

Docket No.: R.20-11-003  
Exhibit No.: \_\_\_\_\_  
Witness: Bill Powers, P.E.  
Commissioner: Marybel Batjer  
ALJ: Brian Stevens,  
Sarah R. Thomas

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

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  
(Filed November 19, 2020)

**PREPARED REPLY TESTIMONY OF BILL POWERS, P.E.  
ON BEHALF OF THE PROTECT OUR COMMUNITIES FOUNDATION,  
PROPOSALS, AND COMMENTS ON ENERGY DIVISION STAFF CONCEPTS**

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Dated: September 10, 2021

## TABLE OF CONTENTS

	<u>Page</u>
I. CAISO’S RECOMMENDATION TO MAINTAIN A 17.5% PLANNING RESERVE MARGIN FOR THE 8 PM HOUR SHOULD BE REJECTED BY THE COMMISSION.....	1
II. CAISO’S FOCUS ON ASSUMING EXCESSIVE FORCED OUTAGE RATES IS MISPLACED – THE COMMISSION SHOULD FOCUS ON REDUCING UNACCEPTABLY HIGH PLANT OUTAGE RATES, AND CURTAILING POWER EXPORTS.....	5
A. CAISO’s Testimony Fails to Support Any Increase to Power Plant Outage Assumptions.	6
B. The EFOR Metric Fails to Account for California’s Generation Mix and Actual Historical Outage Experience for Specific Generation Classes.....	10
C. Increasing the Assumed Forced Outage Rate Glosses Over Operational Deficiencies That Must Be Investigated and Prevented.....	12
III. THE COMMISSION SHOULD REJECT UTILITY ATTEMPTS TO INCREASE THEIR SHARE OF BATTERY STORAGE OWNERSHIP .....	13
IV. SDG&E AND OTHER UTILITIES SHOULD MAKE THEIR RESIDENTIAL AND SMALL COMMERCIAL A/C CYCLING PROGRAMS OPT-OUT PROGRAMS TO MAXIMIZE PEAK LOAD REDUCTION POTENTIAL .....	14
V. CONCLUSION .....	15

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2 **PREPARED REPLY TESTIMONY OF BILL POWERS, P.E.**  
3 **ON BEHALF OF THE PROTECT OUR COMMUNITIES FOUNDATION,**  
4 **PROPOSALS, AND COMMENTS ON ENERGY DIVISION STAFF CONCEPTS**

5 I submit this reply testimony on behalf of The Protect Our Communities Foundation  
6 (“PCF”), pursuant to Rule 14.3 of the Commission’s Rules of Practice and Procedure, in  
7 accordance with the Assigned Commissioner’s August 10, 2021 Amended Scoping Memo and  
8 Ruling for Phase 2, ALJ Stevens’ Email Ruling of August 11, 2021, providing “Proposal  
9 Guidance to Parties” and ALJ Stevens’ August 16, 2021 Email Ruling providing the Energy  
10 Division Staff Concept Paper with Proposals for Summer 2022 and 2023 Reliability  
11 Enhancements.<sup>1</sup> This reply testimony responds to the opening testimony of the California  
12 Independent System Operator (CAISO), Public Advocates Office (Cal Advocates), and San  
13 Diego Gas & Electric (SDG&E), among others.

14 **I. CAISO’S RECOMMENDATION TO MAINTAIN A 17.5% PLANNING**  
15 **RESERVE MARGIN FOR THE 8 PM HOUR SHOULD BE REJECTED BY**  
16 **THE COMMISSION**

17 The CAISO recommendation that the Commission should “apply the adopted planning  
18 reserve margin (17.5% as proposed by the CAISO) to derive the resource adequacy obligation at  
19 8:00 pm” should be rejected by the Commission.<sup>2</sup> CAISO uses the August 2020 rolling blackouts  
20 to support this recommendation. CAISO’s basis for selecting 8 pm relies on their assumption that  
21 demand is still substantial and solar power is no longer available at that time.

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<sup>1</sup> PCF combines these documents as directed by ALJ Stevens on August 25, 2021 in response to the question by Gregory Klatt. R.20-11-003, Email from ALJ Stevens to Gregory Klatt and the R.20-11-003 service list (August 25, 2021) “...Parties should put as many of their recommendations as possible in their September 1, 2021 Opening Testimony given the expedited nature of this proceeding. Matters raised in the staff concepts document shall be addressed in the Opening Testimony...”)

<sup>2</sup> CAISO Opening Testimony, p. 10.

1 The August 2020 rolling blackouts were initiated at approximately 6:30 pm on the two  
 2 days rolling blackouts occurred, August 14 and August 15, 2020,<sup>3</sup> when solar output was still  
 3 substantial.<sup>4</sup> By 8 pm on those two days, the combination of increased large hydro, imports, and  
 4 battery storage supply - and reduced demand by 8 pm - largely or completely offset the  
 5 unavailability of solar at 8 pm. See Table 1.

6 The average hour of the annual peak load in the last five years has been approximately 5  
 7 pm.<sup>5</sup> For this reason, the CAISO supply mix at 5 pm is compared to the supply mix at 8 pm in  
 8 Table 1. The data on renewables supply, large hydro, imports, battery storage, and CAISO  
 9 demand reduction between 5 pm and 8 pm presented in Table 1 were taken directly from  
 10 CAISO’s “demand trend” and “supply trend” charts for the days in question, which are available  
 11 on CAISO’s webpage.<sup>6</sup> The last column of Table 1 shows the sum of Columns 1-4.

12 **Table 1. Change in CAISO supply mix between 5 pm – 8 pm, August 14-15, 2020**

Date/time	Renewables supply, MW [1]	Hydro + imports supply, MW [2]	Battery storage, MW [3]	Reduction in CAISO demand, 5 pm – 8 pm, MW [4]	Total net supply, sum of Columns 1-4, MW
August 14, 2020					
5:00 pm	10,146	9,597	32	-	19,775
8:00 pm	3,159	12,629	111	4,478	20,377
August 15, 2020					
5:00 pm	10,051	8,559	8	-	18,618
8:00 pm	4,150	10,964	96	1,860	17,070 <sup>7</sup>

<sup>3</sup> R.20-11-003, Prepared Opening Testimony of Bill Powers, P.E. on Behalf of the Protect Our Communities Foundation, January 11, 2021, p. 11.

<sup>4</sup> Solar supply to CAISO at 6:35 pm on August 14, 2020, one minute before CAISO initiated the rolling blackout that day, was 3,111 MW. Solar supply to CAISO at 6:25 pm on August 15, 2020, three minutes before CAISO initiated the rolling blackout that day, was 2,326 MW. See “Renewables Trend” graphic: <http://www.caiso.com/todaysoutlook/pages/supply.html>.

<sup>5</sup> See “California ISO Peak Load History 1998 through 2020”: <https://www.caiso.com/documents/californiaisopeakloadhistory.pdf>.

<sup>6</sup> CAISO “Demand trend” webpage: <http://www.caiso.com/TodaysOutlook/Pages/index.html>; CAISO’s “Supply trend” webpage: <http://www.caiso.com/TodaysOutlook/Pages/supply.html>.

<sup>7</sup> The CAISO systemwide demand at 5 pm on August 15, 2020, 44,462 MW, was 2,315 MW lower than the systemwide demand of 46,777 MW at 5 pm on August 14, 2020. See CAISO “Demand Trend”: <http://www.caiso.com/TodaysOutlook/Pages/default.aspx>.

1 This same “supply substitution” pattern between 5 pm and 8 pm holds in the summer of  
 2 2021. Table 2 provides the same comparison shown in Table 1 for the three days (to date) in the  
 3 summer of 2021, July 9, 2021, September 8, 2021, and September 9, 2021, where the CAISO  
 4 called a Flex Alert and the actual peak demand for that day exceeded 42,000 MW.<sup>8</sup> Despite a  
 5 precipitous decline in solar power supply between 5 pm and 8 pm, there is little change in  
 6 available supply at 8 pm, due to increased supply from large hydro, imports, and battery storage -  
 7 and declining demand at the 8 pm hour – which largely or completely substitutes for the lack of  
 8 solar power.

9 **Table 2. Change in CAISO supply mix between 5 pm – 8 pm, July 9, 2021 and**  
 10 **September 8-9, 2021**

Date/time	Renewables supply, MW [1]	Hydro + imports supply, MW [2]	Battery storage, MW [3]	Reduction in CAISO demand, 5 pm – 8 pm, MW [4]	Total net supply, sum of Columns 1-4, MW
July 9, 2021					
5:00 pm	13,921	3,461	-144	-	17,238
8:00 pm	5,277	6,957	823	3,369	16,426
September 8, 2021					
5:00 pm	11,626	7,185	205	-	19,016
8:00 pm	3,742	10,982	804	3,188	18,716
September 9, 2021					
5:00 pm	11,427	6,210	80	-	17,717
8:00 pm	3,771	10,849	652	3,356	18,628

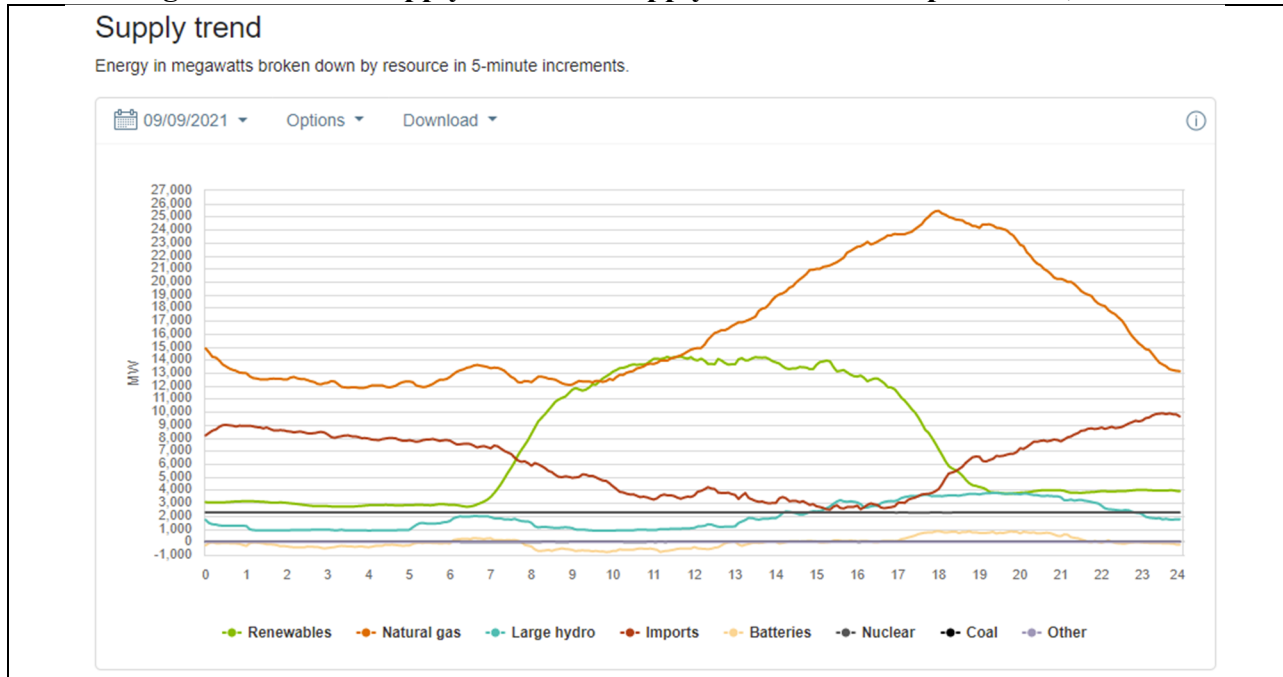
11  
 12 Figure 1 shows the supply trends on September 9, 2021 for different supply resource  
 13 types. Figure 1 shows graphically the increase in large hydro, imports, and battery storage that  
 14 substituted for the solar power supply at 8 pm on September 9, 2021.

