March 13, 2020

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation Compliance Filing to Reconcile Overlapping Commission-Approved Tariff Records

Docket No. ER20-____-000

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this compliance filing to reconcile overlapping tariff records in the Commission's eTariff system, in order to reflect the sum of revisions to the same sections of the CAISO tariff that the Commission has already accepted in different proceedings. The CAISO does not propose any changes to Commission-approved tariff language in this filing.

The CAISO requests that the Commission accept the reconciled tariff records contained in this filing effective as of the latest effective date previously approved by the Commission for each tariff record. The Commission has accepted similar compliance filings to reconcile overlapping Commission-approved tariff records in the past,[1] and should do the same here.

I. Background

The CAISO has identified several instances where CAISO tariff records on file in the Commission's eTariff system, although individually they accurately reflect revisions to tariff sections approved by the Commission in the separate and successive proceedings in which they were filed, do not accurately reflect the cumulative result of the Commission's orders across the proceedings. These situations arose due to the chronological sequence in which the tariff records

[1] *See, e.g.*, *Cal. Indep. Sys. Operator Corp.*, Commission letter order, Docket No. ER16-350-000 (Apr. 8, 2016); *Cal. Indep. Sys. Operator Corp.*, Commission letter order, Docket No. ER16-2701-000 (Nov. 18, 2016).

were filed in the different proceedings and then acted on by the Commission. From the time the CAISO files a tariff amendment to the time the Commission issues an order accepting it as of a specified effective date, several months or more may pass, especially if the Commission conditions its acceptance on the filing of revisions to certain portions of the original proposed amendment in a compliance filing. Given these timeframes, it is sometimes necessary for the CAISO to file tariff amendments in which some of the proposed tariff revisions include changes that affect tariff records that are the subject of already pending tariff amendments that the Commission has not yet addressed. In such circumstances, the CAISO will reconcile the tariff records at a later date after the Commission has issued the relevant orders.

The tariff records that are reconciled in this filing concern sections 30.4.1, 39.7.1, and 40.6.8 of the CAISO tariff, each of which is discussed below.[2]

A. Tariff Section 30.4.1

Tariff section 30.4.1 includes a number of sections that run through section 30.4.1.2. The CAISO needs to reconcile the tariff records containing revisions to some of those sections that the Commission accepted in the following orders issued in separate and successive proceedings:

- *California Independent System Operator Corporation*, 165 FERC ¶ 61,161 (November 26, 2018), in which the Commission accepted, in Docket No. ER18-2520-000, version 14.0.0 of the tariff record for section 30.4.1;

- *California Independent System Operator Corporation*, Commission letter order, Docket No. ER18-1169-005 (March 28, 2019), in which the Commission accepted version 16.0.0 of the tariff record for section 30.4.1;[3] and

- *California Independent System Operator Corporation*, 167 FERC ¶ 61,001 (April 1, 2019), in which the Commission accepted, in Docket No. ER19-951-000, version 17.0.0 of the tariff record for section 30.4.1.

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[2] All references to section numbers in this filing are references to sections of the CAISO tariff unless otherwise specified.

[3] The Commission's eTariff page notes that version 15.0.0 of the tariff record for section 30.4.1 was overtaken by events (OBE), namely, by the Commission's acceptance of version 16.0.0 of the tariff record as described above. As the tariff records for section 30.4.1 illustrate, it is possible for a set of currently effective tariff records to be non-sequential (*e.g.*, to include version 14.0.0 and then skip to version 16.0.0).

Although all of these tariff revisions have been accepted by the Commission and are now in effect, the Commission's eTariff page reflects only version 14.0.0 of the tariff record for section 30.4.1 as the currently effective tariff record for that section.[4] Because no filed tariff record includes the accepted revisions from all of the proceedings listed above, the eTariff page cannot display a tariff record that includes all of the currently effective language for section 30.4.1. A similar situation exists on the eTariff page for tariff sections 39.7.1 and 40.6.8 discussed below.

B. Tariff Section 39.7.1

Tariff section 39.7.1 includes a number of sections that run through section 39.7.1.7.3. The CAISO needs to reconcile the tariff records containing revisions to some of those sections that the Commission accepted in the following orders issued in separate and successive proceedings:

- *California Independent System Operator Corporation*, 165 FERC ¶ 61,161 (November 26, 2018), in which the Commission accepted, in Docket No. ER18-2520-000, version 25.0.0 of the tariff record for section 39.7.1;

- *California Independent System Operator Corporation*, Commission letter order, Docket No. ER19-508-000 (January 24, 2019), in which the Commission accepted version 26.0.0 of the tariff record for section 39.7.1;

- *California Independent System Operator Corporation*, 167 FERC ¶ 61,001 (April 1, 2019), in which the Commission accepted, in Docket No. ER19-951-000, version 29.0.0 of the tariff record for section 39.7.1;

- *California Independent System Operator Corporation*, 168 FERC ¶ 61,213 (September 30, 2019), in which the Commission accepted, in Docket No. ER19-2347-000, version 31.0.0 of the tariff record for section 39.7.1; and

[4] When a tariff record has been revised multiple times, the eTariff page shows the accepted version of the record with the latest effective date as the currently effective version. Further, when there is more than one accepted version of a tariff record with the same effective date, the eTariff page shows the one with the highest Effective Priority Order (EPO) value among those with that effective date as the currently effective record. Because version 14.0.0 of the tariff record for section 30.4.1 has a later effective date (December 31, 2019) than versions 16.0.0 and 17.0.0 (each of which has an effective date of April 1, 2019), those two versions are shown as superseded.

