

Rulemaking No.: 20-11-003
Exhibit No.: _____
Witnesses: Jeff Billinton &
Abdulrahman Mohammed-Ali
ALJ: Stevens & Thomas
Commissioner: Batjer

Order Instituting Rulemaking to Establish
Policies, Processes, and Rules to Ensure
Reliable Electric Service in California in the
Event of an Extreme Weather Event in 2021

Rulemaking 20-11-003

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

September 1, 2021

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1 **I. INTRODUCTION**

2 The California Independent System Operator Corporation (CAISO) provides two
3 proposals for the Commission’s consideration. Specifically, the CAISO recommends the
4 Commission:

- 5 (1) set an additional system resource adequacy requirement to meet the 8:00 p.m.
6 demand with an appropriate reserve margin; and
- 7 (2) increase the existing planning reserve margin at a minimum from 15% to 17.5% with
8 consideration being given to increase to 20%.

9 The CAISO discusses the need for these changes and implementation options in the sections
10 below.

11 **II. BACKGROUND**

12 In its November 2020 opening comments in this proceeding, the CAISO recommended
13 the Commission “apply the [planning reserve margin] to both the gross peak as well as the most
14 critical hour after peak when solar production is very low or zero.”¹ The CAISO also
15 recommended the Commission increase its planning reserve margin from 15% to 17.5% to
16 address increasing reserve needs. The CAISO subsequently provided data showing the current
17 resource adequacy program creates a structural deficiency during the critical hours after peak by
18 assuming resources available at the demand peak will also be available during other hours of the
19 day. The CAISO forecasted that 2021 resource adequacy showings would be insufficient to
20 provide adequate resources to meet demand plus planning reserve requirements at 8:00 p.m. The
21 Commission ultimately directed investor-owned utilities to target incremental procurement in
22 excess of the 15% planning reserve margin, but it did not modify system resource adequacy
23 requirements.²

24 The summer 2021 resource adequacy showings of load serving entities (LSEs) did not
25 provide sufficient resources to meet 8:00 p.m. hour demand plus a 15% planning reserve margin.
26 Based on these showings and other factors, Commission President Marybel Batjer and California
27 Energy Commission (CEC) Chair David Hochschild sent the CAISO a joint letter requesting the

¹ November 30, 2020 CAISO, Comments
² Commission Decision (D.) 21-03-056, p. 44.

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1 CAISO to exercise its tariff-based capacity procurement mechanism (CPM) authority to procure
2 additional capacity for summer 2021.³ After determining that the substantial changes in the
3 variables underlying the state’s summer resource adequacy planning assumptions constituted a
4 significant event, the CAISO issued a CPM solicitation on July 1, 2021.

5 **III. CAISO PROPOSAL NO. 1 – SETTING AN ADDITIONAL SYSTEM RESOURCE**
6 **ADEQUACY REQUIREMENT TO MEET 8:00 P.M. DEMAND**

7 **A. Proposal Summary**

8 The CAISO recommends the Commission set system resource adequacy requirements to
9 meet demand and the planning reserve margin at 8:00 p.m. for June through October. This
10 requirement should be in addition to—not a replacement for—the current system resource
11 adequacy requirement, which is based on the gross monthly peak. Resource adequacy showings
12 and grid conditions during summer 2021 show there is a need for additional resources during the
13 net demand peak period, especially during summer months. The 8:00 p.m. hour serves as a
14 proxy for the net demand peak period. By also setting a system resource adequacy requirement
15 based on 8:00 p.m. demand, the Commission can ensure its LSEs have appropriate incentive to
16 procure and show resources to meet the critical net demand peak.

17 **B. Discussion**

18 In this section, the CAISO demonstrates the critical need to add a system resource
19 adequacy requirement that LSEs procure sufficient resources to meet demand and reserve margin
20 at 8:00 p.m. The existing system resource adequacy requirement based on gross peak demand is
21 inadequate to ensure the CAISO will have sufficient capacity to maintain reliability during the
22 net demand peak period. In short, 8:00 p.m. serves as a proxy for the critical net demand peak
23 period, when demand is relatively high but resource availability is limited, primarily due to the
24 unavailability of solar resources. Setting resource adequacy requirements to meet demand and
25 the reserve margin at 8:00 p.m. will incent LSEs to procure sufficient resources to meet system
26 needs during this critical period.