15

<sup>8</sup> See CAISO “Demand trend”: <http://www.caiso.com/TodaysOutlook/Pages/index.html>. July 9, 2021, peak demand = 43,193MW at 5:35 pm; September 8, 2021, peak demand = 43,936 MW at 5:50 pm; September 9, 2021, peak demand = 43,346 MW at 5:30 pm.

1

**Figure 1. CAISO supply trends for supply resources on September 9, 2021<sup>9</sup>**



2

3

CAISO’s claim that “*the existing 15% planning reserve margin results in woefully*

4

*inadequate resource adequacy at 8:00 p.m.,” with calculated summer monthly 8 pm reserve*

5

margins of 10 to 12 percent presented in Table 3 of its opening testimony,<sup>10</sup> is unsupported by

6

any evidence. In fact, for four of the five days included in Tables 1 and 2, August 14-15, 2020,

7

and September 8-9, 2021, gas-fired supply was in decline by 8 pm.<sup>11</sup> The primary reason gas-

8

fired generation was not already in decline at 8 pm on July 9, 2021 is due to the Bootleg Fire in

9

Oregon, which resulted in the partial shutdown of California’s primary north-south import

10

pathway, and up to 3,500 MW of import capacity on that pathway was temporarily unavailable.<sup>12</sup>

<sup>9</sup> CAISO “Supply trend”: <http://www.caiso.com/TodaysOutlook/Pages/supply.html>.

<sup>10</sup> CAISO Opening Testimony, Table 3, p. 8.

<sup>11</sup> CAISO “Supply trend”: <http://www.caiso.com/TodaysOutlook/Pages/supply.html>.

<sup>12</sup> CAISO Flex Alert, *California ISO Issues Flex Alert for Monday, July 12 due to wildfires, heat*, July 11, 2021: <https://www.caiso.com/Documents/California-ISO-Issues-Flex-Alert-for-Monday-July-12-due-to-Wildfires-Heat.pdf>. “Power supplies to the California ISO service territory, which covers about 80 percent of the state, have been reduced by as much as 3,500 megawatts because of the fire.”

1           The tables and data above demonstrate that the demand patterns on the highest demand  
2 days in 2020 and 2021 confirm that gas-fired supply in the CAISO control area is declining at 8  
3 pm. By 8 pm, large hydro, imports, and battery storage, combined with lower demand, are filling  
4 the supply “gap” in the absence of solar power. This reality indicates that existing reserve  
5 margins are sufficient at 8 pm. No “woefully inadequate” reserve margin issue exists at 8 pm to  
6 address, despite CAISO claims to the contrary.

7           The problems that led to the August 2020 rolling blackouts were twofold and essentially  
8 unrelated to the adequacy of the planning reserve margin, as explained in my January 11, 2021  
9 opening testimony and January 19, 2021 reply testimony<sup>13</sup> and in my September 1, 2021 opening  
10 testimony<sup>14</sup>: 1) the failure of many plants to perform due to avoidable operational problems  
11 (which increasing the planning reserve margin will not rectify), and 2) the exporting of 3,500  
12 MW of California supply at the time the rolling blackouts were initiated by CAISO.

13           **II. CAISO’S FOCUS ON ASSUMING EXCESSIVE FORCED OUTAGE RATES**  
14           **IS MISPLACED – THE COMMISSION SHOULD FOCUS ON REDUCING**  
15           **UNACCEPTABLY HIGH PLANT OUTAGE RATES, AND CURTAILING**  
16           **POWER EXPORTS**

17           CAISO advocates for an increase in the planning reserve margin from 15 percent to 17.5  
18 percent to reflect what it characterizes as industry average forced outage rates.<sup>15</sup> The  
19 Commission assumes a forced outage rate of 5 percent.<sup>16</sup> CAISO asserts the forced outage rate  
20 assumption should be increased to 7.5 percent.<sup>17</sup>

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<sup>13</sup> R.20-11-003, Prepared Opening Testimony of Bill Powers, P.E. on Behalf of the Protect Our Communities Foundation, January 11, 2021, p. 6, pp. 9-11; R.20-11-003, Reply Testimony of Bill Powers, P.E. on Behalf of the Protect Our Communities Foundation, January 19, 2021.

<sup>14</sup> R.20-11-003, The Protect Our Communities Foundation Opening Testimony of Bill Powers, P.E., Proposals, and Comments on Energy Division Staff Concepts, September 1, 2021.

<sup>15</sup> CAISO Opening Testimony, p. 12.

<sup>16</sup> R.20-11-003, Opening Testimony of Jeff Billinton on Behalf of the California Independent System Operator Corporation, p. 3, lines 24-25.

<sup>17</sup> CAISO Opening Testimony, p. 12.

1 NERC Generator Availability Data System (GADS) data show a 7.2% industry  
2 forced outage rate. The CAISO discussed this data in detail in its January 11,  
3 2021 testimony in this proceeding. The GADS forced outage rate is a reasonable  
4 industry accepted measure of expected forced outages and the CAISO  
5 recommends that a 7.5% forced outage rate be used to allow for a more  
6 appropriate amount of expected forced outages.

7  
8 CAISO does not address the obvious alternative to increasing the assumed forced outage rate in  
9 its opening testimony. That alternative is to assure that existing capacity that ratepayers are  
10 already paying for remains fully available to address peak load conditions.

11 **A. CAISO's Testimony Fails to Support Any Increase to Power Plant Outage**  
12 **Assumptions.**

13 CAISO provides no analysis in its opening testimony of the causes of the high outage  
14 levels among the gas-fired power plants that occurred over the August 14-15, 2020 period.  
15 Moreover, the CAISO's Preliminary Root Cause Analysis (PRCA) published on October 6,  
16 2020, and Final Root Cause Analysis (FRCA) published on January 13, 2021, are both silent on  
17 the causes of unit outages and partial curtailments during the days and hours leading up to the  
18 blackouts called by CAISO. My review of the data reveals that three of nine Southern California  
19 units, equaling 1,256 MW<sup>18</sup> were unavailable when the first rolling blackout was initiated at  
20 6:38 pm on August 14, 2020. The combined curtailment of the Southern California OTC fleet at  
21 the time the rolling blackouts were initiated totaled 1,415 MW, including partial curtailments,  
22 which equals nearly 40 percent of the Southern California OTC fleet Net Qualifying Capacity  
23 (NQC) capacity in August 2020.

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<sup>18</sup> **Exhibit A:** R.19-11-009, CAISO, Response of the California Independent System Operator Corporation to Data Request Number PCF-CAISO-2020RA-02 by Protect Our Communities Foundation (November 16, 2020), December 8, 2020, p. 12. The three units in full outage included 336 MW Alamitos 4 (planned), 179 MW Redondo Beach 5 (forced), and 741 MW Ormond Beach Unit 1 (forced).



1           These Southern California OTC units were under contract as NQC generation to run  
2 when needed in 2020. The high outage rates on August 14-15, 2020 represent a fundamental  
3 failure to achieve this central purpose.

4           Additionally, two of the five utility-owned combined cycle plants also experienced  
5 substantial partial curtailments on August 14-15, 2020.<sup>19</sup> These two combined-cycle plants,  
6 Gateway (PG&E) and Desert Star (SDG&E), were collectively curtailed by 460 MW on August  
7 14<sup>th</sup> and approximately 300 MW on August 15<sup>th</sup>.<sup>20</sup> These high levels of partial curtailment during  
8 a summer heat wave cannot be considered normal or acceptable by CAISO or the operators of  
9 these units. Neither CAISO’s Preliminary Root Cause Analysis (PCRA) published October 6,  
10 2020, or Final Root Cause Analysis (FRCA) published January 13, 2021, raise or discuss these  
11 partial curtailments in their analyses of the causes of the blackouts.

12           As noted, CAISO opening testimony fails to identify, much less understand, the causes of  
13 the high outage rates of these units on August 14-15, 2020. One cause – planned outages during  
14 the summer peak load season – has an obvious solution. Planned outages must be prohibited  
15 during the July 1 – October 1 period when peak loads historically occur in the CAISO control  
16 area. Prohibiting planned outages during periods of hot weather and high demand would ensure  
17 increased supply when California needs that supply the most. Prudent practice and common  
18 sense requires all generation to be ready to run at times of when high demand can occur – the  
19 summer and fall in California. Thus, 336 MW Alamos Unit 4 should not have been in a  
20 planned outage in mid-August 2020, but CAISO allowed it be in outage.<sup>21</sup>

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<sup>19</sup> R.20-11-003, Opening Testimony of Bill Powers, P.E. on Behalf of Protect Our Communities Foundation, January 11, 2021, p. 11.

<sup>20</sup> Ibid, p. 11.

<sup>21</sup> **Exhibit A**, p. 7. “Alamos 4 was on planned outage on August 14, 2020.”

1 CAISO has also failed to properly determine the root causes of the numerous total and  
2 partial forced outages among gas-fired power plants on August 14-15, 2020. CAISO and the  
3 Commission maintain an obligation under Pub. Util. Code § 761.3(e) to investigate the causes of  
4 these forced outages.<sup>22</sup> These total and partial forced outages include Redondo Beach Unit 5,  
5 Ormond Beach Unit 1, Gateway combined-cycle (partial), and Desert Star combined cycle  
6 (partial).

7 The dominant form of non-renewable generation in CAISO remains natural gas  
8 combined-cycle and cogeneration power plants, with approximately 18,000 MW of capacity  
9 listed in CAISO’s 2021 NQC List.<sup>23</sup> Combined cycle plants had a nationwide average Effective  
10 Forced Outage Rate – Demand (EFORd) of 3.69 percent in 2019,<sup>24</sup> less than half the 7.5 percent  
11 forced outage rate proposed for use by CAISO in the summer of 2021. Yet two of five utility-  
12 owned combined cycle plants, totaling 40 percent of all of the utility-owned plants, experienced  
13 substantial partial forced curtailments during the rolling blackouts on August 14-15, 2020. The  
14 CAISO does not address in the PCRA or the FCRA the reasons for these combined cycle plant  
15 outages.

16 Gas-fired utility boilers with nameplate capacity between 800 MW and 999 MW, like  
17 806 MW Unit 1 and 806 MW Unit 2 at Ormond Beach, had an EFORd of 3.01 percent in 2019.<sup>25</sup>  
18 Yet the forced outage rate at Ormond Beach on August 14<sup>th</sup>, 2020 was 50 percent, with Ormond  
19 Beach Unit 1 in full force outage at the time of the blackout. PCF issued data requests to CAISO

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<sup>22</sup> Pub. Util. Code § 761.3(e).