- *California Independent System Operator Corporation*, 168 FERC ¶ 61,199 (September 27, 2019), in which the Commission accepted, in Docket No. ER19-1641-001, version 32.0.0 of the tariff record for section 39.7.1.[5]

C. Tariff Section 40.6.8

Tariff section 40.6.8 includes a number of sections that run through section 40.6.8.1.5. The CAISO needs to reconcile the tariff records containing revisions to some of those sections that the Commission accepted in the following orders issued in separate and successive proceedings:

- *California Independent System Operator Corporation*, 165 FERC ¶ 61,161 (November 26, 2018), in which the Commission accepted, in Docket No. ER18-2520-000, version 19.0.0 of the tariff record for section 40.6.8;

- *California Independent System Operator Corporation*, Commission letter order, Docket No. ER19-1542-000 (April 30, 2019), in which the Commission accepted version 22.0.0 of the tariff record for section 40.6.8; and

- *California Independent System Operator Corporation*, Commission letter order, Docket No. ER20-94-000 (December 6, 2019), in which the Commission accepted version 25.0.0 of the tariff record for section 40.6.8.[6]

II. Compliance Filing

The purpose of this compliance filing is to rectify the situations described above by providing conformed tariff records that reflect the cumulative result of all the Commission-approved tariff records for sections 30.4.1, 39.7.1, and 40.6.8 of the CAISO tariff. This filing ensures that the eTariff system reflects all approved tariff amendments, and that the records on the system are consistent

[5] The eTariff page shows version 34.0.0 of the tariff record for section 39.7.1, which the CAISO proposed in Docket No. ER19-2727-000, as being the currently effective tariff record. However, the CAISO believes this is an error, because the Commission rejected without prejudice the revisions the CAISO proposed in that docket to tariff section 39.7.1.1.1.2, which is included in the tariff record for section 39.7.1. *See Cal. Indep. Sys. Operator Corp.*, 170 FERC ¶ 61,015, at PP 24, 39, 42 (2020). The CAISO plans to submit a tariff amendment in the future to re-propose the revisions to tariff section 39.7.1.1.1.2.

[6] The eTariff page shows version 27.0.0 of the tariff record for section 40.6.8, which the CAISO proposed in Docket No. ER20-94-000, as being the currently effective tariff record. However, the CAISO believes this is an error, because, in the letter order issued in that docket and cited immediately above, the Commission accepted version 25.0.0 of the tariff record as indicated above. The CAISO plans to submit a tariff amendment in the future that will include the proposed the revisions to section 40.6.8 reflected in version 27.0.0 of its tariff record.

with the conformed tariff posted on the CAISO website. The filing also satisfies the specific requirements of the Commission orders in the proceedings that accepted the provisions included in the conformed tariff record. The CAISO does not propose any changes to the Commission-approved tariff language in this filing.

Attachment A to this filing contains the marked redline tariff sections showing the revisions made to the effective tariff records currently on file in order to fully reflect all Commission-approved language therein. Attachment B to this filing contains the clean tariff sections showing the full text of the reconciled tariff records once all the conforming changes made by this filing are incorporated.

The CAISO requests that the Commission accept the reconciled tariff records contained in this filing effective as of the latest effective date previously approved by the Commission for each tariff record.

III. Communications

The CAISO requests that all correspondence, pleadings, and other communications regarding this filing be served upon:

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IV. Service

The CAISO has served copies of this filing on the California Public Utilities Commission, the California Energy Commission, and all parties with Scheduling Coordinator Agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

V. Conclusion

For the reasons explained above, the CAISO requests that the Commission accept the reconciled tariff records contained in this compliance filing.

Respectfully submitted,

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Attachment A – Marked Tariff

Compliance Filing to Reconcile Overlapping Commission-Approved Tariff Records

California Independent System Operator Corporation

March 13, 2020

30.4.1 Start-Up and Minimum Load Costs

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30.4.1.1.6 Use-Limited Resources

30.4.1.1.6.1 Registration and Validation Process

A Scheduling Coordinator seeking to obtain Use-Limited Resource status for resource(s) will follow the registration and validation process set forth in this CAISO Tariff and the Business Practice Manual. The registration and validation process requires each Scheduling Coordinator to demonstrate on an annual basis that the resource~~s~~ has one or more limits that meet the Use-Limited Resource criteria as set forth in Section 30.4.1.1.6.1.1 and the Business Practice Manual, and allows each Scheduling Coordinator to seek to recover Opportunity Costs for Use-Limited Resources by making the demonstration set forth in Section 30.4.1.1.6.1.2.

30.4.1.1.6.1.1 Use-Limited Resource Criteria

In order for a resource to be considered a Use-Limited Resource, a Scheduling Coordinator must provide sufficient documentation demonstrating that the resource has one or more limit that meet~~s~~ all three of the following criteria:

(1) The resource has one or more limitations affecting its number of starts, its number of run-hours, or its Energy output due to (a) design considerations, (b) environmental restrictions, or (c) qualifying contractual limitations;

(2) The CAISO Market Process used to dispatch the resource cannot recognize the resource's limitation(s); and

(3) The resource's ability to select hours of operation is not dependent on an energy source outside of the resource's control being available during such hours but the resource's usage needs to be rationed.