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³ See “Joint Statement from the CPUC President Marybel Batjer, CEC Chair David Hochschild, and California ISO CEO Elliot Mainzer on decision to procure additional energy resources for summer,” <http://www.caiso.com/Documents/CapacityProcurementMechanismSignificantEvent-JointStatementandLetter.pdf>.

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1 **1. Critical Grid Needs Extend Beyond the Gross Peak Hour.**

2 Currently, the Commission sets system resource adequacy procurement requirements to
3 meet the monthly gross peak demand plus a 15% planning reserve margin. After investigating
4 the summer 2020 outages, the Commission, CAISO, and CEC jointly issued the Final Root
5 Cause Analysis, which noted this “single critical period of peak demand is giving way to
6 multiple critical periods during the day, including the net demand peak, which is the peak of load
7 net of solar and wind generation resources.”⁴ The Final Root Cause Analysis recognized that
8 “solar is typically under-valued during the peak but overvalued later in the evening after
9 sunset.”⁵

10 The CEC’s load forecast shows that during summer months, demand levels remain high
11 during the hours following the gross peak. Table 1 below shows this relationship.⁶ In July and
12 August 2021, the load forecast for hour ending 8:00 p.m. Pacific Daylight Time (PDT) is only
13 about 1,000 MW lower than the monthly peak, which occurs an hour or two earlier. For May,
14 June, September, and October, the difference is much smaller. In other words, the load at
15 8:00 p.m. is relatively unchanged from the peak (approximately 97% to 99% of the gross peak
16 demand) even though there is a significant decline in solar generation.

⁴ California Independent System Operator, California Public Utilities Commission, California Energy Commission, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* (FRCA), January 13, 2021, p. 43.

⁵ *Id.*, p. 44.

⁶ California Energy Commission, California Energy Demand Update. Forecast, 2020-2030 (CEDU 2020), 2020 Hourly Forecast Update – CAISO Mid-Mid Scenario, as adopted in the 2020 Integrated Energy Policy Report (IEPR).

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1 **Table 1: Comparison of May-October 2021 Peak Demand and Load for HE 8 p.m. PDT⁷**

Month	Peak demand (MW)	Peak demand hour ending (PDT)	8:00 p.m. demand (MW)	Difference between peak hour and 8:00 p.m. demand (MW) ([B] - [D])	8:00 p.m. to peak load ratio ([D] / [B])
[A]	[B]	[C]	[D]	[E]	[F]
May	35,829	7:00 p.m.	35,719	110	99.69%
June	40,974	7:00 p.m.	40,704	270	99.34%
July	44,498	6:00 p.m.	43,112	1,386	96.89%
August	44,746	6:00 p.m.	43,579	1,167	97.39%
September	45,314	6:00 p.m.	44,969	345	99.24%
October	36,631	7:00 p.m.	36,620	11	99.97%

2
3 However, data shows that solar resources produce little to no generation during the hour ending
4 8:00 p.m. Figure 1 below shows actual renewable generation in the CAISO market on a
5 representative day from August 2021. This figure shows solar generation declining from a peak
6 production of more than 11,000 MW (an effective load carrying capability value of
7 approximately 3,000 MW) to effectively 0 MW by 8:00 p.m. PDT. A similar pattern occurs
8 from June through October.⁸