<sup>23</sup> **Exhibit C:** R.19-11-009, CAISO, Response of the California Independent System Operator Corporation to Data Request Number PCF-CAISO-2020RA-02 by Protect Our Communities Foundation (November 16, 2020), December 10, 2020, p. 3.

<sup>24</sup> **Exhibit B:** NERC, 2019 Generating Unit Statistical Brochure 2 – All Units Reporting, September 15, 2020 (xls spreadsheet): <https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx>.

<sup>25</sup> **Exhibit B.**

1 in the R.19-11-003 (Resource Adequacy) asking for the specific reasons that Redondo Beach  
2 Unit 5 and Ormond Beach Unit 1 were in forced outage on August 14, 2020. Regarding the root  
3 cause(s) of these curtailments, the CAISO response was the same:<sup>26</sup>

4 The data requested at the individual resource level is not relevant to the CPUC  
5 RA program. The “specific problem(s)” that lead to an individual unit forced  
6 outage are not relevant to the CPUC RA proceeding. The CAISO requests that  
7 PCF explain why this information should come from the CAISO rather than the  
8 unit owner, which is in better position to provide a detailed response.

9  
10 First, data on plant outages is directly relevant to the RA proceeding – and to this  
11 proceeding – because the CAISO’s only proposed remedy to prevent future blackouts involves  
12 increasing the reserve margin and ordering additional procurement. Second, CAISO is mistaken  
13 that it has no responsibility to investigate the causes of forced outages. Pub. Util. Code §  
14 761.3(e) requires that CAISO identify the causes of the forced outages and immediately  
15 communicate that information to the Commission once it is received.<sup>27</sup>

16 California routinely experiences heat waves in August and September virtually every  
17 year. Neither CAISO, the utilities, nor the power plant generators were caught by surprise by the  
18 heat wave that began on August 14-15, 2020. CAISO issued a Restricted Maintenance Operation  
19 (RMO) order at 6:55 am on August 12<sup>th</sup>,<sup>28</sup> 60 hours before the first blackout was initiated at 6:36

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<sup>26</sup> Exhibit A, pp. 7-9.

<sup>27</sup> R.20-11-003, Opening Testimony of Bill Powers, P.E. on Behalf of Protect Our Communities Foundation, January 11, 2021, p. 9, footnote 25.

<sup>28</sup> CAISO, *Summary of Restricted Maintenance Operations, Alert, Warning, Emergency, and Flex Alert Notices Issued from 1998 to Present*, revision date December 23, 2020, p. 4:  
<http://www.caiso.com/Documents/AWE-Grid-History-Report-1998-Present.pdf#search=RMO%202020>.

1 pm on August 14<sup>th</sup>.<sup>29</sup> A Flex Alert was issued at 9:24 am on August 13<sup>th</sup>, 32 hours before the  
2 blackout was initiated on August 14<sup>th</sup>.<sup>30</sup>

3 **B. The EFOR Metric Fails to Account for California’s Generation Mix and Actual**  
4 **Historical Outage Experience for Specific Generation Classes.**

5 CAISO identifies the nationwide average forced outage rate for units of all types, using  
6 the Weighted Effective Forced Outage Rate (EFOR) metric,<sup>31</sup> as 7.2 percent as the basis for  
7 advocating the Commission assume a 7.5 percent outage rate at peak load.<sup>32</sup> This statistic is a  
8 nationwide average for all types of non-renewable power plants, including coal-fired power  
9 plants, and not the limited subset of the nationwide power plant fleet relied upon by CAISO. No  
10 coal plants exist in the CAISO control area.

11 The EFOR is the wrong metric to use in any case. The EFOR represents the percentage of  
12 time a unit is in forced outage over its entire scheduled operating time.<sup>33</sup> The forced outage rate  
13 that matters for summer heat waves is the forced outage rate during the afternoon peak demand  
14 period. That metric is EFORd.<sup>34</sup> The EFORd is consistently lower than the EFOR for all  
15 generation types.<sup>35</sup>

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<sup>29</sup> CAISO, *Summary of Restricted Maintenance Operations, Alert, Warning, Emergency, and Flex Alert Notices Issued from 1998 to Present*, revision date December 23, 2020, p. 4:

<http://www.caiso.com/Documents/AWE-Grid-History-Report-1998-Present.pdf#search=RMO%202020>.

<sup>30</sup> CAISO, *Statewide Flex Alert issued for Friday, calling for energy conservation*, August 13, 2020:

<http://www.caiso.com/Documents/Statewide-Flex-Alert-Issued-Friday-Calling-Energy-Conservation.pdf>.

<sup>31</sup> R.20-11-003, Opening Testimony of Jeff Billinton on Behalf of the California Independent System Operator Corporation, January 11, 2021, p. 4.

<sup>32</sup> Ibid, p. 4.

<sup>33</sup> G.M. Curley - Generation Consulting Services, LLC, *Reliability Analysis of Power Plant Unit Outage Problems*, 2013, p. 33: [https://www.cw-connect.com/sites/default/files/2020-01/Reliability\\_Analysis\\_of\\_Power\\_Plant\\_Unit\\_Outage\\_Problems\\_2013.pdf](https://www.cw-connect.com/sites/default/files/2020-01/Reliability_Analysis_of_Power_Plant_Unit_Outage_Problems_2013.pdf). “EFOR = The percent of scheduled operating time that a unit is out of service due to unexpected problems or failures AND cannot reach full capability due to forced component or equipment failures.”

<sup>34</sup> Ibid, p. 38. “EFORd will allow you to measure the probability of a forced event during demand times.”

<sup>35</sup> **Exhibit B:** NERC, 2019 Generating Unit Statistical Brochure 2 – All Units Reporting, September 15, 2020 (xls spreadsheet): <https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx>.

1 Nuclear plants had a nationwide average forced outage rate of 2.06 percent in 2019.<sup>36</sup>  
2 One nuclear plant remains in the CAISO control area, the 2,280 MW Diablo Canyon, which will  
3 run until 2025.

4 Combined cycle power plants, nuclear, and large gas-fired utility boilers dominate the  
5 non-renewable dispatchable power supply in the CAISO control area. Collectively these units, on  
6 an average nationwide basis, had a 2019 forced outage rate of approximately 3 percent.

7 Combustion turbines had a higher forced outage rate in 2019 than the other non-renewable  
8 supply sources, about 10 percent,<sup>37</sup> though they make up a relatively small portion of the non-  
9 renewable supply in the CAISO resource portfolio. Given the resource mix in California, the  
10 current assumption by the Commission of a 5 percent outage rate remains reasonable and  
11 continues to be the most appropriate fact-based outage percentage.<sup>38</sup> Moreover, California's  
12 forced outage rate can be further reduced by requiring best maintenance practices in the CAISO  
13 control area and not simply by assuming that national average outage rates applied to  
14 California's power resources are sufficient.

15 In light of the 2019 EFORd data, it is not unreasonable to expect that there would have  
16 been no curtailments during the August 2020 heat wave among the gas-fired power plants. To  
17 have five of fourteen of these units in full or partial curtailment on August 14<sup>th</sup>, and four of  
18 fourteen units in full or partial curtailment on August 15<sup>th</sup>, demands an in-depth review of  
19 operations and maintenance practices of the gas-fired power plants on which California relies, an  
20 investigation that has not yet been conducted by the Commission or CAISO.

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<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> R.20-11-003, Opening Testimony of Jeff Billinton on Behalf of the California Independent System Operator Corporation, January 11, 2021, p. 3.

1           **C. Increasing the Assumed Forced Outage Rate Glosses Over Operational**  
2           **Deficiencies That Must Be Investigated and Prevented.**

3           The increase in the assumed forced outage rate to 7.5 percent requested by CAISO would  
4 also gloss over operational and dispatch deficiencies that should be rectified and not ignored.  
5 Specifically, the inexplicable scheduling coordinator instruction to the Panoche 400 MW  
6 combustion turbine power plant to reduce output by 248 MW at 6:13 pm on August 15<sup>th</sup>, 15  
7 minutes before CAISO initiated a 470 MW rolling blackout at 6:28 pm, materially tipped the  
8 balance that led to the blackout.<sup>39</sup> The scheduling coordinator for Panoche is PG&E.<sup>40</sup> The units  
9 at Panoche consist of extremely fast LMS100 gas turbines, and those turbines could have  
10 recovered the entire 248 MW load drop in one minute or less.<sup>41</sup> The PRCA and the FCRA  
11 include no information about when Panoche was instructed by CAISO to reverse the erroneous  
12 curtailment. The subsequent January 2021 Safety and Enforcement Division (SED) review of the  
13 Panoche incident concludes in essence that “stuff happens,” and recommends no action in  
14 response.<sup>42</sup>

15           Cal Advocates’ recommendation that the forced outage assumption be increased to 7  
16 percent,<sup>43</sup> which according to Cal Advocates corresponds to which corresponds to 7.3 percent of  
17 the 1-in-2 forecast, should also be rejected by the Commission for the same reasons detailed  
18 above. Cal Advocates’ recommendation, like CAISO’s recommendation to adopt a 7.5 percent

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<sup>39</sup> A precipitous decline in imports also began at 6:25 pm, with imports declining from 5,920 MW at 6:25 pm to 5,247 MW at 6:35 pm, a nearly 700 MW reduction in 10 minutes. See CAISO Today’s Outlook, Supply, Supply Trend, August 15, 2020: <http://www.aiso.com/TodaysOutlook/Pages/supply.html>.

<sup>40</sup> Court of Appeal, First District, Division 4, California, Panoche Energy Center, LLC, Plaintiff and Respondent, v. Pacific Gas and Electric Company, Defendant and Appellant, A140000, July 1, 2016: <https://caselaw.findlaw.com/ca-court-of-appeal/1740779.html>.

<sup>41</sup> GE, LMS100 Power Plants (brochure), November 2018: [https://www.ge.com/content/dam/gepower-pgdp/global/en\\_US/documents/product/gas%20turbines/Fact%20Sheet/2018-prod-specs/GEA32933A%20LMS100\\_Power\\_Plants\\_R2.pdf](https://www.ge.com/content/dam/gepower-pgdp/global/en_US/documents/product/gas%20turbines/Fact%20Sheet/2018-prod-specs/GEA32933A%20LMS100_Power_Plants_R2.pdf).

<sup>42</sup> CPUC, Safety and Enforcement Division - Electric Safety and Reliability Branch, Investigation of August 12-20, 2021 outages, updated January 13, 2021, pp. 16-17.

<sup>43</sup> Cal Advocates Opening Testimony, Appendix B, p. 9.

1 forced outage rate assumption, lacks factual support sufficient for this Commission to adopt or  
2 rely on either recommendation.