Design considerations that satisfy the requirements of this Section are those resulting from physical equipment limitations. A non-exhaustive list of such physical equipment limitations includes restrictions documented in original equipment manufacturer recommendations or bulletins, or limiting equipment such

as storage capability for hydroelectric generating resources. Other design considerations that satisfy the requirements of this Section are those resulting from performance criteria for Demand Response Resources established pursuant to programs or contracts approved by Local Regulatory Authorities. Environmental restrictions that satisfy the requirements of this Section are those imposed by regulatory bodies, legislation, or courts. A non-exhaustive list of such environmental restrictions includes limits on emissions, water use restrictions, run-hour limitations in operating permits or other environmental limits that directly or indirectly limit starts, run hours, or MWh limits, but excludes restrictions with soft caps that allow the resource to increase production above the soft caps through the purchase of additional compliance instruments. Qualifying contractual limitations that satisfy the requirements of this Section are those contained in long-term contracts that: (i) were reviewed and approved by a Local Regulatory Authority on or before January 1, 2015, or were pending approval by a Local Regulatory Authority on or before January 1, 2015 and were later approved; and (ii) were evaluated by the Local Regulatory Authority for the overall cost-benefit of those contracts taking into consideration the overall benefits and burdens, including the limitations on such resources' numbers of starts, numbers of run-hours, or Energy output. Contracts limits that provide for higher payments when start-up, run-hour, or Energy output thresholds are exceeded are not qualifying contractual limitations. Effective April 1, 2022~~November 1, 2021~~, no contractual limitations will constitute qualifying contractual limitations that satisfy the requirements of this Section.

Pursuant to a process set forth in the Business Practice Manual, the CAISO will review the limits and the supporting documentation provided by the Scheduling Coordinator as well as any translation of indirect limits to determine whether the Scheduling Coordinator has made the required showing under this Section. Any dispute regarding the CAISO's determination will be subject to the generally applicable CAISO ADR Procedures set forth in Section 13, which apply except where a CAISO Tariff provision expressly provides for a different means of resolving disputes.

The following types of resources are not eligible to register as Use-Limited Resources: Reliability Demand Response Resources, Regulatory Must-Take Generation, where 100% of the capacity is regulatory must-take, Combined Heat and Power Resources where 100% of the capacity is dedicated to a host industrial process, and Variable Energy Resources.

30.4.1.1.6.1.2 Establishing Opportunity Cost Adders

A Scheduling Coordinator for a Use-Limited Resource that elects the Proxy Cost methodology may seek to establish Opportunity Cost adders for any limitation(s) that meet all three (3) of the following criteria:

(1) Satisfy the requirements of Section 30.4.1.1.6.1.1;

(2) Apply for period(s) longer than the time horizon considered in the applicable Day-Ahead Market process; and

(3) Can be reflected in a monthly, annual, and/or rolling twelve (12) month period.

The CAISO will review the documentation provided by the Scheduling Coordinator and determine whether the CAISO can calculate an Opportunity Cost pursuant to the methodology set forth in Section 30.4.1.1.6.2 using the Opportunity Cost calculator, or whether the Opportunity Cost for the limitation must instead be established pursuant to the negotiation process set forth in Section 30.4.1.1.6.3. Resources with limits that can be modelled using the Opportunity Cost calculator, are not eligible for a negotiated Opportunity Cost. Any Opportunity Cost formula rate resulting from either through the calculated or negotiated process, will remain in place unless and until the formula rate is modified or terminated by the CAISO. Opportunity Costs determined pursuant to a formula rate will remain in place until updated pursuant to Section 30.4.1.1.6.2.1 or Section 30.4.1.1.6.3 to reflect any changes in input values to the formula rate. Any Opportunity Cost bid adder will not be available until the first day of the month following the effective date of this tariff section.

A Scheduling Coordinator may submit documentation, either to establish a new limitation or to modify an existing limitation, in which case the Scheduling Coordinator can request reconsideration that may result in a new formula rate. In addition, Scheduling Coordinators must demonstrate on an annual basis that the resource has one or more limits that meet the Use-Limited Resource criteria as required pursuant to Section 30.4.1.1.6.1. In accordance with Section 39.7.1.3.2.2, the CAISO will make informational filings with FERC of any new, modified, or terminated Opportunity Cost formula rate developed pursuant to Section 30.4.1.1.6.2 or negotiated pursuant to Section 30.4.1.1.6.3.

~~The following types of Use-Limited Resource capacity are not eligible for an Opportunity Cost adder: the capacity of a Condition 2 RMR Unit, a Reliability Demand Response Resource, Regulatory Must-Take capacity, and any other type of~~ A Use-Limited Resource to the extent it has a limitation that satisfies the

requirements of Section 30.4.1.1.6.1 but applies for a period less than or equal to the time horizon considered in the Day-Ahead Market, is not eligible for an Opportunity Cost for any limitation.