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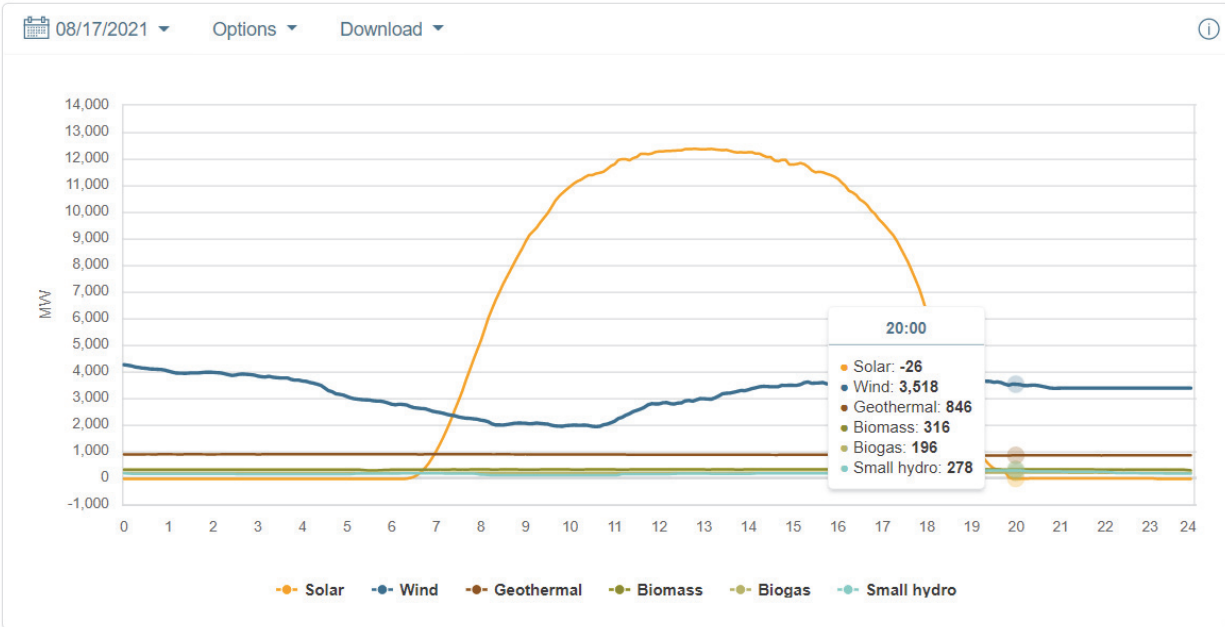
⁷ California Energy Commission, California Energy Demand Update. Forecast, 2020-2030 (CEDU 2020), as adopted in the 2020 Integrated Energy Policy Report (IEPR). Data in the CEDU is based on Pacific Standard Time.

⁸ See January 11, 2021 Prepared Testimony of Jeff Billinton on Behalf of the CAISO, pp. 7-8 for details.

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**Figure 1
Mid-Month Snapshot of Renewable Generation in CAISO Footprint August 2021**



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5 The material drop in solar generation at 8:00 p.m., combined with little or no reduction in load
6 level, necessitates setting system resource adequacy requirements to meet the 8:00 p.m. demand
7 with an appropriate reserve margin. Stated differently the drop in solar production from gross
8 peak to net demand peak far outpaces the drop in load during this period. Given the large
9 number of MW from solar resources typically reflected in monthly resource adequacy plans,
10 setting resource adequacy requirements based solely on gross peak demand essentially “builds
11 in” a capacity shortfall for meeting demand and the planning reserve margin during the net
12 demand peak period. Starting from this disadvantaged position makes it even more difficult for
13 the CAISO to serve load, meet operating reserve requirements, and maintain reliability during
14 the net demand peak period.

15 **2. 2021 Resource Adequacy Showings Demonstrate the Current System**
16 **Resource Adequacy Framework Creates a Structural Resource Adequacy**
17 **Deficiency During Net Peak Demand Period.**

18 Despite Commission direction for LSEs to procure resources capable of producing during
19 the net peak demand period in D.21-03-056, 2021 resource adequacy showings demonstrate that
20 resource adequacy requirements set to meet gross peak needs creates a significant structural

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1 resource deficiency during the net demand peak. In particular, the resource adequacy showings
2 for June, July, August, and September 2021, which are based on monthly gross peak load,
3 provided effective resources significantly lower than the level necessary to maintain a 15%
4 planning reserve margin at 8:00 p.m. The CAISO also provides data for May 2021, though it
5 only recommends adopting the new 8:00 p.m. resource adequacy requirements for June through
6 September for 2022. The CAISO also recommends adopting 8:00 p.m. resource adequacy
7 requirements for all months starting in 2023.