3 Before the Commission increases the reserve margin to 17.5 percent, or orders additional  
4 procurement, the Commission should determine: 1) why the Southern California OTC units and  
5 the IOU-owned combined cycle units experienced such high forced outage rates as the heat wave  
6 bore down on California in mid-August 2020, 2) why the erroneous Panoche dispatch instruction  
7 on August 15, 2020 was not immediately reversed, and 3) what remedial O&M and dispatch  
8 protocols must be instituted immediately by the Commission and CAISO to assure that  
9 California’s fleet of generators at a minimum achieve the national average forced outage rates for  
10 each class of generator.

11 **III. THE COMMISSION SHOULD REJECT UTILITY ATTEMPTS TO**  
12 **INCREASE THEIR SHARE OF BATTERY STORAGE OWNERSHIP**

13 SDG&E attempts another bite at the apple to advance numerous overpriced battery  
14 storage projects – using this proceeding to seek a ruling from the Commission by September 15,  
15 2021 that would pave the way for fast-track approval – that the Commission previously denied in  
16 D.19-06-032.<sup>44</sup> SDG&E proposed in 2018 to add battery storage and switchgear to seven  
17 distribution substation feeders to enable community microgrids, at a cost of \$284.6 million for  
18 100 MW<sub>AC</sub> of battery storage.<sup>45</sup> Ratepayer advocates protested the large size and high cost of the  
19 battery systems, and the fact that they would be owned by SDG&E. SDG&E was ordered by the  
20 Commission in D.19-06-032 to file a new application for the substation battery storage  
21 microgrids that included non-utility bids. The Commission should summarily reject this second

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<sup>44</sup> SDG&E Opening Testimony – Jennell McKay, p. 6.

<sup>45</sup> CPUC Decision D.19-06-032, *Decision Implementing the AB 2868 Energy Storage Program and Investment Framework and Approving AB 2868 Applications with Modification*, June 27, 2019, pp. 14-16.

1 hurried attempt by SDG&E to subject its ratepayers to these excessively costly battery storage  
2 projects despite the Commission’s prior denial.

3 **IV. SDG&E AND OTHER UTILITIES SHOULD MAKE THEIR RESIDENTIAL**  
4 **AND SMALL COMMERCIAL A/C CYCLING PROGRAMS OPT-OUT**  
5 **PROGRAMS TO MAXIMIZE PEAK LOAD REDUCTION POTENTIAL**

6 SDG&E proposes in its opening testimony to make modest enhancements to its AC Saver  
7 program, open to its residential and small commercial customers, to improve grid reliability in  
8 2022 and 2023.<sup>46</sup> The SDG&E AC Saver program exists as a very limited demand response (DR)  
9 program, achieving load reductions on the order of 5 MW when deployed.<sup>47</sup> In contrast, opt-out  
10 DR programs – where customers are provided the enabling technology, such as low-cost  
11 automated A/C temperature controllers for cycling of central A/C units<sup>48</sup> – can achieve 95  
12 percent participation.<sup>49</sup> For the DR programs to maximize their potential, they must be structured  
13 as opt-out programs that also include a substantial public education component to enable  
14 customers to understand and support the programs.

15 Air conditioning DR programs like the AC Saver program have the potential, with high  
16 customer participation, to provide a major load reduction when it matters most, on hot summer  
17 days. For example, the 2019 peak one-hour load in SDG&E service territory of 4,063 MW  
18 occurred during a heat wave on Tuesday, September 3, 2019.<sup>50</sup> One week later during a cooler  
19 period, on Tuesday, September 10, 2019, the peak load totaled only 2,898 MW.<sup>51</sup> The additional

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<sup>46</sup> SDG&E Opening Testimony – E. Bradford Mantz, p. 2.

<sup>47</sup> SDG&E, AC Saver (Summer Saver), webpage accessed May 2, 2020:  
<https://www.sdge.com/residential/savings-center/rebates/your-heating-cooling-systems/summer-saver-program>.

<sup>48</sup> Portland General Electric, *Smart Thermostat Program*, webpage accessed May 5, 2020:  
<https://www.portlandgeneral.com/residential/energy-savings/thermostats/smart-thermostat-programs>.

<sup>49</sup> FERC, *A National Assessment of Demand Response Potential*, October 2009, Table 1, p. 24.

<sup>50</sup> CAISO OASIS database, System Demand – Actual, September 3, 2019, hour ending 6 pm (1800). See:  
<http://oasis.caiso.com/mrioasis/logon.do>.

<sup>51</sup> *Ibid*, September 10, 2019, hour ending 7 pm (1900).



1 1,165 MW of demand on September 3, 2019 relative to the demand on September 10, 2019,<sup>52</sup>  
2 was entirely associated with A/C usage in response to the heat wave.

3         Cycling 95 percent of this additional 1,165 MW A/C load has the potential to reduce this  
4 cooling load by up to 500 MW in SDG&E service territory. This potential 500 MW A/C load  
5 reduction is one hundred times the 5 MW load reduction achieved with the existing SDG&E AC  
6 Saver program<sup>53</sup> on its peak day in 2018.

7         SCE has a larger and more effective residential A/C cycling program than SDG&E that  
8 offers a better measure of the DR potential of this type of program in the City. SCE achieved an  
9 average of 1 MW reduction per 1,000 participating customers in the first hour of deployment (5  
10 to 6 pm) over several heat waves in the summer of 2019.<sup>54</sup> The average SCE peak load reduction  
11 in the first hour was more than 50 MW and involved over 50,000 residential customers.<sup>55</sup>

12         The opt-out program structure provides the vehicle to enroll up to 95 percent of the  
13 customers with residential and small commercial A/C. The utilities know how to implement such  
14 an opt-out program. They used the same opt-out structure to roll out their time-of-use residential  
15 rates. California utility AC Saver programs should be converted to opt-out programs to maximize  
16 the peak load reduction potential of AC cycling.

## 17         **V. CONCLUSION**

18         CAISO testimony does not support an increase in the planning reserve margin from 15  
19 percent to 17.5 percent. The data in this reply testimony and in my opening testimony

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<sup>52</sup> 4,063 MW – 2,898 MW = 1,165 MW.

<sup>53</sup> SDG&E, AC Saver (Summer Saver), webpage accessed May 2, 2020:

<https://www.sdge.com/residential/savings-center/rebates/your-heating-cooling-systems/summer-saver-program>.

<sup>54</sup> SCE, *Southern California Edison Smart Energy Program: 2019 Load Impact Evaluation*, PowerPoint, May 4, 2020, p. 5. Summer 2019 average, 5-6 pm, number of customers = 52,239, average load reduction = 1.02 kW, total load reduction = 52,239 customers x 1.02 kW per customer = 53,284 kW (53.3 MW).

<sup>55</sup> *Ibid.*

1 demonstrate that reducing power plant outages and curbing exports achieve reliability without  
2 the additional costs imposed by needlessly increasing the planning reserve margin. SDG&E and  
3 other California utilities should not be granted authority to fast-track utility-owned battery  
4 storage capacity. SDG&E and other California IOU AC Saver programs should be opt-out  
5 programs that maximize the demand reduction potential of AC cycling.

6

7

Respectfully submitted,

8

/s/ Bill Powers, P.E

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Bill Powers, P.E. - Technical Advisor

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Protect Our Communities Foundation

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18 Dated: September 10, 2021

## **VERIFICATION**

I am an officer of The Protect Our Communities Foundation, and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 10, 2021 at San Diego, California.

*/s/ Bill Powers*

Bill Powers, Board Secretary

The Protect Our Communities Foundation

# **EXHIBIT A**

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

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

Rulemaking 19-11-009  
(Filed November 7, 2019)

**RESPONSE OF THE  
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION  
TO DATA REQUEST NUMBER PCF-CAISO-2020RA-02  
BY PROTECT OUR COMMUNITIES FOUNDATION**

**Request Date: 11/19/2020**

**Response Date: 12/8/2020**

Below are the California Independent System Operator Corporation's (CAISO) responses to Protect Our Communities Foundation (PCF) Data Request – *PCF-CAISO-2020RA-04*.

**General Objections**

The CAISO objects to the questions below as not reasonably calculated to lead to the discovery of relevant or admissible evidence. In addition, many of the questions are unduly burdensome, vague, and costly for the CAISO to respond. In the responses below, the CAISO identifies questions that are unduly burdensome and seeks to meet and confer with PCF to further refine these questions to ensure the CAISO can provide responses that are responsive to issues relevant in the resource adequacy proceeding.

In addition, to the extent possible, the CAISO provides responses to PCF's specific questions below.

**PCF Request No. 1**

Provide, for demand response resources ordered by CAISO to dispatch on August 14, 2020, August 15, 2020, and September 6, 2020:

- a) Name and CAISO ID of the resource,
- b) NQC of the resource,
- c) Time the resource was dispatched,
- d) MW level of dispatch in 5-minute intervals, and
- e) Time of termination of dispatch.

**CAISO Response to Request No. 1**

*The CAISO objects to Question 1 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. It is unduly burdensome to produce the data requested at the individual resource level and at a 5-minute granularity, and it is not relevant to the CPUC RA program. Individual resource dispatch data is not considered in the resource adequacy proceeding. In particular, the CPUC sets qualifying capacity values for demand response resources based on its Load Impact Protocols.*

*Notwithstanding the CAISO's objections, the CAISO recommends pursuing a meet and confer process to limit the scope of this question to items that are relevant to the CPUC RA proceeding and not unduly burdensome to produce.*

**PCF Request No. 2**

Provide, for August 10 - 25, 2020 and September 4-8, 2020, a) contracted imports by Resource ID in 5-minute increments, and b) delivered Imports by Resource ID in 5-minute increments.

**CAISO Response to Request No. 2**

*The CAISO objects to Question 2 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. It is unduly burdensome to produce the data requested at the individual resource level and at a 5-minute granularity, and it is not relevant to the CPUC RA program. Individual resource dispatch data is not considered in the resource adequacy proceeding.*

*Notwithstanding the CAISO's objections, the CAISO recommends pursuing a meet and confer process to limit the scope of this question to items that are relevant to the CPUC RA proceeding and not unduly burdensome to produce.*

*In addition, as noted in response to Question 2, part a), the CAISO does not track "contracted" imports by 5-minute increments.*

**PCF Request No. 3**

Provide CAISO-reported "available capacity", as reported on CAISO Today's Outlook "Demand" webpage, by 5-minute increment, from midnight August 11, 2020 to midnight August 16, 2020 and from midnight Sept 3, 2020 to midnight Sept 8, 2020.

**CAISO Response to Request No. 3**

*The CAISO objects to Question 3 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The “available capacity” reported in on the CAISO “Today’s Outlook” webpage does not provide data regarding the CPUC resource adequacy program. “Today’s Outlook” does not provide information regarding whether the “available capacity” is under contract otherwise included a CPUC RA capacity. The CAISO notes that “Today’s Outlook” is a CAISO website feature provided to the public for informational purposes. The Commission does not review the “Today’s Outlook” website feature as part of its resource adequacy program. This CAISO website feature is unrelated to setting Commission RA program rules, and PCF has not explained how the request relates to issues in this proceeding. The CAISO request that PCF explain how this requested data is relevant to the CPUC’s RA proceeding.*

**PCF Request No. 4**

Provide, for the periods midnight August 11, 2020 to midnight August 16, 2020 and midnight Sept 3, 2020 to midnight Sept 8, 2020:

- a) Individual generator unit commitments by 5-minute increments. (commitments by Resource ID), and
- b) MW produced at individual generator units by 5-minute increments (generation by Resource ID).