30.4.1.1.6.2 Calculation of Opportunity Cost Adders

30.4.1.1.6.2.1 Calculation Schedule

The CAISO will calculate, and will update the most recent calculations of, Start-Up Opportunity Costs for each validated limitation on a Use-Limited Resource's number of starts, Minimum Load Opportunity Costs for each validated limitation on a Use-Limited Resource's number of run-hours, and Variable Energy Opportunity Costs for each validated limitation on a Use-Limited Resource's Energy output for which the Scheduling Coordinator has made the required showing under Section 30.4.1.1.6.1.2. Such calculations or updated calculations will actually be used to set the adder for each validated limitation that can be reflected in a monthly or a rolling twelve (12) month period and will be advisory for each validated limitation that can be reflected in an annual period. The CAISO plans to perform the calculations and updated calculations once a month. It is possible that circumstances may prevent the CAISO from performing the calculations on a monthly basis, in which case the CAISO will prioritize the workload based on Opportunity Costs most likely to need updating. ~~Similarly, circumstances may suggest there is a basis to update calculations more frequently, in which case the CAISO will also prioritize the workload based on Opportunity Costs most likely to need updating.~~ The CAISO will provide the results of the calculations or updated calculations for a Use-Limited Resource to its Scheduling Coordinator.

In the event that the CAISO is unable to perform such calculations or updated calculations for all Use-Limited Resources, the CAISO will give priority to performing such calculations or updated calculations for those Use-Limited Resources that are currently on pace to reach their maximum allowed numbers of starts, maximum allowed numbers of run-hours, or maximum allowed Energy output more quickly than the most recent calculations of Opportunity Costs indicated. To the extent that the CAISO is unable to perform such calculations or updated calculations for a Use-Limited Resource, the CAISO will utilize the most recently calculated or updated Opportunity Costs that have been set or are advisory for the Use-Limited Resource.

30.4.1.1.6.2.2 Methodology for Opportunity Cost Calculator

For the Opportunity Cost calculator developed by the CAISO, each calculation of Opportunity Costs will

equal the estimated profits foregone if the Use-Limited Resource had one fewer unit of starts, run-hours, or Energy output, whichever is applicable, in the future time period of the validated limitation. With regard to each validated limitation of the Use-Limited Resource, the calculation will take into account a margin set forth in the Business Practice Manual. The calculation will also take into account the effect of any validated limitation on a Use-Limited Resource's number of starts, number of run-hours, or Energy output in the monthly and annual and/or rolling twelve month periods. For MSG Transitions, the Opportunity Cost for each transition will be derivative of the number of Start-Ups required for the MSG Resource to achieve a specific MSG Configuration.

The CAISO will calculate the estimated profits for each validated limitation over the future time period of the limitation based on the following estimated inputs: (a) the forecasted hourly average of fifteen-minute LMPs for Energy at the Use-Limited Resource's PNode or Aggregated PNode multiplied by (b) the optimal hourly dispatch of the Use-Limited Resource, minus (c) the estimated monthly Start-Up Cost of the Use-Limited Resource, minus (d) the estimated monthly Minimum Load Cost of the Use-Limited Resource, minus (e) the estimated monthly variable Energy cost of the Use-Limited Resource multiplied by the difference between (f) the optimal hourly commitment and dispatch of the Use-Limited Resource and (g) the PMin of the Use-Limited Resource, minus (h) the estimated monthly Transition Cost of the Use-Limited Resource.

The CAISO will calculate input (a) listed above by executing the following steps in the order shown below:

(1) For each future hour, calculate an hourly implied heat rate at each applicable PNode or Aggregated PNode for a Use-Limited Resource based on the hourly average of the fifteen-minute Real-Time LMPs (reflecting the gas price index used in the Real-Time Market calculated pursuant to Section 39.7.1.1.1.3) from the same hour of the previous year, the Greenhouse Gas Allowance Price, calculated pursuant to Section 39.7.1.1.1.4, from the same day of the previous year, and the gas price index of the applicable fuel region from the same day of the previous year.

(2) For each future month, calculate a monthly future implied heat rate based on the applicable wholesale future power price of the applicable power ~~T~~trading ~~H~~hub as published by Intercontinental Exchange, the most recent Greenhouse Gas Allowance

Price calculated pursuant to Section 39.7.1.1.1.4, and the natural gas future commodity price of the applicable fuel region. The CAISO determines the natural gas futures commodity price by fuel region averaging available prices from the following vendors: Intercontinental Exchange, Natural Gas Intelligence, and SNL Energy/BTU's Daily Gas Wire.

(3) For each future month, calculate a monthly historical implied heat rate based on the wholesale historic power price of the applicable power ~~T~~trading ~~H~~hub as published by Intercontinental Exchange for the same month of the previous year, the average Greenhouse Gas Allowance Price calculated pursuant to Section 39.7.1.1.1.4 for the same month of the previous year, and the average natural gas commodity price, reflecting the gas price index used in the Real-Time Market calculated pursuant to Section 39.7.1.1.1.3, of the applicable fuel region for the same month of the previous year.

(4) For each future month, calculate a monthly power price conversion factor as the ratio of the future implied heat rate calculated under (2) above and the historical implied heat rate calculated under (3) above.

(5) For each future hour, scale the hourly implied heat rate calculated under (1) above by the power price conversion factor calculated under (4) above.