8 Table 2 below provides a simplified calculation of the actual 2021 implied planning
9 reserve margin for resource adequacy showings based on the current resource adequacy
10 obligation at peak.⁹ The analysis assumes a uniform 15% planning reserve margin for all local
11 regulatory authorities across the CAISO footprint, which is slightly higher than the 14.9% actual
12 aggregated planning reserve margin.¹⁰ Column [B] reflects the CEC-adjusted peak load forecast
13 provided by CEC staff on a monthly basis¹¹ and then grossed up by the uniform 15% planning
14 reserve margin in column [C]. Column [D] reflects all of the capacity shown to the CAISO on
15 supply plans to meet resource adequacy obligations, including imports. Credits reflect those that
16 are provided by local regulatory authorities (including credits that are subsequently grossed up
17 for the planning reserve margin) as well as credits provided by the CAISO for reliability-must-
18 run and capacity procurement mechanism (CPM) designated capacity.¹² Table 2 does not reflect
19 any CPM capacity because no such capacity was designated prior to the CAISO's recent
20 Significant Event CPM designations to address the capacity shortfall in summer 2021. Lastly,
21 column [E] calculates the monthly implied planning reserve margin to meet the peak obligation.
22 September 2021 shows a clear deficient at peak with an implied planning reserve margin of only
23 14.0%.

24

⁹ October 2021 resource adequacy showings were not available at the time of publication of this testimony.

¹⁰ FRCA, p. 49.

¹¹ System RA is "Each LSEs CEC-adjusted forecast plus a 15% planning reserve margin." See:

<https://www.cpuc.ca.gov/ra>

¹² To simplify the analysis, credits are shown as supply in Table 2. However, in the CAISO system, credits reduce the resource adequacy obligation. The end result does not differ under either methodology.

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**Table 2
Implied Planning Reserve Margin (PRM) of May-September 2021 Resource Adequacy
Showings and Credits Based on Gross Peak Obligation Across the CAISO Footprint**

Month	CEC-Adjusted Peak Load Forecast (MW)	CEC-Adjusted Peak Load Forecast Plus 15% PRM (MW) [B] x 1.15	Total Resource Adequacy Capacity Shown to CAISO plus Credits (MW)	Implied PRM at Peak Obligation ([D]/[B])-1
[A]	[B]	[C]	[D]	[E]
May	35,829	41,203	41,941	17%
June	40,629	46,723	47,918	18%
July	43,517	50,045	51,394	18%
August	43,752	50,315	50,258	15%
September	44,176	50,802	50,344	14%

6

7 Table 3 below provides an illustrative calculation of the actual 2021 implied planning
8 reserve margin from 2021 resource adequacy showings based on a 15% planning reserve margin
9 at 8:00 p.m.¹³ Column [B] reflects the aggregated system-wide CEC-adjusted 8:00 p.m. load
10 forecast for June through September 2021, after applying the 8:00 p.m. to peak load ratio from
11 Table 1 (column [F]). Column [C] applies the current 15% planning reserve margin. Column
12 [D] reflects all of the capacity shown to the CAISO on supply plans to meet resource adequacy
13 obligations, including imports, plus credits but net of solar. This illustrative example assumes all
14 solar is removed from the supply stack given that there is little to no generation. Column [E]
15 illustrates the difference between the 8:00 p.m. requirement and the total resource adequacy
16 showings for 8:00 p.m. based on today's 15% planning reserve margin. The negative numbers
17 indicate procurement shortfalls at 8:00 p.m. Lastly, column [F] calculates the implied planning
18 reserve margin of showings at 8:00 p.m., which ranges from 10% to 12% but does not meet the
19 current 15% requirement.

