OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

September 1, 2021
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I. INTRODUCTION

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

(1) set an additional system resource adequacy requirement to meet the 8:00 p.m. demand with an appropriate reserve margin; and

(2) increase the existing planning reserve margin at a minimum from 15% to 17.5% with consideration being given to increase to 20%.

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

II. BACKGROUND

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

The summer 2021 resource adequacy showings of load serving entities (LSEs) did not provide sufficient resources to meet 8:00 p.m. hour demand plus a 15% planning reserve margin. Based on these showings and other factors, Commission President Marybel Batjer and California 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.
CAISO to exercise its tariff-based capacity procurement mechanism (CPM) authority to procure additional capacity for summer 2021.\textsuperscript{3} After determining that the substantial changes in the variables underlying the state’s summer resource adequacy planning assumptions constituted a significant event, the CAISO issued a CPM solicitation on July 1, 2021.

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

A. Proposal Summary

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

B. Discussion

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

\textsuperscript{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.
1. Critical Grid Needs Extend Beyond the Gross Peak Hour.

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

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

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\(^5\) Id., p. 44.

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

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

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

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8 See January 11, 2021 Prepared Testimony of Jeff Billinton on Behalf of the CAISO, pp. 7-8 for details.
The material drop in solar generation at 8:00 p.m., combined with little or no reduction in load level, necessitates setting system resource adequacy requirements to meet the 8:00 p.m. demand with an appropriate reserve margin. Stated differently, the drop in solar production from gross peak to net demand peak far outpaces the drop in load during this period. Given the large number of MW from solar resources typically reflected in monthly resource adequacy plans, setting resource adequacy requirements based solely on gross peak demand essentially “builds in” a capacity shortfall for meeting demand and the planning reserve margin during the net demand peak period. Starting from this disadvantaged position makes it even more difficult for the CAISO to serve load, meet operating reserve requirements, and maintain reliability during the net demand peak period.


Despite Commission direction for LSEs to procure resources capable of producing during the net peak demand period in D.21-03-056, 2021 resource adequacy showings demonstrate that resource adequacy requirements set to meet gross peak needs creates a significant structural
resource deficiency during the net demand peak. In particular, the resource adequacy showings
for June, July, August, and September 2021, which are based on monthly gross peak load,
provided effective resources significantly lower than the level necessary to maintain a 15%
planning reserve margin at 8:00 p.m. The CAISO also provides data for May 2021, though it
only recommends adopting the new 8:00 p.m. resource adequacy requirements for June through
September for 2022. The CAISO also recommends adopting 8:00 p.m. resource adequacy
requirements for all months starting in 2023.

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

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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.
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

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

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

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

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

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, 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

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

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

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

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

C. Implementation

In this section, the CAISO details how the Commission can implement its proposal.

Before explaining its proposed implementation plan, the CAISO reiterates that the Commission
should retain its current process for establishing system monthly resource adequacy requirements
at the gross peak hour and validating load serving entity compliance. The Commission should
also retain its current processes for establishing and enforcing local and flexible resource
adequacy requirements.

15 D.21-03-056, p. 43.
The CAISO proposes an additional process to establish system resource adequacy requirements at the 8:00 p.m. hour and provides a methodology for determining load and supply at this later hour. Below, the CAISO provides implementation details regarding how to establish LSE demand forecasts and supply for the 8:00 p.m. hour. The CAISO also provides other relevant implementation details.

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

Currently, the CEC provides individual LSE monthly peak load forecasts for use in the resource adequacy program. The CEC has not developed individual LSE monthly load forecasts at the 8:00 p.m. hour. To implement the proposal, the Commission should use the system hourly load forecast from the CEC’s Integrated Energy Policy Report (IEPR), using the same scenario as the resource adequacy program. The Commission can then use this hourly load forecast to determine the ratio between the load at 8:00 p.m. on the monthly peak day and the monthly peak hour, as reflected in Table 1. The Commission should apply each monthly ratio to the CEC-provided LSE monthly peak loads to derive the LSE-specific 8:00 p.m. load.

