

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Oversee the
Resource Adequacy Program, Consider
Program Reforms and Refinements, and
Establish Forward Resource Adequacy
Procurement Obligations.

Rulemaking 21-10-002
(Filed October 7, 2021)

**OPENING COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION ON PROPOSED DECISION ON PHASE 2 OF THE
RESOURCE ADEQUACY REFORM TRACK**

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I. Introduction

Pursuant to Rule 14.3 of the California Public Utilities Commission’s (Commission) Rules of Practice and Procedure, the California Independent System Operator Corporation (CAISO) submits comments on the *Proposed Decision on Phase 2 of the Resource Adequacy Reform Track* (PD), issued on March 3, 2023.

The CAISO’s comments focus on the process for setting the planning reserve margin (PRM) under the Slice of Day framework, the proposed exceedance methodology for wind and solar resources, and the proposed qualifying capacity (QC) values for use in CAISO processes. The CAISO urges the Commission to clarify, in advance of the test year, how it will select and test the PRM under the Slice of Day framework. The Commission should also commit to test and re-evaluate other PRM approaches this year, given limited evidence that a single annual PRM approach will produce a portfolio that meets a 1 in 10 loss of load expectation (LOLE). Finally, the CAISO urges the Commission to re-evaluate wind and solar exceedance approaches and the values proposed for use in CAISO processes after experience with the test year.

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II. Discussion

A. The Commission Should Clarify in Advance of the Test Year How it Will Select and Test the PRM Under the Slice of Day Framework and Commit to Re-Evaluate a Single Annual PRM Approach.

1. The Commission Should Clarify How it Will Select the Single Annual PRM in Advance of the Test Year.

The PD adopts a single annual PRM under the Slice of Day framework.¹ However, the PD provides no detail on how the single annual PRM will be selected and tested to ensure a reliable portfolio, and the PD does not explain how a single annual PRM will ensure resource adequacy requirements meet a 1 in 10 LOLE target. In order for parties to determine whether a single annual PRM approach is sufficient to maintain a 1 in 10 LOLE target, the Commission should clarify how it will select and test the single annual PRM in advance of the test year. The Commission should also explicitly state that a 1 in 10 LOLE standard should be the minimum goal for the resource adequacy program.

The PD indicates the Implementation Track in this proceeding will consider modifications to the PRM for 2024 and beyond.² However, it is unclear at this point how the Commission in the Implementation Track will select a single annual PRM based on an LOLE study. In the Implementation Track, Energy Division suggested an 18 to 20 percent PRM would be “highly reliable” for 2024.³ However, several parties, including the CAISO, expressed concern that there was little opportunity to review Energy Division’s LOLE study in advance of the study’s release, and Energy Division did not provide detail to demonstrate that an 18 to 20 percent PRM would ensure at least a 1 in 10 LOLE.⁴

The Commission should clarify how it will set the PRM under the Slice of Day framework in advance of the 2024 test year. The Commission should also commit to testing the PRM selected for the test year to ensure the PRM under the Slice of Day framework will support

¹ PD, p. 59.

² PD, p. 59.

³ *Energy Division Study for Proceeding R.21-10-002 Loss of Load Expectation and Slice of Day Tool Analysis for 2024*, January 20, 2023, p. 8.

⁴ CAISO Opening Comments on Phase 3 Workshop and Proposals, February 24, 2023, p. 6; Calpine Corporation Opening Comments, p. 1; Middle River Power (MRP) Opening Comments, p. 7; Vistra Corp. Opening Comments, p. 16; Microsoft Corporation Opening Comments, p. 3.

a 1 in 10 LOLE target. Finally, the Commission should allow parties to re-evaluate a single annual PRM approach after this process is completed later this year. The PD notes that other parties supported applying multiple PRMs to the Slice of Day framework, depending on the month or season, but concludes, “There is insufficient record to adopt such proposals at this time.”⁵ The CAISO does not disagree with this conclusion but is concerned that the record is equally void of sufficient information to conclude that a single PRM approach will ensure a 1 in 10 LOLE. As discussed further below, the Commission should re-evaluate this year a single annual PRM approach and allow for further development of the record of other proposals submitted in Track 2.

2. The Commission Should Commit to Stress Test PRM Levels and Re-Evaluate a Single Annual PRM Approach This Year.

In workshops last year, parties discussed extensively options to select the appropriate PRM under the Slice of Day framework. Energy Division staff analysis showed that a single annual PRM based on the peak month introduces additional reliability risk in other months, and it found that other approaches may better ensure resource adequacy requirements meet a 1 in 10 LOLE target.⁶

In addition to not specifying how the Commission will select a single annual PRM, the PD does not adopt additional testing or analysis of a single annual PRM approach, *e.g.*, the stress testing Energy Division presented in workshops last year. Additionally, the PD fails to explain why alternative PRM approaches, such as the Natural Resources Defense Council (NRDC) proposal to increase the PRM for any month with LOLE risk outside of the peak month, are not viable.