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¹³ October 2021 resource adequacy showings were not available at the time of publication of this testimony.

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Table 3: Implied Planning Reserve Margin (PRM) of May-September 2021 Eligible Resource Adequacy Showings and Credits at Illustrative 8:00 p.m. Obligation Across CAISO Footprint

Month	8:00 p.m. load (MW)	8:00 p.m. obligation based on 15% PRM (MW)	Total Resource Adequacy Capacity Shown to CAISO plus Credits, Net of Solar 8:00 p.m. (MW)	Resource deficiency at 8:00 p.m. for 15% PRM [D]-[C]	Implied PRM at 8:00 p.m. ([D]/[B])-1
[A]	[B]	[C]	[D]	[E]	[F]
May	35,720	41,077	40,106	(972)	12%
June	40,362	46,416	44,552	(1,864)	10%
July	42,162	48,486	46,671	(1,815)	11%
August	42,611	49,002	47,051	(1,951)	10%
September	43,839	50,415	48,649	(1,766)	11%

This data shows that setting system resource adequacy requirements only to meet the gross peak demand with the existing 15% planning reserve margin results in woefully inadequate resource adequacy at 8:00 p.m. The current resource adequacy paradigm “builds in” a structural capacity deficiency at 8:00 by requiring load serving entities only to procure to the gross peak demand and counting solar resources. The resources procured are insufficient to provide a 15% reserve margin at 8:00 p.m. Procuring to the 15% reserve margin based on the gross peak demand provides a reserve margin ranging from only 10 to 12% at the 8:00 p.m. hour during the summer months. This procurement level is insufficient to meet demand and account for potential outages, extreme weather, and contingency reserve requirements.

This insufficiency was identified in the events of August 2020 as well as this summer, which resulted in the CAISO having to take extreme efforts to find sufficient capacity on multiple occasions to serve load during net peak. Based on system conditions this summer and the urging of the state energy agencies,¹⁴ the CAISO triggered its capacity procurement mechanism (CPM) to address the net peak capacity insufficiencies. These known insufficiencies should be planned for and waiting to procure needed capacity is not prudent for maintaining

¹⁴ See “Joint Statement from the CPUC President Marybel Batjer, CEC Chair David Hochschild, and California ISO CEO Elliot Mainzer on decision to procure additional energy resources for summer,” <http://www.caiso.com/Documents/CapacityProcurementMechanismSignificantEvent-JointStatementandLetter.pdf>.

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1 system reliability and avoiding curtailments. Under these circumstances, waiting to procure
2 capacity until the problem is imminent can be also be highly problematic as there may be limited
3 capacity available when needed.

4 The Commission should address this issue in advance and remedy the structural
5 deficiency up front by requiring load serving entities to meet system resource adequacy
6 requirements for resources sufficient to meet demand and reserve margin requirements at
7 8:00 p.m. For 2021, the CAISO recommends instituting the additional resource adequacy
8 requirements for only the June through September monthly showings. However, CAISO
9 showing data for May 2021 shows a similar pattern to the summer months. The CAISO
10 recommends adopting 8:00 p.m. system resource adequacy requirements for all months
11 beginning in 2023.

12 **3. The Commission Should Not Delay Adopting 8:00 p.m. System Resource**
13 **Adequacy Requirements Due to a Potential Lack of Available Resources.**

14 In D.21-03-056 the Commission declined to adopt a higher planning reserve margin
15 based, in part, on its finding regarding “the tightness of the market” at that time.¹⁵ The capacity
16 market remains tight, but this should not prevent the Commission from adopting system resource
17 adequacy requirements to meet the 8:00 p.m. demand. The Commission should begin directing
18 its load serving entities to procure resources to meet the net demand peak period. The current
19 system resource adequacy requirements do not set appropriate targets for load serving entity
20 procurement. Also, as discussed above, if there is limited capacity, it is more prudent to seek to
21 secure it in advance than to wait until the problem is at hand—at which point the capacity that is
22 available will be more limited because others have procured it in advance.