Once the Commission has developed the monthly 8:00 p.m. load by jurisdictional LSE, the Commission should apply the adopted planning reserve margin (17.5% as proposed by the CAISO) to derive the resource adequacy obligation at 8:00 p.m.

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16 System RA is “Each LSEs CEC-adjusted forecast plus a 15% planning reserve margin.” See: https://www.cpuc.ca.gov/ra


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

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

3. Proposed Validation and Application of CAISO Proposal

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

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

For resource adequacy year 2023, the Commission should apply this obligation, at 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.
IV. CAISO PROPOSAL NO. 2. – INCREASING THE PLANNING RESERVE MARGIN

A. Proposal Summary

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

B. Discussion

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

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

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

\(^{21}\) FCRA, p.42.
\(^{23}\) NERC - General Availability Review (Weighted EFOR) Dashboard, [www.nerc.com/pa/RAPA/Pages/GeneralAvailabilityReview.aspx](http://www.nerc.com/pa/RAPA/Pages/GeneralAvailabilityReview.aspx)
to account for higher than average demand. Recent data suggests that even accounting for
demand variability to address a 1-in-5 demand forecast is overly conservative and may need to
be revisited to consider whether allowance for 1-in-5 is truly sufficient. Accounting for load
variability for an allowance of a 1-in-10 forecast would result in 6.5%, being the difference
between 1-in-2 forecast and the 1-in-10 forecast, as opposed to the 4% identified above. The
CEC recently conducted a preliminary summer 2022 supply stack analysis “to better inform the
public about potential implications if the 2021 California drought and western extreme heat
events persist into summer 2022, as current National Oceanic and Atmospheric Administration
models predict.”24 The CEC conducted its analysis with 9% to account for demand variability.
This 9% accounting for demand variability is equivalent to a greater than 1-in-10 weather
event.25

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

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

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24 CEC, p. 2.
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.
C. Implementation

The Commission can adjust the planning reserve margin relatively easily as recommended by the CAISO. The CAISO does not expect this proposal would require substantive changes from current practices. The CAISO's current systems can accommodate a higher planning reserve margin.
Q. Please state your name and business address for the record.
A. Jeff Billinton, 250 Outcropping Way, Folsom, California.

Q. Briefly describe your present responsibilities at the California Independent System Operator Corporation (CAISO).
A. I am currently employed as the Director of Transmission Infrastructure Planning.

Q. Briefly describe your educational and professional background.
A. I received a Bachelor of Science degree in Electrical Engineering at the University of Saskatchewan, Canada. I have over 30 years of experience in the electric utility industry in distribution and transmission system design, construction, operations, and planning.

Q. What is the purpose of your testimony in this proceeding?
A. The purpose of my testimony in this proceeding is to sponsor Section I through III.B and Section IV.A through IV.B of the CAISO’s September 1, 2021 Testimony.

Q. Was this material prepared by you or under your supervision?
A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?
A. Yes, I do.

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

Q. Do you adopt this testimony as your sworn testimony in this proceeding?
A. Yes, I do.

Q. Does this conclude your qualifications and prepared testimony?
A. Yes, it does.
Q. Please state your name and business address for the record.
A. Abdulrahman Mohammed-Ali, 250 Outcropping Way, Folsom, California.

Q. Briefly describe your present responsibilities at the California Independent System Operator Corporation (CAISO).
A. I am currently employed with the CAISO as a Resource Management Specialist Lead.

Q. Briefly describe your educational and professional background.
A. I received a Bachelor of Engineering degree in Electrical Engineering at the University of Minnesota and a Master of Business Administration at the California State University in Sacramento. I have over 12 years of experience in the electric utility industry including work in planning, operations, markets, and resource adequacy.

Q. What is the purpose of your testimony in this proceeding?
A. The purpose of my testimony in this proceeding is to sponsor Section III.C and Section IV.C of the CAISO’s September 1, 2021 Testimony.

Q. Was this material prepared by you or under your supervision?
A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?
A. Yes, I do.

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

Q. Do you adopt this testimony as your sworn testimony in this proceeding?
A. Yes, I do.

Q. Does this conclude your qualifications and prepared testimony?
A. Yes, it does.