(6) For each future hour, calculate the LMPs by applying the gas price index of the future month and the most recent ~~g~~Greenhouse ~~g~~Gas Allowance Price~~costs~~ calculated pursuant to Section 39.7.1.1.1.4 to the scaled implied heat rates calculated under (5) above.

For a Use-Limited Resource that has twelve (12) or fewer months of LMP data at its PNode or Aggregated PNode, the CAISO will calculate input (a) listed above using LMP data from a comparable PNode or Aggregated PNode.

Additional detail regarding the calculation of Opportunity Costs is provided in Appendix N to the Business Practice Manual for Market Instruments. Any dispute regarding the calculation of Opportunity Costs will be subject to the CAISO ADR Procedures set forth in Section 13.

* * * *

39.7.1 Calculation of Default Energy Bids

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39.7.1.1.1.4 Calculation of Greenhouse Gas Allowance Price

To calculate the Greenhouse Gas Allowance Price, the CAISO will ~~use different greenhouse gas price indices for the Day-Ahead Market and the Real-Time Market and each greenhouse gas price index will be calculated on a daily basis using at least~~ average two prices from ~~two or more of~~ the following vendors~~publications~~: the Intercontinental Exchange~~, CME Group,~~ and ARGUS. If a greenhouse gas price from a vendor ~~index~~ is unavailable for any reason, the CAISO will use the most recent available greenhouse gas price from that vendor~~index~~. If for any reason the CAISO cannot calculate a Greenhouse Gas Allowance Price, it will use the most recently calculated value. ~~For the Day-Ahead Market, t~~The CAISO will update the ~~g~~Greenhouse ~~g~~Gas Allowance ~~p~~Price ~~index between 19:00 and~~ by approximately 22:00 Pacific Time each day (T). The daily Greenhouse Gas Allowance Price will be used in the next day's Real-Time Market (T+1) and in the Day-Ahead Market for the following Trading Day (T+2). ~~using prices for greenhouse gas allowances published on the day that is two (2) days prior to the applicable Trading Day, unless prices for greenhouse gas allowances are not published on that day, in which case the CAISO will use the most recently published prices for greenhouse gas allowances that are available. For the Real-Time Market, the CAISO will update greenhouse gas price indices between the hours of 19:00 and 22:00 Pacific Time using prices for greenhouse gas allowances published one (1) day prior to the applicable Trading Day, unless prices for greenhouse gas allowances are not published on that day, in which case the CAISO will use the most recently published prices for greenhouse gas allowances that are available.~~ The CAISO will calculate each Greenhouse Gas Allowance Price during a year using prices for greenhouse gas allowances from that same year.

39.7.1.1.2 Variable Operation and Maintenance Cost Under the Variable Cost Option

The default value for the variable operation and maintenance cost portion will vary by fuel source or technology as follows: (1) solar $0.00/MWh; (2) nuclear $1.00/MWh; (3) coal $2.00/MWh; (4) wind $2.00/MWh; (5) hydro $2.50/MWh; (6) natural gas-fired combined cycle and steam units $2.80/MWh; (7)

geothermal $3.00 WMh; (8) landfill gas $4.00/MWh; (9) combustion turbines and reciprocating engines $4.80/MWh; and (10) biomass $5.00/MWh. Resource specific values may be negotiated with the CAISO or the Independent Entity charged with calculating the Default Energy Bid. Default operation and maintenance values as well as any negotiated values will also be used to calculate Minimum Load Costs pursuant to Section 30.4.

39.7.1.1.3 Variable Energy Opportunity Costs Under the Variable Cost Option

The CAISO will determine eligibility for Variable Energy Opportunity Costs for Use-Limited Resources pursuant to Section 30.4.1.1.6.

39.7.1.2 LMP Option

The CAISO will calculate the LMP Option for the Default Energy Bid as a weighted average of the lowest quartile of LMPs at the Generating Unit PNode in periods when the unit was Dispatched during the preceding ninety (90) day period for which LMPs that have passed the price validation and correction process set forth in Section 35 are available. The weighted average will be calculated based on the quantities Dispatched within each segment of the Default Energy Bid curve. Each Bid segment created under the LMP Option for Default Energy Bids will be subject to a feasibility test, as set forth in a Business Practice Manual, to determine whether there are a sufficient number of data points to allow for the calculation of an LMP based Default Energy Bid. The feasibility test is designed to avoid excessive volatility of the Default Energy Bid under the LMP Option that could result when calculated based on a relatively small number of prices.

39.7.1.3 Negotiated Rate Option

39.7.1.3.1 Submission Process

Scheduling Coordinators that elect the Negotiated Rate Option for the Default Energy Bid shall submit a proposed Default Energy Bid along with supporting information and documentation as described in a BPM. Within ten (10) Business Days of receipt, the CAISO or an Independent Entity selected by the CAISO will provide a written response. If the CAISO or Independent Entity accepts the proposed Default Energy Bid, it will generally become effective within eleven (11) Business Days from the date of acceptance by the CAISO and remain in effect until: (1) the Default Energy Bid is modified by FERC; (2) the Default Energy Bid is modified by mutual agreement of the CAISO and the Scheduling Coordinator; or

(3) the Default Energy Bid expires, is terminated or is modified pursuant to any agreed upon term or condition or pertinent FERC order.