23 **C. Implementation**

24 In this section, the CAISO details how the Commission can implement its proposal.
25 Before explaining its proposed implementation plan, the CAISO reiterates that the Commission
26 should retain its current process for establishing system monthly resource adequacy requirements
27 at the gross peak hour and validating load serving entity compliance. The Commission should
28 also retain its current processes for establishing and enforcing local and flexible resource
29 adequacy requirements.

¹⁵ D.21-03-056, p. 43.

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1 The CAISO proposes an additional process to establish system resource adequacy
2 requirements at the 8:00 p.m. hour and provides a methodology for determining load and supply
3 at this later hour. Below, the CAISO provides implementation details regarding how to establish
4 LSE demand forecasts and supply for the 8:00 p.m. hour. The CAISO also provides other
5 relevant implementation details.

6 **1. Proposed Methodology for LSE-Specific Demand Forecasts for 8:00 p.m.**

7 Currently, the CEC provides individual LSE monthly peak load forecasts for use in the
8 resource adequacy program.¹⁶ The CEC has not developed individual LSE monthly load
9 forecasts at the 8:00 p.m. hour. To implement the proposal, the Commission should use the
10 system hourly load forecast from the CEC’s Integrated Energy Policy Report (IEPR), using the
11 same scenario as the resource adequacy program.¹⁷ The Commission can then use this hourly
12 load forecast to determine the ratio between the load at 8:00 p.m. on the monthly peak day and
13 the monthly peak hour, as reflected in Table 1.¹⁸ The Commission should apply each monthly
14 ratio to the CEC-provided LSE monthly peak loads to derive the LSE-specific 8:00 p.m. load.¹⁹
15 Once the Commission has developed the monthly 8:00 p.m. load by jurisdictional LSE, the
16 Commission should apply the adopted planning reserve margin (17.5% as proposed by the
17 CAISO) to derive the resource adequacy obligation at 8:00 p.m.

¹⁶ System RA is “Each LSEs CEC-adjusted forecast plus a 15% planning reserve margin.” *See*:

<https://www.cpuc.ca.gov/ra>

¹⁷ California Energy Commission, Final 2020 Integrated Energy Policy Report Update, Volume III: California Energy Demand Forecast Update, 2021, p. 21. The report states:

“The following list describes the current agreement among the joint agencies’ respective staff and California ISO leadership...CPUC resource adequacy LSE system requirements: Baseline mid-case monthly peak demand derived from mid-case hourly loads, AAEE mid-mid annual and monthly peak demand, 1-year-in-2 peak event weather conditions.”

¹⁸ The CAISO refers to this ratio as the “8:00 p.m. to Peak Load Ratio” in column [F] in Table 1 above. Table 1 data is from the CEC’s most recently adopted hourly forecast for the CAISO system, the same vintage as the resource adequacy program used in 2020 as the foundation to develop the 2021 resource adequacy requirements, and further refined by CEC staff on a monthly basis. California Energy Commission, California Energy Demand Forecast Update, 2020 Hourly Forecast Update- CAISO Mid Demand – Mid Additional Achievable Energy Efficiency scenario, 2021. Available here: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=20-IEPR-03>

¹⁹ Alternatively, the CEC could calculate the ratio and apply it to the CEC-adjusted monthly load forecast uniformly across all LSEs in the CAISO footprint.

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1 **2. Proposed Methodology for Determining Eligible Supply for 8:00 p.m.**
2 **Obligation**

3 As a simplifying assumption, the CAISO proposes to remove all stand-alone and co-
4 located solar²⁰ from the supply stack given that there is little to no solar generation at 8:00 p.m.
5 Co-located solar resources are not different than standalone solar resources for resource
6 adequacy purposes as the solar resource has its own resource ID in the CAISO market and is
7 dispatched separately from storage resources that may be located nearby. Solar paired with
8 storage in a hybrid configuration using a single resource ID in the CAISO market should remain
9 in the supply stack. This simplifying assumption would not apply for the gross peak resource
10 adequacy requirement. All other resources can remain in the supply stack using the same gross
11 peak counting methodologies.