Based on analysis presented in workshops and lack of evidence to support a single annual PRM approach in both the PD and in the Implementation Track, the Commission should not conclude that a single annual PRM approach will be sufficient to produce a reliable portfolio in the resource adequacy program. The Commission should commit to additional testing of a single

⁵ PD, p. 59.

⁶ Energy Division, *Slice of Day – Load Forecast Process Update and Loss of Load Studies Translation for RA Proceeding Update*, October 6, 2022: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/resource-adequacy-compliance-materials/resource-adequacy-history/10-6-2022-wrap-up/workshop-10_energy-division_221006.pdf

annual PRM approach before the test year given the limited record and evidence that a single PRM approach will produce a portfolio that meets a 1 in 10 LOLE. The Commission should test whether the expected portfolio shown under the selected PRM level would meet a 1 in 10 LOLE and analyze whether the actual portfolios procured meet a 1 in 10 LOLE (including the set of resources shown in the test year) given the counting rules and the annual PRM values. The Commission should also commit to re-evaluating the single PRM approach and other alternative approaches previously discussed in this proceeding later this year.

B. The Commission Should Re-Evaluate the Proposed Wind and Solar Exceedance Approach After Experience With the Test Year and Consider Interactions With the PRM.

The PD adopts the Public Advocates Office at the California Public Utilities Commission's (Cal Advocates) proposed exceedance methodology, with a modification to the exceedance baseline calculation to include all Flex Alert days.⁷ The CAISO supports including Flex Alert days in the baseline used to determine the exceedance level. The CAISO found that wind and solar production were often very low on some historically stressed system days.

However, the CAISO continues to support more conservative counting approaches for solar and wind resources. The Cal Advocates exceedance approach appears to result in lower exceedance values across the year for wind and solar compared to MRP's and Pacific Gas and Electric Company's (PG&E) proposals.⁸ The CAISO supported MRP's exceedance proposal because it selected an exceedance level that ensured coverage of the baseline in all hours. The Cal Advocates approach, on the other hand, selects the exceedance that matches the baseline on average, resulting in over-counting of wind and solar production compared to the baseline in some critical evening hours.

As the CAISO explained in comments on the Resource Adequacy Reform Workshop Report, the CAISO supports more conservative counting approaches for several reasons.⁹ First,

⁷ PD, p. 32.

⁸ CalPA Comparison of Solar and Wind Proposals, available at: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/resource-adequacy-homepage/resource-adequacy-history>

⁹ CAISO Comments on the Resource Adequacy Reform Workshop Report, December 1, 2022, p. 8: http://www.aiso.com/Documents/Dec1-2022-Comments_ResourceAdequacyReformWorkshopReport_ResourceAdequacyProgram_R21-10-002.pdf

higher exceedance levels can better ensure coverage of renewable production on stressed days. As the CAISO pointed out in the reform workshops last year, more conservative exceedance approaches better ensure coverage when there is very low renewable production on operationally challenging days, *e.g.*, August 14 and 15, 2020 and September 8 and 9, 2022.¹⁰ Second, higher exceedance levels can better account for the drop in solar production in peak hours during the month of August and across evening hours as the sun sets. Lastly, although lower exceedance levels will require higher PRM levels to meet reliability targets, the Commission may not adjust the PRM to make up for the uncertainty that resources will not produce up to counting values due to other factors. For example, the Commission is currently considering the continued use of an “effective” PRM in the Implementation Track instead of increasing the PRM for 2024, in order to address procurement challenges. It may be difficult for the Commission to calibrate further adjustments to account for the relationship between PRM and exceedance values. For these reasons, more conservative counting approaches will better ensure the resource adequacy fleet can meet reliability targets.

The PD fails to explain why Cal Advocates’ method to select the exceedance level, which minimizes the sum of differences between the exceedance level and the baseline across all hours, is superior to other proposals such as MRP’s and PG&E’s proposals. Given the lack of rationale for selecting Cal Advocates’ exceedance approach, the aforementioned benefits of more conservative exceedance values, lack of testing of the approach with the revised baseline for all resource types and locations, and uncertainty about the interaction with the PRM, the Commission should re-evaluate wind and solar exceedance methodologies after experience with the test year. The Commission should reconsider alternative approaches such as MRP’s and PG&E’s proposals that received party support,¹¹ with Flex Alert days added to the exceedance baseline.