If the CAISO or Independent Entity selected by the CAISO does not accept the proposed Default Energy Bid, the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator shall enter a period of good faith negotiations that terminates sixty (60) days following the date of submission of a proposed Default Energy Bid by a Scheduling Coordinator. If at any time during this period, the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator agree upon the Default Energy Bid, it will generally become effective within eleven (11) Business Days of the date of agreement and remain in effect until: (1) the Default Energy Bid is modified by FERC; (2) the Default Energy Bid is modified by mutual agreement of the CAISO and the Scheduling Coordinator; or (3) the Default Energy Bid expires, is terminated or is modified pursuant to any agreed upon term or condition or pertinent FERC order.

If by the end of the sixty (60)-day period the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator fail to agree on the Default Energy Bid to be used under the Negotiated Rate Option, the Scheduling Coordinator has the right to file a proposed Default Energy Bid with FERC pursuant to Section 205 of the Federal Power Act.

During the sixty (60)-day period following the submission of a proposed negotiated Default Energy Bid by a Scheduling Coordinator, and pending FERC's acceptance in cases where the CAISO or Independent Entity selected by the CAISO fail to agree on the Default Energy Bid for use under the Negotiated Rate Option and the Scheduling Coordinator filed a proposed Default Energy Bid with FERC pursuant to Section 205 of the Federal Power Act, the Scheduling Coordinator has the option of electing to use any of the other options available pursuant to Section 39.7. If the Scheduling Coordinator does not elect to use any of the other options available pursuant to Section 39.7, or if sufficient data do not exist to calculate a Default Energy Bid using any of these options, the CAISO may establish a temporary Default Energy Bid as specified in Section 39.7.1.5.

Any negotiated Default Energy Bid for a resource that includes an opportunity cost component as of April 1, 2019, will remain in effect, subject to the CAISO's renegotiation rights pursuant to Section 39.7.1.3.2.1, unless the Scheduling Coordinator pursues an Opportunity Cost pursuant to Section 30.4.1.1.6.1.2. If a

Scheduling Coordinator pursues an Opportunity Cost pursuant to Section 30.4.1.1.6.1.2, the Scheduling Coordinator must either elect the Variable Cost Default Energy Bid or the CAISO will renegotiate the negotiated Default Energy Bid to, at a minimum, utilize the Variable Energy Opportunity Cost as a component of the negotiated Default Energy Bid in place of any previously negotiated Opportunity Cost value.

39.7.1.3.2 Negotiated Values and Informational Filings

39.7.1.3.2.1 Renegotiation of Values

The CAISO may require the renegotiation of any components including adders or interim adders for major maintenance expenses determined pursuant to Sections 30.4.1.1.1, 30.4.1.1.2, and 30.4.1.1.4, any Opportunity Costs negotiated pursuant to Section 30.4.1.1.6.3, any Default Energy Bids negotiated pursuant to this Section 39.7.1.3, any temporary Default Energy Bids established pursuant to Section 39.7.1.5, or any custom operation and maintenance adders negotiated pursuant to Section 39.7.1.1.2, that have become outdated, are possibly erroneous, or for which the Scheduling Coordinator has changed. In the renegotiation process, the CAISO may review and propose modifications to such values, and may require the Scheduling Coordinator to provide updated information to support continuation of such values.

39.7.1.3.2.2 Informational Filings with FERC

The CAISO shall make an informational filing with FERC of any adders or interim adders for major maintenance expenses determined pursuant to Sections 30.4.1.1.1, 30.4.1.1.2, and 30.4.1.1.4, any Opportunity Costs calculated pursuant to Section 30.4.1.1.6.2 or negotiated pursuant to Section 30.4.1.1.6.3, any Default Energy Bids negotiated pursuant to this Section 39.7.1.3, any temporary Default Energy Bids established pursuant to Section 39.7.1.5, or any custom operations and maintenance adders negotiated pursuant to Section 39.7.1.1.2, no later than seven (7) days after the end of the month in which the Default Energy or operations and maintenance values were established.

39.7.1.4 Frequently Mitigated Unit Option

A Frequently Mitigated Unit that is eligible for a Bid Adder may select a fourth Default Energy Bid option, which is equal to the Variable Cost Option plus the Bid Adder as described in Section 39.7.

39.7.1.5 Temporary Default Energy Bid

If the Scheduling Coordinator does not elect to use any of the other options available pursuant to Section 39.7.1, or if sufficient data do not exist to calculate a Default Energy Bid using any of the available options, the CAISO will first seek to obtain from the Scheduling Coordinator any additional data required for calculating the Default Energy Bid options available pursuant to 39.7.1. If the provision of additional data by a Scheduling Coordinator results in additional or modified Default Energy Bid options pursuant to 39.7.1, the Scheduling Coordinator will have another opportunity to elect one of these options as its temporary Default Energy Bid. If the Scheduling Coordinator does not elect to use any of the options available pursuant to Section 39.7.1, or if sufficient data still do not exist to calculate a Default Energy Bid using any of the available options, the CAISO may establish a temporary Default Energy Bid based on one or more of the following: (1) operating cost data, opportunity cost, and other appropriate input from the Market Participant; (2) the CAISO's estimated operating costs of the Electric Facility, taking the best information available to the CAISO; (3) an appropriate average of competitive Bids of one or more similar Electric Facilities; or (4) any of the other options for determining a Default Energy Bid for which data are available.