12 **3. Proposed Validation and Application of CAISO Proposal**

13 The CAISO proposes the Commission adopt a validation process for the 8:00 p.m.
14 resource adequacy obligation similar to the current peak obligation. This may include enhancing
15 current or developing similar templates for load serving entities to show compliance and the
16 application of penalties for failure to comply. The CAISO commits to developing a similar
17 process to validate resource adequacy showings at 8:00 p.m. and looks forward to coordinating
18 with Commission Energy Division staff and scheduling coordinators to leverage currently
19 provided data to minimize the need for incremental work.

20 For resource adequacy year 2022, the CAISO proposes the 8:00 p.m. obligation to only
21 apply on a monthly basis from June through October. Because the final decision in this
22 proceeding is not scheduled to be voted on until after the year-ahead obligations are due, the
23 CAISO proposes that the Commission only apply the new 8:00 p.m. obligation during the
24 monthly showing period.

25 For resource adequacy year 2023, the Commission should apply this obligation, at
26 minimum, to the months June through October but preferably the entire year.

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²⁰ For example, solar resources co-located with storage and registered in the CAISO market under separate solar and storage resource IDs.

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1 **IV. CAISO PROPOSAL NO. 2. – INCREASING THE PLANNING RESERVE**
2 **MARGIN**

3 **A. Proposal Summary**

4 The Commission should increase the planning reserve margin from 15% to 17.5% to
5 account for forced outages and the increased potential for extreme weather events.

6 **B. Discussion**

7 The Commission established the current 15% planning reserve margin in 2004 under
8 Assembly Bill 380 (Statutes of 2005) and has not revised the margin since.²¹ The 15% planning
9 reserve margin accounts for Western Electricity Coordinating Council (WECC)-required grid
10 operating contingency reserves (at 6%) and accounts for forced outages and demand variability
11 (at 9%).²² However, the current construct is inconsistent with the performance of the evolving
12 resource fleet and changing climate conditions. The Commission should increase the planning
13 reserve margin to align with industry observed forced outage rates and the potential for extreme
14 weather events, which are becoming more common.

15 Both forced outage data and the future risk of extreme weather events support increasing
16 the planning reserve margin. NERC Generator Availability Data System (GADS) data show a
17 7.2% industry forced outage rate.²³ The CAISO discussed this data in detail in its January 11,
18 2021 testimony in this proceeding. The GADS forced outage rate is a reasonable industry
19 accepted measure of expected forced outages and the CAISO recommends that a 7.5% forced
20 outage rate be used to allow for a more appropriate amount of expected forced outages.

21 In addition, the Commission should reconsider the planning reserve margin to account for
22 higher than average demand that could result from extreme weather events. The Commission
23 uses the CEC's 1-in-2 demand forecast with some reserve for weather variability in determining
24 the 15% planning reserve margin. In earlier testimony in this proceeding, the CAISO
25 recommended using a 1-in-5 demand forecast, which is about 4% higher than the 1-in-2 forecast,

²¹ FCRA, p.42.

²² CAISO, Opening Testimony of Jeff Billinton, *Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021*, R.20-11-003, January 11, 2021, pp. 2-3. <http://www.caiso.com/Documents/Jan11-2021-OpeningTestimony-JeffBillinton-ReliableElectricService-ExtremeWeatherEvent-R20-11-003.pdf>

²³ NERC - General Availability Review (Weighted EFOR) Dashboard, www.nerc.com/pa/RAPA/Pages/GeneralAvailabilityReview.aspx