¹⁰ CAISO, *Exceedance and Planning Reserve Margin Discussion*, October 6, 2022: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/resource-adequacy-compliance-materials/resource-adequacy-history/10-6-2022-wrap-up/workshop-10_caiso_221006.pdf

¹¹ PG&E Opening Comments on the Resource Adequacy Reform Workshop Report, p. 4; Solar Energy Industries Association Opening Comments, p. 6; AES Clean Energy Development, LLC Opening Comments, p. 3; CAISO Opening Comments, p. 7, MRP Opening Comments, p. 12; Department of Market Monitoring of the CAISO (DMM) Opening Comments, p. 2.

C. Inputs to CAISO Processes

1. The Commission Should Clarify That the Revised QC Value Used as an Input to CAISO Processes Only Applies to Resource Types Whose Counting Approaches Will Change Under Slice of Day.

The PD proposes that after the test year, the Commission will send the CAISO non-zero values for each resource as the basis for the net qualifying capacity (NQC) list and showings, based on the average of resource hourly values across the availability assessment hours (AAH).¹² The PD states, “These nonzero QC values will apply to all resources.”¹³ However, the PD only proposes that wind, solar, and demand response counting methodologies will change to hourly profiles under Slice of Day. Therefore, only wind, solar, and demand response should require a different approach for QC values used in CAISO processes. The Commission should clarify that the revised QC values used for the CAISO NQC list only apply to resource types whose counting approaches will change under Slice of Day: wind, solar, and demand response.

2. The Commission Should Adopt an Alternative Approach for Values Used to Establish the CAISO NQC List.

The CAISO appreciates the Commission’s consideration of the CAISO’s current process and system requirements that QC values be non-zero. However, the initial results of Cal Advocates’ exceedance methodology,¹⁴ averaged across the AAH, will significantly increase the QC values for wind and solar compared to effective load carrying capability (ELCC) values today, as shown in Table 1 below.

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¹² PD, p. 77.

¹³ PD, p. 77.

¹⁴ See *CalPA Comparison of Solar and Wind Proposals workbook*, November 3, 2022: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/resource-adequacy-compliance-materials/resource-adequacy-history/ra-reform-excel-workbooks/20221103-workshop-proposal-comparisons-v4.xlsx>.

Table 1 – Average of hourly values across AAH based on Cal Advocates exceedance approach versus 2023 ELCC values

Month	Solar Avg. AAH	Solar Hours 19/20	Solar ELCC	NP15 Wind Avg. AAH	NP15 Wind ELCC	SP15 Wind Avg. AAH	SP15 Wind ELCC
June	35%	35%/8%	13%	48%	25%	29%	15%
July	30%	29%/6%	14%	51%	23%	32%	14%
August	26%	18%/1%	12%	43%	21%	28%	11%
September	19%	4%/0%	11%	30%	22%	18%	11%

Table 1 shows that the AAH average value could inflate the value of solar, in particular, to meet demand at peak. Table 1 shows the capacity factors under the approach the Commission will use to derive QC values for use in CAISO processes could be significantly higher than capacity factors in peak hours under the Cal Advocates exceedance approach. This could result in discrepancies between the Commission and CAISO compliance checks at peak, where solar resources in particular could count for significantly more towards system peak requirements at the CAISO than in peak hours at the Commission. In turn, this could result in LSEs meeting system requirements at the CAISO but not passing compliance at the Commission in peak hours. This approach also raises questions about how the Commission’s PRM is appropriate for use in the CAISO’s processes.

To avoid over-counting of variable energy resource (VER) production at peak hours in CAISO processes, the Commission should adopt an alternative approach to determine the QC value provided to the CAISO for wind and solar resources. To set the NQC list, the Commission should instead provide the CAISO the greater of the minimum hourly exceedance value across the AAH and a very small non-zero value (*e.g.*, 0.01 MW) if the minimum value is zero. Alternatively, the Commission could provide the CAISO the greater of the peak hour value and a very small non-zero value (*e.g.*, 0.01 MW) if the peak hour value is zero. These approaches would better align Commission and CAISO counting and compliance in critical peak hours.

3. The Commission Should Re-Evaluate Values Used as Inputs to CAISO Processes After Experience with the Test Year and After Further Discussion in CAISO’s Forthcoming Stakeholder Process.

The Commission should re-evaluate values used as inputs to CAISO processes after experience with the test year and after parties have had an opportunity to evaluate the results of new counting methodologies for wind, solar, and demand response, and the interaction of these new counting values with the PRM under the Slice of Day framework.

The CAISO will also open its own resource adequacy stakeholder process later this year. In this stakeholder process, the CAISO will discuss potential changes to its resource adequacy framework with all local regulatory authorities (LRAs), including how the CAISO will operationalize the Commission’s Slice of Day framework. The Commission should allow parties to re-evaluate values used as an input to CAISO processes after experience with the Slice of Day test year and after the CAISO has discussed and coordinated potential changes to its resource adequacy processes with other LRAs.