**CAISO Response to Request No. 4**

*The CAISO objects to Question 4 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. It is unduly burdensome to produce the data requested at the individual resource level and at a 5-minute granularity, and it is not relevant to the CPUC RA program.*

**PCF Request No. 5**

Provide, for the periods of midnight August 11, 2020 to midnight August 16, 2020, and midnight Sept 3, 2020 to midnight Sept 8, 2020, the committed operating reserves by 5-minute increments broken down as follows:

- a. Regulation Reserves
- b. Spinning Reserves
- c. Non-spinning Reserves
- d. Replacement Reserves

**CAISO Response to Request No. 5**

*The CAISO objects to Question 5 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at a 5-minute granularity is unduly burdensome to produce and not relevant to the CPUC RA program.*

*Notwithstanding these objections, please see the CAISO OASIS webpage, which provides hourly granular data for CAISO ancillary service requirements and results, including regulation, spinning and non-spinning reserves: <http://oasis.caiso.com/mrioasis/logon.do> (see Ancillary Services > AS Requirements and Ancillary Services > AS Results)*

*Please note, the CAISO does not procure “replacement reserves.”*

**PCF Request No. 6**

Provide, for the periods of midnight August 11, 2020 to midnight August 16, 2020 and midnight Sept 3, 2020 to midnight Sept 8, 2020, provide the available operating reserves by 5-minute increments broken down as follows:

- a. Regulation Reserves
- b. Spinning Reserves
- c. Non-spinning Reserves
- d. Replacement Reserves

**CAISO Response to Request No. 6**

*The CAISO objects to Question 6 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at a 5-minute granularity is unduly burdensome to produce and not relevant to the CPUC RA program.*

*Notwithstanding these objections, please see the CAISO OASIS webpage, which provides hourly granular data for CAISO ancillary service requirements and results, including regulation, spinning and non-spinning reserves: <http://oasis.caiso.com/mrioasis/logon.do> (see Ancillary Services > AS Requirements and Ancillary Services > AS Results) Please note, the CAISO does not procure “replacement reserves.”*

**PCF Request No. 7**

Describe how under-scheduling occurred in the day-ahead market for August 14-15, 2020. Describe the role and duties of the scheduling coordinator generally, and specifically in under-scheduling resources. Is there an operational reason a scheduling coordinator would under-schedule resources to meet a day-ahead forecast demand?



**CAISO Response to Request No. 7**

*The CAISO objects to Question 7 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding.*

*Notwithstanding these objections, see the CAISO-CPUC-CEC Preliminary Root Cause Analysis <http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf>. The CAISO is currently preparing its final Root Cause Analysis, which will address this issue in more detail.*

*See the CAISO Division of Market Monitoring's Report on system and market conditions, issues and performance, Section 3.3 re: underscheduling:*

*<http://www.caiso.com/Documents/ReportonMarketConditionsIssuesandPerformanceAugustandSeptember2020-Nov242020.pdf>.*

*Finally, see CAISO tariff section 4.5 regarding the role and responsibilities of CAISO scheduling coordinators: <http://www.caiso.com/Documents/Section4-Roles-and-Responsibilities-asof-Dec1-2020.pdf>*

**PCF Request No. 8**

- a) Describe specific problem(s) that led to the alleged forced outage of Ormond Beach Unit 1, identified by CAISO in its "Aug13-16-2020\_CAISO-Balancing-Authority-Area-Resource-Outages" xls spreadsheet, from 6:30 pm – 8:54 pm on Aug. 14, 2020, and the actions taken at the plant to bring the Unit 1 back online at full capacity at 8:54 pm;
- b) Confirm that Ormond Beach Unit 1 did not experience a forced outage on the afternoon of August 14, 2020 but instead was beginning to ramp-up on the afternoon of August 14, 2020, per the Ormond Beach Unit 1 hour-by-hour MW output shown in the November 16, 2020 CAISO response to PCF-CAISO-2020RA-02 (xls spreadsheet attachment);
- c) Identify at what day/time Ormond Beach Unit was dispatched on August 14, 2020;
- d) Explain why Ormond Beach Unit 1 was not dispatched on August 13, 2020 to be at full NQC by the afternoon of August 14, 2020, and
- f) Explain what factors resulted in Ormond Beach Unit 2 being dispatched day-ahead on August 13th and operating near its NQC on the afternoon of August 14, 2020.

**CAISO Response to Request No. 8**

*The CAISO objects to Question 8 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level is*

*not relevant to the CPUC RA program. Regarding parts a) and b), the CAISO requests that PCF explain why this information should come from the CAISO rather than the unit owner, which is in better position to provide a detailed response. The CAISO provides more detailed objections and responses below:*

- a) The “specific problem(s)” that lead to an individual unit forced outage are not relevant to the CPUC RA proceeding. The CPUC RA proceeding does not consider the causes for individual unit forced outages.*
- b) The CAISO previously provided a list of all forced outage for August 14 in response to PCF’s Data Request No. 1.*
- c) The specific timing details regarding an individual unit dispatch are not relevant to the CPUC RA proceeding.*
- d) Please see the outage data previously provided in the CAISO’s response to PCF Data Request set No. 1 (outage date can also be accessed at the following link: <http://www.caiso.com/Documents/Aug13-16-2020-CAISO-Balancing-Authority-Area-Resource-Outages.xlsx>). Ormond Beach Unit 1 was not dispatched on August 13, 2020 to be at full NQC by the afternoon of August 14, 2020, because it was on a forced outage. On August 14, Ormond Unit 1 was in the process starting-up and returning from a prior forced outage due to plant trouble that ended the late evening on August 13. Due to Ormond Unit 1’s prior outage and long start-up time, Ormond Unit 1 did not get committed in the Day-Ahead Market run on August 13 for August 14. However, after the Day-Ahead Market, the CAISO instructed Ormond Unit 1 to start up for August 14. At 16:30, as Ormond Unit 1 was in the process of starting up it was generating less than its minimum operating level of 100MW, the resource informed the CAISO of forced outage.*
- e) Ormond Beach Unit 2 was dispatched based on normal market processes.*

### **PCF Request No. 9**

The November 16, 2020 CAISO response to PCF-CAISO-2020RA-02 (xls spreadsheet attachment) indicates that Alamitos 4 (336 MW NQC) and Redondo Beach 5 (175 MW NQC) were producing no power during the afternoon of August 14, 2020. CAISO has not indicated that Alamitos 4 was in planned or forced outage on August 14, 2020.

- A) Explain why Alamitos 4 was not dispatched a day-ahead to be at or near full NQC MW by the afternoon of August 14, 2020, and
- B) Identify the dispatch coordinator for Alamitos 4.

### **CAISO Response to Request No. 9**

*The CAISO objects to Question 9 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level is*

*not relevant to the CPUC RA program. The CAISO provides more detailed objections and responses below:*

- A) Alamos 4 was on planned outage on August 14. Please see the outage data previously provided in the CAISO's response to PCF Data Request set No. 1 (outage data can also be accessed at the following link: <http://www.caiso.com/Documents/Aug13-16-2020-CAISO-Balancing-Authority-Area-Resource-Outages.xlsx>)*
- B) The dispatch coordinator for any individual unit is not relevant to the CPUC RA program.*

### **PCF Request No. 10**

The CAISO "Aug13-16-2020\_CAISO-Balancing-Authority-Area-Resource-Outages" xls spreadsheet indicates Redondo Beach 5 experienced "plant trouble" at 02:33 on August 13, 2020, went into forced outage, and that the plant trouble and testing continued until 23:59 on August 16, 2020.

- A) Describe the specific problem(s) that led to the forced outage of Redondo Beach 5,*
- B) Confirm that Redondo Beach 5 was attempting to come online in response to a dispatch order to be generating at full NQC by the afternoon of August 14, 2020, and*
- C) Identify what scheduling coordinator issued the Redondo Beach 5 dispatch order.*

### **CAISO Response to Request No. 10**

*The CAISO objects to Question 10 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level is not relevant to the CPUC RA program. Regarding parts a) and b), the CAISO requests that PCF explain why this information should come from the CAISO rather than the unit owner, which is in better position to provide a detailed response. The CAISO provides more detailed objections and responses below:*

- A) The "specific problem(s)" that lead to an individual unit forced outage are not relevant to the CPUC RA proceeding. The CPUC RA proceeding does not consider the causes for individual unit forced outages.*
- B) Please see the outage data previously provided in the CAISO's response to PCF Data Request No. 1. Redondo Beach Unit moved from a forced outage to a planned outage (for unit testing) the morning of 8/13. The unit later returned to forced outage at 18:20 on 8/13. The unit remaining on partial forced outage until 8/16.*
- C) The CAISO issues dispatch instructions, not scheduling coordinators.*

### **PCF Request No. 11**

Describe specific problem(s) that led to forced outage of Blythe Energy Center from 2:57 pm – 5:57 pm on Aug. 14, 2020, and the actions taken at the plant to bring Blythe Energy Center back online at full capacity at 5:57 pm on Aug. 14, 2020.

### **CAISO Response to Request No. 11**

*The CAISO objects to Question 11 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level is not relevant to the CPUC RA program. The “specific problem(s)” that lead to an individual unit forced outage are not relevant to the CPUC RA proceeding. The CAISO requests that PCF explain why this information should come from the CAISO rather than the unit owner, which is in better position to provide a detailed response. The CPUC RA proceeding does not consider the causes for individual unit forced outages.*

### **PCF Request No. 12**

Describe the specific problem(s) that led to the indication in CAISO’s daily generation outage report that Diablo Canyon Unit 1 was in forced outage, starting Aug. 12, 2020 and ending Aug. 16, 2020, although no MW derating was indicated during that time. Describe what action was taken at the plant to lift the Unit 1 forced outage indication.

### **CAISO Response to Request No. 12**

*The CAISO objects to Question 12 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level is not relevant to the CPUC RA program. The “specific problem(s)” that lead to an individual unit forced outage are not relevant to the CPUC RA proceeding. The CAISO requests that PCF explain why this information should come from the CAISO rather than the unit owner, which is in better position to provide a detailed response. The CPUC RA proceeding does not consider the causes for individual unit forced outages.*

### **PCF Request No. 13**

Describe the specific problem(s) that caused four 100 MW Sentinel LMS100 units to be in forced outage from Sept. 4-7, 2020 as indicated in the CAISO daily generation outage report for those days.

### **CAISO Response to Request No. 13**

*The CAISO objects to Question 13 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested at the individual resource level*

*is not relevant to the CPUC RA program. The CAISO requests that PCF explain why this information should come from the CAISO rather than the unit owner, which is in better position to provide a detailed response. The “specific problem(s)” that lead to an individual unit forced outage are not relevant to the CPUC RA proceeding. The CPUC RA proceeding does not consider the causes for individual unit forced outages.*

#### **PCF Request No. 14**

DOE Form OE-417 Electric Emergency and Disturbance Report, Calendar Year 2020, indicates that CAISO initiated controlled load shedding of 200 MW in Southern California at 3 pm on August 15, 2020, and terminated this load shedding event at 7:45 pm. Describe what precipitated this 200 MW load shedding event, and which Southern California LSEs were affected, number of affected customers in each LSE, and duration of the outage in each LSE.