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1 to account for higher than average demand. Recent data suggests that even accounting for
2 demand variability to address a 1-in-5 demand forecast is overly conservative and may need to
3 be revisited to consider whether allowance for 1-in-5 is truly sufficient. Accounting for load
4 variability for an allowance of a 1-in-10 forecast would result in 6.5%, being the difference
5 between 1-in-2 forecast and the 1-in-10 forecast, as opposed to the 4% identified above. The
6 CEC recently conducted a preliminary summer 2022 supply stack analysis “to better inform the
7 public about potential implications if the 2021 California drought and western extreme heat
8 events persist into summer 2022, as current National Oceanic and Atmospheric Administration
9 models predict.”²⁴ The CEC conducted its analysis with 9% to account for demand variability.
10 This 9% accounting for demand variability is equivalent to a greater than 1-in-10 weather
11 event.²⁵

12 The CAISO also notes recent heat events have surpassed the 1-in-5 weather levels. The
13 CAISO found the August 2020 heatwave ranked as a 1-in-9.3 weather event in the CAISO
14 balancing authority area.^{26 27} Similarly, the CAISO summer 2017 peak demand was higher than
15 the 1-in-10 demand forecast.²⁸ This data supports adjusting the planning reserve upward to
16 address the potential for future extreme weather events, which are becoming more common.

17 Based on the industry observed forced outage data and the need to plan for increasingly
18 extreme weather events, the CAISO recommends at a minimum increasing the planning reserve
19 margin from 15% to 17.5% with further consideration of increasing to 20% accounting for load
20 variability to the 1-in-10 forecast. This modification is conservative in light of the data, but it
21 would incrementally improve system reliability until more CAISO-specific forced outage data is
22 available and further assessment of whether the to account for higher demand variability as
23 indicated by the CEC.

24

²⁴ CEC, p. 2.

²⁵ California Energy Commission Preliminary 2022 Summer Supply Stack Analysis, August 12, 2021. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=239251>

²⁶ CAISO 2021 Summer Loads and Resources Assessment, p. 19.

²⁷ The west wide weather event was higher than the 1-in-9.3 observed in the CAISO BAA.

²⁸ The Department of Market Monitoring at the CAISO, *2020 Annual Report on Market Issues and Performance, August 2021*, p. 31. Available at: <http://www.caiso.com/Documents/2020-Annual-Report-on-Market-Issues-and-Performance.pdf>

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1 **C. Implementation**

2 The Commission can adjust the planning reserve margin relatively easily as
3 recommended by the CAISO. The CAISO does not expect this proposal would require
4 substantive changes from current practices. The CAISO's current systems can accommodate a
5 higher planning reserve margin.

6

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
R.20-11-003**

1 **Attachment A - Statement of Qualifications & Prepared Testimony of Jeff Billinton**

2

3 **Q. Please state your name and business address for the record.**

4 **A. Jeff Billinton, 250 Outcropping Way, Folsom, California.**

5 **Q. Briefly describe your present responsibilities at the California Independent System**
6 **Operator Corporation (CAISO).**

7 **A. I am currently employed as the Director of Transmission Infrastructure Planning.**

8 **Q. Briefly describe your educational and professional background.**

9 **A. I received a Bachelor of Science degree in Electrical Engineering at the University of**
10 **Saskatchewan, Canada. I have over 30 years of experience in the electric utility industry**
11 **in distribution and transmission system design, construction, operations, and planning.**

12 **Q. What is the purpose of your testimony in this proceeding?**

13 **A. The purpose of my testimony in this proceeding is to sponsor Section I through III.B and**
14 **Section IV.A through IV.B of the CAISO's September 1, 2021 Testimony.**

15 **Q. Was this material prepared by you or under your supervision?**

16 **A. Yes, it was.**

17 **Q. Insofar as this material is factual in nature, do you believe it to be correct?**

18 **A. Yes, I do.**

19 **Q. Insofar as this material is in the nature of opinion or judgment, does it represent**
20 **your best judgment?**

21 **A. Yes, it does.**

22 **Q. Do you adopt this testimony as your sworn testimony in this proceeding?**

23 **A. Yes, I do.**

24 **Q. Does this conclude your qualifications and prepared testimony?**

25 **A. Yes, it does.**

26