39.7.1.6 Default Energy Bids for RMR ~~Units~~Resources

~~The available capacity in excess of the Maximum Net Dependable Capacity (MNDC) specified in the RMR Contract up to the maximum generation capacity (PMax) is subject to Local Market Power Mitigation.~~ The Scheduling Coordinator for the RMR ~~Unit~~ Resource must rank order its preferences between the Variable Cost Option~~, the LMP Option,~~ and the Negotiated Rate Option, which shall be the default rank order if no rank order is specified by the Scheduling Coordinator. These preferences will be used to determine the Default Energy Bids for the capacity for each RMR Resource~~between the MNDC and PMax~~. ~~RMR Proxy Bids for RMR Units based on contractually specified costs are used in lieu of Default Energy Bids for the contractual RMR Unit capacity between the minimum generating capacity (PMin) and the MNDC. The CAISO or Independent Entity will concatenate these two calculation methodologies (for calculating RMR Proxy Bids and Default Energy Bids for RMR Units) and will adjust them for monotonicity without lowering any price on either curve to create a single Energy Bid Curve to be used in the MPM processes as described in Sections 31 and 33 for the DAM and RTM, respectively.~~ RMR Units are not eligible to receive the ten percent adder under the Variable Cost Option pursuant to

Section 39.7.1.1 or~~a~~ the Bid Adder pursuant to Section 39.8 ~~for contractual RMR Unit capacity between PMin and MNDC~~.

39.7.1.7 ~~[Not Used]~~Hydro Default Energy Bid

Scheduling Coordinators may request a Hydro Default Energy Bid for a hydroelectric resource with storage capability located in the CAISO Balancing Authority Area or any EIM Entity Balancing Authority Area.

39.7.1.7.1 Computation

For each Trading Day, the CAISO will calculate the Hydro Default Energy Bid as the maximum of the (a) gas floor, (b) short-term component, and (c) long-term/geographic component, which are all calculated as specified below.

39.7.1.7.1.1 Gas Floor

The CAISO will calculate the gas floor as the most recent average heat rate for a typical gas turbine generator obtained from the Energy Information Administration, multiplied by the gas price for the fuel region applicable to the location of the hydroelectric resource, multiplied by 1.1.

39.7.1.7.1.2 Short-Term Component

The CAISO will calculate the short-term component as 1.4 multiplied by the maximum of:

(a) the day-ahead peak price at the applicable electric pricing hub;

(b) the on-peak balance of the month on peak futures price for the current month at the applicable electric pricing hub; and

(c) the on-peak monthly index on peak futures price at the applicable electric pricing hub for one (1) month after the current month.

39.7.1.7.1.3 Long-Term/Geographic Component

A Scheduling Coordinator may request that the long-term/geographic component be calculated based on multiple electric pricing hubs in addition to the default electric pricing hub consistent with Section 39.7.1.7.2.1. The CAISO will calculate the long-term/geographic component as 1.1 multiplied by the maximum of:

(a) the day-ahead on-peak price at the applicable electric pricing hub(s);

(b) the on-peak balance of the month futures prices for the current month at the applicable electric

pricing hub(s); and

(c) the on-peak monthly index futures price at the applicable electric pricing hub(s) for all future months up to the maximum storage horizon after the current month.

39.7.1.7.2 Requirements

As part of its request for a Hydro Default Energy Bid, the Scheduling Coordinator must submit to the CAISO:

(a) Annually, for each month of the upcoming year and for each electric pricing hub requested that is not the default electric pricing hub, the Scheduling Coordinator must (1) demonstrate that it holds firm transmission rights to enable delivery from the hydroelectric resource's default market region to the requested electric pricing hub or to a delivery point that is similarly priced location; or (2) provide documentation that supports a historical practice of acquiring monthly firm transmission rights to the requested electric pricing hub(s) or similarly priced location. Scheduling Coordinators may demonstrate transmission rights to multiple locations and, based on the CAISO's evaluation of such information, the CAISO may include multiple electric pricing hubs, in addition to the default electric pricing hubs, in the long-term/geographic component of the Hydro Default Energy Bid for the affected resources. The Scheduling Coordinator will attest through its submission that it reasonably expects it will be able to use the demonstrated transmission rights to deliver incremental sales from the hydroelectric resource because the rights are not fully committed and that there is an actual opportunity to use these rights. If the CAISO includes multiple electric pricing hubs in the long-term/geographic component, the Hydro Default Energy Bid calculation will use the maximum of the electric price indices published for each electric pricing hub as determined for each Trading Day. On Trading Days for which there are no relevant published electric price indices at an electric pricing hub, the CAISO will use the most recently published index for the applicable electric pricing hub.

(b) For resources that Scheduling Coordinators demonstrate a quantity of firm transmission rights to a requested electric pricing hub or similarly priced location that is less than the hydro resource's capacity, the CAISO will include the requested electric pricing hub up to the quantity demonstrated transmission rights, and apply a proportional weighting of the resource's transmission rights to calculate a weighted average of those bilateral electric pricing hub prices when calculating the value of the long-

term/geographic component of the Hydro Default Energy Bid.