D. The CAISO Supports Further Consideration of Unforced Capacity Evaluation (UCAP) in the Resource Adequacy Proceeding.

The CAISO agrees with the PD that “[i]t is appropriate... to explore a comprehensive application of UCAP to account for other types of forced outages, not just ambient derates.”¹⁵ The CAISO supports further exploration of a more comprehensive application of UCAP to account for other types of forced outages in resource counting, not just ambient de-rates.

The CAISO provides a clarifying response to a statement in the PD. The PD states, “We recognize the concerns and limitations with CAISO’s current outage data that have hindered development of an implementable proposal. We encourage CAISO to work through these data limitations to further develop a full UCAP mechanism for consideration in this proceeding.”¹⁶ The CAISO clarifies that CAISO’s outage data is not the only source of forced outage data parties can use to develop a UCAP methodology. In fact, Energy Division currently uses Generator Availability Data System data to apply a UCAP approach to resource counting in its SERV modeling that supports the resource adequacy and Integrated Resource Planning

¹⁵ PD, p. 41.

¹⁶ PD, p. 41.

proceedings.¹⁷ Additionally, although the CAISO can pursue enhancements to the format of CAISO outage data, parties have been able to work with CAISO’s current public outage data as is. For example, Energy Division staff was able to analyze CAISO’s public outage data to develop its ambient de-rate proposal in this proceeding.¹⁸

E. The CAISO supports the PD’s Conclusion on Flexible Resource Adequacy.

The PD does not adopt changes to the flexible resource adequacy framework at this time. The PD states, “[T]he process to remove flexible RA requirements must be coordinated with CAISO’s tariff and processes, which will require a CAISO stakeholder process to remove or modify.”¹⁹ The CAISO agrees with the PD that flexible capacity requirements are part of the CAISO tariff, and ultimately a CAISO stakeholder process will be required to modify or eliminate flexible capacity requirements. The CAISO will continue to coordinate with the Commission and Energy Division staff on potential changes to the flexible resource adequacy design going forward.

F. The CAISO Agrees With the PD on Counting Rules for Energy-Only VERs Co-Located with Storage Resources.

The CAISO agrees with the Commission’s determination that “[t]he charging capacity of the renewable resource should be capped at the amount that can be used to charge the on-site storage and the storage should be capped at the interconnection limit.”²⁰ The CAISO also agrees with the Commission's determination that energy-only (EO) VER production in excess of that used to charge the co-located storage resource should not count towards meeting resource adequacy requirements under the Slice of Day framework.

The CAISO corrects a statement by the California Energy Storage Alliance (CESA) referenced in the PD, which CESA raised in reply comments on the Resource Adequacy Reform

¹⁷ Energy Division Modeling Team, *SERVM Production Cost Modeling Results: Unit outage rates resulting from 2024 RA modeling*, January 19, 2022, p. 4 available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/workshop-9-ed_outage-rate-slides-1-17-2022.pdf

¹⁸ Energy Division Staff, *Proposal for Derating Thermal Power Plants based on Ambient Temperature*, R.21-10-002, January 20, 2023, p. 5.

¹⁹ PD, p. 79.

²⁰ PD, p. 38.

Report.²¹ The PD states, “CESA adds that while EO VERs are not subject to substitution rules, RA-providing VERs are not either and allowing EO standalone VERs to meet charging sufficiency verification provides little risk.”²² The CAISO clarifies that resource adequacy VERs are subject to CAISO substitution rules like other resource adequacy resources.

G. The Commission Should Ensure Consistency Between the NRDC Calibration Tool and LSE Showing Tools.

The PD adopts NRDC’s Calibration Tool to convert LOLE study results to the Slice of Day framework in order to set the PRM under Slice of Day.²³ The PD also adopts Southern California Edison Company’s (SCE) LSE Showing Tool with Clean Power Alliance’s (CPA) modification to include storage charging sufficiency constraints.²⁴ LSEs will use the Showing Tool for resource adequacy compliance showings to the Commission.

The CAISO recommends the Commission augment the NRDC Calibration Tool to include CPA’s energy storage constraints, which include modeling resource PMIN (maximum charging MW) and temporal charging constraints. Adding these constraints will allow the NRDC tool to dispatch storage resources realistically within their physical limitations, producing more accurate PRM results. In general, the Commission should ensure consistency between the NRDC Calibration and LSE Showing tools. The NRDC tool should model the same assumptions about generation capabilities that are used to evaluate LSE portfolio compliance.

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²¹ CESA Reply Comments on the Workshop Report on Final Proposals from Reform Track Phase 2 Workstreams 1-3, December 12, 2022, p. 3.

²² PD, p. 37.

²³ PD, p. 60.

²⁴ PD, p. 15.

III. Conclusion

The CAISO appreciates the opportunity to provide comments on the PD.

Respectfully submitted

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