#### **CAISO Response to Request No. 14**

*The CAISO-CPUC-CEC Preliminary Root Cause Analysis describes the August 15 load shedding event in detail. <http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf>. The CAISO does not have information regarding individual LSE or customer outages.*

#### **PCF Request No. 15**

In the Oct. 6, 2020 root cause report, p. 30, the authors identify that the single worst contingency assumed by CAISO “tends to be” either Diablo Canyon or the Pacific DC Intertie (LADWP). Clarify what “tends to be” means in this context. Clarify how much MW capacity CAISO assumes is curtailed from these N-1 resources in calculating its minimum operating reserve margin (ORM) need.

#### **CAISO Response to Request No. 15**

*NERC defines “Most Severe Single Contingency” as “The Balancing Contingency Event, due to a single contingency identified using system models maintained within the Reserve Sharing Group (RSG) or a Balancing Authority’s area that is not part of a Reserve Sharing Group, that would result in the greatest loss (measured in MW) of resource output used by the RSG or a Balancing Authority that is not participating as a member of a RSG at the time of the event to meet Firm Demand and export obligation (excluding export obligation for which Contingency Reserve obligations are being met by the Sink Balancing Authority).” The CAISO’s Most Severe Single Contingency tends to be either loss of Diablo Canyon or the Pacific DC Intertie, depending on system conditions.*

### **PCF Request No. 16**

Clarify where in CAISO tariffs or reliability standards CAISO states it must initiate controlled load shedding if the ORM drops below 6%, and not the NERC 3% ORM trigger level for controlled load shedding. Explain the rationale for the 6% ORM trigger level for controlled load shedding.

### **CAISO Response to Request No. 16**

*As explained on page 30 of the CAISO-CPUC-CEC Preliminary Root Cause Analysis, NERC standard BAL-002-WECC-03 requires the CAISO “to carry reserves equal to 6% of the load, consistent with WECC contingency requirements that operating reserves be equal to the greater of: (1) the most severe single contingency, or (2) the sum of three percent of hourly integrated load plus three percent of hourly integrated generation.*

*At page 35, the Preliminary Root Cause Analysis further explained as follows:*

*At 6:38 pm, the CAISO declared a Stage 3 Emergency because it was deficient in meeting its reserve requirement. The CAISO was not able to cure the deficiency with generation, because all generation was already online, and solar was rapidly declining while demand remained high. Because the CAISO was no longer able to maintain sufficient spinning reserves to address the loss of significant generation or transmission, the load shed was necessary to allow the CAISO to recover and maintain its reserves. If the CAISO continued to operate with the deficiency in spinning reserves, the CAISO risked causing uncontrolled load shed and destabilizing the rest of the Western grid if during this time it lost significant generation or transmission. Consequently, the CAISO ordered two phases of controlled load shed of 500 MW each, based on a pro-rata share across the CAISO footprint for distribution utility companies.*

### **PCF Request No. 17**

Provide, for August 1, 2020 through Sept. 20, 2020 (same date range as Slides 22 and 23), graphics with the same “volume of exports” content information as was included for Aug. 13-15, 2020 only in Slide 10 of the October 9, 2020 CAISO PowerPoint “August heatwave update” by Guillermo Bautista Alderete, Ph.D., Director, Market Analysis and Forecasting.

### **CAISO Response to Request No. 17**

*The CAISO objects to Question 17 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested is unduly burdensome to produce and not relevant to the CPUC RA program. The CAISO produced the data presented in October 9, 2020 “August Heatwave Update” at a considerable effort and providing the additional data for the date range mentioned would be extremely burdensome on CAISO staff as*

*it would require detailed logic and mapping to produce the requested information. Furthermore, export data is not considered as part of the CPUC's RA proceeding.*

**PCF Request No. 18**

Provide, for August 1, 2020 through Sept. 20, 2020 (same date range as Slides 22 and 23), graphics with the same “volume of exports through Palo Verde” content information as was included for Aug. 13-15, 2020 only in Slide 22 of the October 9, 2020 CAISO PowerPoint “August heatwave update” by Guillermo Bautista Alderete, Ph.D., Director, Market Analysis and Forecasting.

**CAISO Response to Request No. 18**

*The CAISO objects to Question 18 as not reasonably calculated to lead to discovery of relevant or admissible evidence in the RA proceeding. The data requested is unduly burdensome to produce and not relevant to the CPUC RA program. The CAISO produced the data presented in October 9, 2020 “August Heatwave Update” at a considerable effort and providing the additional data for the date range mentioned would be extremely burdensome on CAISO staff as it would require detailed logic and mapping to produce the requested information f. Furthermore, export data is not considered as part of the CPUC's RA proceeding.*

**PCF Request No. 19**

Define “cleared imports” and “uncleared imports” as those terms are used in Slide 22 of the October 9, 2020 CAISO PowerPoint “August heatwave update” by Guillermo Bautista Alderete, Ph.D., Director, Market Analysis and Forecasting.

**CAISO Response to Request No. 19**

*Cleared imports” refer to imports that bid into and accepted in a CAISO market (i.e., day-ahead market, real-time market)  
“Uncleared imports” refer to imports that bid into a CAISO market, but are not accepted.*

**PCF Request No. 20**

Some of the SoCal OTC units have higher NQC MW ratings than their MW rated capacity, other units have the same NQC and MW capacity ratings, and others have lower NQC MW ratings than their MW rated capacity. The values are compared in the table below. Explain the difference between the CAISO NQC of these units and the rated MW capacity of these units.

OTC Unit	CAISO NQC rating (MW)	CEC unit capacity rating (MW) <sup>1</sup>
Huntington Beach 2	226	215
Alamitos 3	332	326
Alamitos 4	336	324
Alamitos 5	498	485
Redondo Beach 5	179	179
Redondo Beach 6	175	175
Redondo Beach 8	496	496
Ormond Beach 1	741	806
Ormond Beach 2	750	806

**CAISO Response to Request No. 20**

*The CAISO establishes NQC values based on the QC values provided by Local Regulatory Authorities subject to any reductions consistent with 40.4 of the CAISO tariff. The CAISO cannot speculate regarding the CEC unit capacity ratings.*

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<sup>1</sup> California Energy Commission, *Tracking Progress - Once-Through Cooling Phase-out*, April 2019, p. 4: [https://www.energy.ca.gov/sites/default/files/2019-12/once\\_through\\_cooling\\_ada.pdf](https://www.energy.ca.gov/sites/default/files/2019-12/once_through_cooling_ada.pdf).



## **EXHIBIT B**

2019 Generating Unit Statistical Brochure -- All Units Reporting

NOTE: This brochure contains data on units reporting events only. For a review of statistics containing units that reported events, see the brochure "2019 Generating Unit Statistical Brochure -- Units Reporting Events".  
 (The differences between statistics with or with events will appear in equations needing derating information such as EAF, EFOR, and other equations. The equations are more accurate if events are reported.)

Unit Type	4W Trb/Gen Nameplate	# of Units	Unit-Years
FOSSIL All Fuel Types	All Sizes	957	958
FOSSIL All Fuel Types	001-099	195	195
FOSSIL All Fuel Types	100-199	204	203
FOSSIL All Fuel Types	200-299	107	107
FOSSIL All Fuel Types	300-399	89	90
FOSSIL All Fuel Types	400-599	174	174
FOSSIL All Fuel Types	600-799	119	119
FOSSIL All Fuel Types	800-999	56	56
FOSSIL All Fuel Types	1000 Plus	13	13
FOSSIL Coal Primary	All Sizes	558	549
FOSSIL Coal Primary	001-099	59	54
FOSSIL Coal Primary	100-199	102	101
FOSSIL Coal Primary	200-299	71	69
FOSSIL Coal Primary	300-399	49	50
FOSSIL Coal Primary	400-599	120	118
FOSSIL Coal Primary	600-799	103	102
FOSSIL Coal Primary	800-999	42	42
FOSSIL Coal Primary	1000 Plus	12	12
FOSSIL Oil Primary	All Sizes	48	46
FOSSIL Oil Primary	001-099	15	15
FOSSIL Oil Primary	100-199	7	7
FOSSIL Oil Primary	200-299	***	***
FOSSIL Oil Primary	300-399	9	9
FOSSIL Oil Primary	400-599	6	6
FOSSIL Oil Primary	600-799	7	5
FOSSIL Oil Primary	800-999	3	3
FOSSIL Gas Primary	All Sizes	284	280
FOSSIL Gas Primary	001-099	91	91
FOSSIL Gas Primary	100-199	71	70
FOSSIL Gas Primary	200-299	32	32
FOSSIL Gas Primary	300-399	29	28
FOSSIL Gas Primary	400-599	44	43
FOSSIL Gas Primary	600-799	10	10
FOSSIL Gas Primary	800-999	7	6
FOSSIL Lignite Primary	All Sizes	17	17
FOSSIL Oil/Gas Primary	001-099	86	86
FOSSIL Oil/Gas Primary	100-199	98	97
FOSSIL Oil/Gas Primary	200-299	32	32
FOSSIL Oil/Gas Primary	300-399	38	37
FOSSIL Oil/Gas Primary	400-599	50	49
FOSSIL Oil/Gas Primary	600-799	15	15
FOSSIL Oil/Gas Primary	800-999	10	9
FOSSIL Oil/Gas Primary	All Sizes	330	326
NUCLEAR All Types	All Sizes	95	95
NUCLEAR All Types	400-799	9	9
NUCLEAR All Types	800-999	33	33
NUCLEAR All Types	1000 Plus	53	53
NUCLEAR PWR	All Sizes	60.00	60
NUCLEAR PWR	400-799	3.00	3
NUCLEAR PWR	800-999	22.00	22
NUCLEAR PWR	1000 Plus	35.00	35

ART	SR	NCF	NOF	SF	AF	EAF	FOR	EFOR	EFORa	SOF	FOF	UOF	EUOF	EUOR	POF	MOF
280.12	97.74	39.25	67.92	52.68	80.56	77.63	9.7	12.87	10.45	13.78	5.66	10.13	12.31	19.4	9.31	4.47
180.45	99.29	29.63	62.39	46.37	83.3	79.47	12.08	15.31	11.34	10.33	6.37	11.02	13.07	22.56	5.68	4.65
200.51	98.13	25.35	60.01	41.22	79.16	76.63	14.65	17.83	12.88	13.76	7.08	11.7	13.63	25.31	9.15	4.62
335.95	97.39	37.77	64.09	59.5	82.35	79.43	8.52	11.39	9.67	12.11	5.54	9.78	12.11	17.29	7.87	4.23
225.35	97.64	27.95	58.74	48.01	80.44	77.55	7.16	11.23	8.65	15.85	3.7	8.18	10.52	18.55	11.38	4.47
362.04	96.59	38.64	66.41	58.11	78.28	75.56	9.76	12.91	11.14	15.44	6.28	10.56	12.84	18.56	11.16	4.28
502.35	96.37	46.82	73.23	63.67	80.84	77.85	6.58	9.9	8.83	14.68	4.48	8.51	11.07	15.17	10.65	4.03
463.85	96.41	44.51	69.84	63.37	82.61	80.75	4.49	6.49	5.71	14.4	2.98	7.34	9.02	12.68	10.04	4.36
517.27	92.36	40.81	72.23	54.98	69.19	65.46	9.27	12.67	11.22	25.19	5.62	14.44	17.07	24.49	16.37	8.82
470.24	97.04	47.48	70.94	63.38	81.38	78.58	7.91	10.46	9.26	13.18	5.44	9.72	11.76	16.04	8.9	4.28
233.59	99.38	34.05	69.7	47.65	89.89	85.32	6.6	8.94	7.08	6.74	3.37	5.68	7.44	13.86	4.43	2.32
505.52	98.53	36.46	66.91	54.62	77.21	74.87	14.12	16.3	13.88	13.81	8.98	14.18	15.81	22.91	8.61	5.2
486.81	96.87	42.99	68.33	64.06	83.32	80.77	7.9	10.06	8.92	11.19	5.49	10.55	12.28	16.41	6.13	5.05
338.93	96.33	37.85	66.07	57.51	80.44	76.48	6.84	11.7	9.76	15.34	4.22	9.66	13.01	19.2	9.89	5.44
503.71	96.29	48.34	69.07	69.82	81.19	78.54	7.4	10.03	9.23	13.23	5.88	8.86	11.06	14.02	9.95	3.28
560.54	97.29	52.4	74.31	70.48	81.72	79.24	6.16	8.52	7.86	13.66	4.63	8.4	10.4	13.18	9.89	3.77
735.54	94.37	50.26	70.87	70.82	81.67	79.94	4.95	6.6	6.16	14.64	3.69	8.64	10.19	12.78	9.68	4.95
540.51	92.74	43.37	72.51	59.11	68.95	65.14	9.34	12.64	11.54	24.96	6.09	13.88	16.51	22.62	17.17	7.79
104.4	98.99	4.37	42.16	22.32	80.74	77.81	21.8	29.17	14	13.04	6.22	10.86	13.44	39.16	8.4	4.64
88.42	99.48	33.57	53.36	53.03	77.06	70.58	18.09	26.58	20.54	11.23	11.72	19.99	26.46	35.2	2.96	8.27
408.06	96.91	14.63	57	21.94	73.89	71.99	40.68	45.19	26.55	11.07	15.04	16.44	18.27	47.34	9.67	1.39
187.56	100	6.24	31.04	19.8	86.04	85.53	5.11	6.1	4.5	12.89	1.07	3.7	3.91	16.59	10.26	2.63
15.44	100	0.15	18.57	0.79	84.99	83.63	40.61	43.65	17.39	14.47	0.54	1.59	1.72	67	13.42	1.05
21.64	97.65	0.71	35.25	2.05	88.02	84.47	46.54	70.33	18.28	10.19	1.79	6.76	9.76	82.77	5.22	4.97
24.38	83.25	0.34	37.43	0.93	77.96	77.06	25.52	48.35	17.53	21.73	0.32	5.64	6.17	87.22	16.41	5.32
112.73	98	14.35	44.58	30.06	77.22	74.58	16.89	21.72	13.47	16.68	6.11	11.66	13.95	32.26	11.12	5.55
107.97	98.72	12.58	44.44	22.8	76.82	75.02	27.2	30.13	16.63	14.66	8.52	16.12	17.32	43.72	7.06	7.6
89.84	98.02	13.24	46.37	28.1	81.01	78.44	14.38	19.61	11.35	14.28	4.72	9.07	11.4	29.24	9.93	4.35
185.05	98.33	23.1	48.53	46.86	80.96	77.27	7.44	12.69	9.21	15.28	3.76	6.9	10.54	18.93	12.14	3.13
122.04	98.44	13.78	38.71	35.26	77.91	75.94	10.03	13.3	9.04	18.16	3.93	7.67	9.11	20.89	14.41	3.75
125.25	97.2	13.6	44.72	30.65	68.58	65.89	23.41	28.12	19.13	22.05	9.37	17.14	19.48	39.68	14.27	7.78
183.99	90.01	16.16	51.11	29.31	67.77	60.15	14.14	30.47	21.45	27.4	4.83	11.52	19.12	40.3	20.71	6.69
45.27	99.62	7.34	32.36	22.76	84.39	82.81	3.4	5.63	3.01	14.81	0.8	4.21	5.69	19.68	11.4	3.41
957.73	92.74	64.06	76.99	83.75	87.05	82.3	4.13	7.67	7.45	9.34	3.61	5.14	8.4	9.45	7.8	1.54
101.39	98.97	16.54	47.48	27.37	76.85	74.35	24.75	29.17	16.44	14.14	9	16.71	18.7	41.57	6.44	7.7
94.48	98.02	13.34	47.07	27.61	80.44	77.93	16.71	21.81	12.49	14.02	5.54	9.65	11.94	30.67	9.91	4.12
185.05	98.33	23.1	48.53	46.86	80.96	77.27	7.44	12.69	9.21	15.28	3.76	6.9	10.54	18.93	12.14	3.13
128.35	98.57	11.99	37.56	31.77	79.74	78.1	9.37	12.34	8.22	16.97	3.28	6.78	7.94	20.31	13.48	3.49
122.05	97.26	12	44.63	26.93	70.62	68.1	23.49	28.2	18.23	21.11	8.27	15.21	17.27	39.89	14.17	6.94
144.82	91.74	11.08	50.63	19.82	74.82	68.62	15.98	33.72	19.12	21.41	3.77	9.86	15.86	45.27	15.32	6.09
44.51	98.93	5	32.46	15.55	82.26	80.91	3.96	7.12	3.41	17.09	0.64	4.68	5.85	26.95	13.06	4.04
111.77	98.12	12.52	44.41	28.99	77.7	75.03	17.44	22.56	13.61	16.17	6.12	11.55	13.88	33.03	10.75	5.43
5,659.60	98.62	92.63	99.55	93.24	93.24	91.44	1.5	1.92	1.92	5.34	1.42	1.55	2.45	2.59	5.21	0.14
6,390.08	100	93.3	98.18	95.2	95.2	92.32	1.4	2.11	2.11	3.44	1.35	1.35	2.26	2.34	3.44	0
5,756.13	97.93	93.92	99.93	94.11	94.11	92.7	1.5	1.89	1.89	4.46	1.44	1.6	2.49	2.6	4.29	0.17
5,505.86	98.66	91.97	99.48	92.39	92.39	90.52	1.51	1.91	1.91	6.19	1.42	1.56	2.47	2.62	6.05	0.14
6,220.15	97.74	92.26	99.7	92.74	92.74	91.41	1.59	1.91	1.91	5.76	1.5	1.53	2.14	2.27	5.73	0.03
8,387.33	100	96.63	101.16	95.75	95.75	93.16	2.16	2.24	2.24	2.14	2.11	2.11	2.54	2.6	2.14	0
7,149.18	96.61	94.49	100.37	94.24	94.24	93.43	1.37	1.62	1.62	4.45	1.3	1.3	1.71	1.79	4.45	0
5,608.56	97.95	91.02	99.31	91.56	91.56	90.01	1.68	2.06	2.06	6.88	1.57	1.62	2.38	2.55	6.82	0.05

WSF	WAF	WEAF	WFOR	WEFOR	WSOF	WFOF
57.78	79.88	77.15	8.05	11.09	15.06	5.06
47.49	84.4	80.67	10.84	14.2	9.83	5.78
42.25	79.08	76.61	14.81	17.83	13.57	7.35
58.93	82.62	79.77	8.42	11.23	11.97	5.42
47.58	80.21	77.37	7.11	11.09	16.15	3.64
58.19	78.32	75.63	9.75	12.84	15.39	6.29
63.94	80.86	77.92	6.53	9.8	14.67	4.47
63.74	82.66	80.8	4.43	6.41	14.39	2.95
56.5	69.33	65.6	9.49	12.93	24.74	5.93
66.93	80.63	78	7.06	9.56	14.29	5.08
48.86	87.7	85.84	6.34	9.03	5.99	3.31
54.49	76.88	74.5	14.86	17.04	13.61	9.51
62.92	83.58	81.06	8.06	10.18	10.9	5.51
57.29	80.33	76.39	6.85	11.63	15.46	4.21
69.98	81.26	78.63	7.29	9.86	13.23	5.51
70.52	81.77	79.29	6.13	8.51	13.62	4.6
70.92	81.79	80.08	4.87	6.5	14.57	3.63
59.81	69.16	65.36	9.54	12.91	24.53	6.31
10.36	82.69					

NUCLEAR BWR	All Sizes	28.00	28	5,249.95	100	94.15	99.9	94.27	94.27	91.64	1.36	1.91	1.91	4.43	1.3	1.62	2.94	3.07	4.11	0.33	94.25	94.25	91.68	1.41	1.92	4.41	1.34		
NUCLEAR BWR	400-799	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
NUCLEAR BWR	800-999	9.00	9	4,643.88	100	94.41	100.14	94.36	94.36	92.08	1.82	2.4	2.4	3.89	1.75	2.16	3.5	3.63	3.48	0.4	94.27	94.27	92.02	1.88	2.47	3.92	1.8		
NUCLEAR BWR	1000 Plus	17.00	17	5,619.50	100	94.34	100.06	94.3	94.3	91.8	1.16	1.54	1.54	4.59	1.11	1.42	2.62	2.74	4.28	0.31	94.28	94.28	91.76	1.25	1.63	4.53	1.19		
NUCLEAR CANDU	All Sizes	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
JET ENGINE	All Sizes	201	201	4.31	99.01	4.56	81.03	3.91	89.59	86.87	40.87	42.79	9.36	6.77	3.64	6.22	6.56	55.32	4.19	2.58	5.63	89.37	85.42	37.67	39.94	6.32	4.31		
JET ENGINE	001-019	22	22	5.19	98.69	0.07	9.56	0.81	92.97	92.93	40.76	40.79	15.87	6.48	0.55	2.44	2.45	75.31	4.59	1.89	0.73	92.9	92.87	44.07	44.1	6.52	0.58		
JET ENGINE	20 Plus	179	179	4.29	99.03	4.75	81.4	4.29	89.16	86.12	40.87	42.82	9.5	6.81	4.03	6.69	7.08	54.7	4.14	2.66	5.83	89.22	85.1	37.64	39.92	6.31	4.46		
GAS TURBINE	All Sizes	589	589	8.56	98.64	5.01	69.74	5.27	87.56	84.84	50.52	51.35	11.66	7.06	5.38	8.35	8.5	61.86	4.09	2.97	7.19	88.75	85.6	34.19	35.16	7.52	3.74		
GAS TURBINE	001-019	83	83	3.48	96.13	0.71	66.15	1.11	85.21	84.3	89.36	89.46	20.56	5.51	9.28	12.81	12.9	92.11	1.98	3.53	1.07	85.29	84.35	89.49	89.59	5.58	9.13		
GAS TURBINE	020-049	115	115	5.68	99.09	4.87	83.24	4.17	86	83.5	66.88	67.19	13.71	5.58	8.42	11.23	11.33	73.17	2.77	2.81	5.85	87.04	84.46	54.73	55.17	5.89	7.07		
GAS TURBINE	50 Plus	391	391	10.03	98.74	5.18	68.75	6.43	88.48	85.34	36.61	37.86	9.62	7.8	3.71	6.61	6.8	51.54	4.9	2.9	7.53	89.03	85.75	29.98	31.07	7.74	3.23		
COMBINED CYCLE	All Sizes	290	289	90.45	98.58	55.32	81.87	55.56	88.27	85.08	3.83	4.68	3.69	9.52	2.21	4.27	4.98	8.3	7.46	2.06	67.57	88.22	84.77	2.34	3.22	10.16	1.62		
HYDRO	All Sizes	905	905	77.41	99.87	31.39	51.3	62.1	78.96	78.58	10.96	11.04	9.39	13.22	7.82	9.49	9.56	13.08	11.55	1.67	61.19	80.53	80.2	5.33	5.43	15.95	3.52		
HYDRO	001-029	335	335	267.24	99.8	35.46	52.28	61.47	73.38	73.1	18.7	18.8	17.17	12.15	14.47	16.26	16.36	20.66	10.35	1.8	67.83	80.18	79.96	10.35	10.49	11.75	8.07		
HYDRO	30 Plus	570	570	55.26	99.87	31.11	51.22	62.47	82.16	81.73	5.9	5.97	4.9	13.84	4.01	5.6	5.66	8.13	12.24	1.6	60.74	80.55	80.22	4.92	5.02	16.23	3.21		
PUMPED STORAGE	All Sizes	111	111	10.17	99.95	7.79	50.09	28.27	79.12	78.82	8.15	8.24	5.69	17.19	3.69	6.12	6.19	12.96	14.76	2.43	15.56	76.78	76.02	9.08	9.44	20.08	3.14		
MULTI-BOILER/MULTI-TURBINE	All Sizes	20	20	305.10	96.75	25.12	56.24	52.59	82.60	74.13	9.23	18.85	14.32	12.05	5.35	8.97	15.06	24.08	8.43	3.62	44.67	84.83	80.22	5.92	11.48	12.36	2.81		
DIESEL	All Sizes	122	122	11.07	99.11	12.54	71.08	9.76	90.92	90.10	34.29	35.02	11.28	3.99	5.09	6.29	6.55	40.24	2.80	1.19	17.64	92.18	90.12	21.48	23.71	2.99	4.82		

\*\*Caution: EFOR and WEFOR values may be low since deratings during reserve shutdown periods may not have been reported for a large number of these units.

\*\*\* The two methods for calculating combined cycle units is not available at this time.

\*\*\*\* Less than three generating companies are reporting this type of unit. To retain confidentiality of the data, no data is reported here.



# **EXHIBIT C**

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

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

Rulemaking 19-11-009  
(Filed November 7, 2019)

**RESPONSE OF THE  
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION  
TO DATA REQUEST NUMBER PCF-CAISO-2020RA-02  
BY PROTECT OUR COMMUNITIES FOUNDATION**

**Request Date: 11/12/2020**

**Response Date: 12/10/2020**

Below are the California Independent System Operator Corporation's (CAISO) responses to Protect Our Communities Foundation (PCF) Data Request – [PCF-CAISO-2020RA-03](#).

**General Objections**

*The CAISO objects to the questions below as not reasonably calculated to lead to the discovery of relevant or admissible evidence. Prior to providing the responses and objections below, the CAISO sought to request additional information regarding the relevance of these data requests to the Commission's resource adequacy (RA) proceeding. The CAISO met with Protect our Communities Foundation (PCF) on November 25, 2020 and again on December 3, 2020 to determine the relevance of the questions below to the Commission's resource adequacy proceeding and to obtain additional details regarding the information requested. The CAISO continues to object to the questions below and requests that PCF explain in writing how the information requested below relates to the CPUC RA proceeding. However, the CAISO provides substantive responses to the greatest extent possible.*

**PCF Request No. 1**

Verify that the Resource ID list in the CAISO 2021 Local Capacity Technical Study – Final Report (May 1, 2020), Attachment A – List of physical resources by PTO, local area and market ID (pp. 157-199), is the complete universe of generator units used by CAISO in August and September 2020, combined with daily generator and transmission outage reports, to determine “available capacity” as shown on CAISO Today's Outlook “Demand”:

<http://www.caiso.com/TodaysOutlook/Pages/default.aspx> and operating reserve margins:

<http://oasis.caiso.com/mrioasis/logon.do>. If this list of resources in the 2021 Local Capacity

*Technical Study* is not complete, then provide a complete list of generator units in CAISO by Resource ID. Include owner name and operator name for each Resource ID.

**CAISO Response to Request No. 1**

*The CAISO objects to the question as not reasonably calculated to lead to the discovery of relevant or admissible evidence in the RA proceeding. In particular, the CAISO notes that “Today’s Outlook” is a CAISO website feature provided to the public for informational purposes. The Commission does not review the “Today’s Outlook” website feature as part of its resource adequacy program. This CAISO website feature is unrelated to setting Commission RA program rules and PCF was unable to explain how the request relates to issues in this proceeding. The “Today’s Outlook” data does not provide information regarding the amount of resources that are under RA contracts.*

*The CAISO also objects to the phrase “complete universe of generator units used by the CAISO in August and September 2020.” This phrase is vague and ambiguous. It is electrically impossible to determine the “complete universe of generator units used by the CAISO” because the CAISO is part of a larger networked system and a substantial portion of CAISO load is served by resources imported from external networked systems or is not otherwise resource specific. Thus, the CAISO does not know the identity of every unit that may have supported service to the CAISO during these months. As written, the question requests information outside of the CPUC RA proceeding, as the “complete universe of generator units used by the CAISO” has no direct relationship with the generator units under contract pursuant to the CPUC RA program. This request is also potentially unduly burdensome to the extent it requests a full list of generator units that were scheduled or awarded bids in August and September.*

*Notwithstanding these objections, the list of resources in the 2021 Local Capacity Technical Study is not a complete list of resources within the CAISO balancing area as it only lists generator units that are within defined local areas. Please see the CAISO response to Question 2 below more comprehensive lists of resources.*

**PCF Request No. 2**

Provide a reference list with Resource IDs matched to the plant names, geographic locations, and transmission lines associated with each generator unit. For each row of the Resource ID reference list, provide a column that contains the energy source for the generator units.

### **CAISO Response to Request No. 2**

*The CAISO objects to the question as not reasonably calculated to lead to the discovery of relevant or admissible evidence in the RA proceeding. Individual generator names, locations, Resource IDs, and “associated” transmission lines are not considered in the Commission’s RA proceeding, with the exception that local area needs and resource requirements are considered in setting local RA requirements. During the November 25 and December 3 discussions, PCF was unable to explain why it believes individual generator data is relevant to the RA program.*

*Notwithstanding these objections, PCF can access the Net Qualifying Capacity generator list at the link below. This list provides the Resource ID, name and location for generators that are qualified to provide Net Qualifying Capacity for RA purposes. The Net Qualifying Capacity List is available at the following link:*

<http://www.caiso.com/Documents/NetQualifyingCapacityList-2021.xlsx>

*In addition, with this data request, the CAISO provides its most recent Full Network Model release data. The Full Network Model Release data includes all generator units in the CAISO balancing area, aggregated resources, and dynamic import resources. The Full Network Model data is available at the following link:*

[http://www.caiso.com/Documents/FullNetworkModel\\_PricingNodeMapping\\_Based\\_FullNetworkModel\\_ReleaseDB20M12.xls](http://www.caiso.com/Documents/FullNetworkModel_PricingNodeMapping_Based_FullNetworkModel_ReleaseDB20M12.xls)

*Finally, the “Master Control Area Generator List” is available from the OASIS Atlas Reference menu.*

### **PCF Request No. 3**

Provide the code that correlates the CAISO Scheduling Coordinator (SC) ID (<http://www.caiso.com/PublishedDocuments/ListofSchedulingCoordinatorsCRRHoldersandConvergenceBiddingEntities.pdf>) with identifiers for the SCs used in the Day Ahead, Real Time and Convergence bids. The identities of Day Ahead, Real Time, and Convergence bidders appear to be hidden behind the use of terms such as "PSEUDO\_SC\_ID" and "SCHEDULINGCOORDINATOR\_SEQ". PCF requests that CAISO provide a table the key code that enables matching the SC IDs to specific Day Ahead, Real Time and Convergence transactions. PCF requests that the requested table contain the following format for column headings with one row for each Resource ID:

- a. Market Participant (Client)



- b. Scheduling Coordinator ID (SCID)
- c. Scheduling Coordinator Name
- d. Resource ID

**CAISO Response to Request No. 3**

*The CAISO objects to the question as not reasonably calculated to lead to the discovery of relevant or admissible evidence in the RA proceeding. The identities of individual Scheduling Coordinator (SC) IDs, clients, names, and their Resource IDs are not considered in the Commission’s RA proceeding and have no relevance to how the Commission sets its RA program rules. During the November 25 and December 3 discussions, PCF was unable to explain why it believes individual SC ID data is relevant to the RA program. In addition, this request is unduly burdensome and time-consuming.*

*Notwithstanding the CAISO’s objections, at its November 25 meeting with PCF, the CAISO explained that the CAISO publicly provides the bidding information requested with unique identifiers for each SCID. As a result, PCF can review the underlying bidding information and can correlate that information over time to unique SCIDs. After the CAISO provided this clarifying information, PCF sent an email to the CAISO on December 3, 2020 continuing its request for a list of SCs, but also identifying the unique identifiers for four individual SCs that “PCF is most interested in.” As the CAISO stated above, the identities of individual SCs are not relevant information in the CPUC RA proceeding, as the CPUC does not review individual SC bidding behavior.*

*Finally, the individual SC bidding information is confidential under the CAISO tariff section 20. The CAISO has reached out to SCs pursuant to CAISO Tariff Section 20.4(b) regarding the possibility of disclosing this confidential information. Pursuant to that tariff requirement, SCs have the opportunity to direct any challenge to or defense against the disclosure and the CAISO will cooperate with such affected SCs to the maximum extent practicable.*

**PCF Request No. 4**

Provide a copy of the database schema for the CAISO relational database used to prepare the table to be provided in response to DR Question 2 above. b) Provide a data dictionary that defines all data included in the CAISO relational database.

**CAISO Response to Request No. 4**

*The CAISO objects to the question as not reasonably calculated to lead to the discovery of relevant or admissible evidence in the RA proceeding. During the November 25 and December 3*

*discussions, the CAISO attempted to obtain further information regarding the intent of this request and its relevance to the RA program. PCF explained its attempts to correlate certain data from the CAISO's OASIS website, which prompted this request. PCF was unable to explain exactly what data it is requesting and how this data relates to the CPUC RA proceeding.*

*Notwithstanding these objections, the CAISO continues to review whether it has data responsive to this request. The CAISO will supplement this data request response in the event such data is available.*