(c) In the absence of supporting transmission rights information when calculating the Hydro Default Energy Bid, the CAISO will revert to the default bilateral electric pricing hub specified in Section 39.7.1.7.3.

(d) If during the term of the annual period the Scheduling Coordinator no longer has the firm annual transmission rights previously demonstrated, or can no longer continue a historical practice of acquiring monthly firm transmission rights, the Scheduling Coordinator must inform the CAISO within five (5) Business Days of no longer holding such firm transmission rights.

(e) The CAISO may audit the Scheduling Coordinator and request additional information in support of the Scheduling Coordinator's assertions.

(f) If the CAISO determines the Scheduling Coordinator has submitted inaccurate information, the CAISO may revert the resource to the default electric pricing hubs as specified in Section 39.7.1.7.3.

39.7.1.7.2.2 Maximum Storage Horizon

The maximum hydroelectric resource storage horizon submitted by the Scheduling Coordinator must:

(a) Reflect the typical storage duration of a hydroelectric resource's reservoir, defined as the length of time between which the reservoir cycles from a maximum elevation to a new maximum elevation during a hydro cycle. The Scheduling Coordinator shall compute the reservoir's cycling time based on multiple years of reservoir elevation data.

(b) Be supported by (1) a written attestation by a representative who has the authority to bind the company stating that the value submitted to the CAISO as the maximum storage horizon is consistent with the requirements specified in Section 39.7.1.7.2 (a); or (2) corroborating information submitted to the CAISO, which may include several years of historic reservoir levels for the specific hydroelectric resource and regulatory filings related to the operations of the hydroelectric resource.

39.7.1.7.3 Default Electric Pricing Hubs

The default electric pricing hubs will be as specified in the Business Practice Manuals, which will also include a process for modifying or adding electric pricing hubs to the list of default electric pricing hubs.

* * * *

40.6.8 Use of Generated Bids

(a) **Day-Ahead Market.** Prior to completion of the Day-Ahead Market, the CAISO will determine if Resource Adequacy Capacity subject to the requirements of Section 40.6.1 and for which the CAISO has not received notification of an Outage has not been reflected in a Bid and will insert a Generated Bid for such capacity into the CAISO Day-Ahead Market.

(b) **Real-Time Market.** Prior to running the Real-Time Market, the CAISO will determine if Resource Adequacy Capacity subject to the requirements of Section 40.6.2 and for which the CAISO has not received notification of an Outage has not been reflected in a Bid and will insert a Generated Bid for such capacity into the Real-Time Market.

(c) **Partial Bids for RA Capacity.** If a Scheduling Coordinator for an RA Resource submits a partial bid for the resource's RA Capacity, the CAISO will insert a Generated Bid only for the remaining RA Capacity. In addition, the CAISO will determine if all dispatchable Resource Adequacy Capacity from Short Start Units, not otherwise selected in the IFM or RUC, is reflected in a Bid into the Real-Time Market and will insert a Generated Bid for any remaining dispatchable Resource Adequacy Capacity for which the CAISO has not received notification of an Outage.

(d) **Calculation of Generated Bids.** A Generated Bid for Energy will be calculated pursuant to Sections 30.7.3.4 and 30.7.3.5. A Generated Bid for Ancillary Services will equal zero dollars ($0/MW-hour).

(e) **Exemptions.** Notwithstanding any of the provisions of Section 40.6.8, for the following resource types providing Resource Adequacy Capacity, the CAISO only ~~will not~~ insert<u>s</u> a~~ny~~ Bid in the Day-Ahead Market or Real-Time Market ~~required under this Section 40 for Resource Adequacy Capacity of a~~ where the generally applicable bidding rules in Section 30 call for bid insertion: Use-Limited Resource, Non-Generator Resource, Variable Energy Resource, Hydroelectric Generating Unit, Proxy Demand Resource, Reliability Demand Response Resource, Participating Load, including Pumping Load, Combined Heat and Power Resource, Conditionally Available Resource, Non-Dispatchable Resource, and ~~or~~ resource<u>s</u> providing Regulatory Must-Take Generation ~~unless the resource submits an Energy Bid and fails to submit an Ancillary Service~~

~~Bid or unless the generally applicable bidding rules in Section 30 apply~~.

(f) **NRS-RA Resources.** The CAISO will submit a Generated Bid in the Day-Ahead Market ~~or Real-Time Market~~ for a non-Resource Specific System Resource in each RAAIM assessment hour, to the extent that the resource provides Resource Adequacy Capacity subject to the requirements of Section~~s~~ 40.6.1 ~~or 40.6.2~~ and does not submit an outage request or Bid for the entire amount of that Resource Adequacy Capacity. Aside from where the generally applicable bidding rules in Section 30 call for Bid insertion, the CAISO will not submit a Generated Bid in the Real-Time Market for a Non-Resource-Specific System Resource that fails to meet its bidding obligations under Section 40.6.2. A Bid inserted for the Real-Time Market pursuant to the generally applicable bidding rules in Section 30 may not necessarily cover the full Real-Time Market obligation under Section 40.6.2 and the resource may thus remain exposed to Non-Availability Charges.

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Attachment B – Clean Tariff

Compliance Filing to Reconcile Overlapping Commission-Approved Tariff Records

California Independent System Operator Corporation

March 13, 2020

30.4.1 Start-Up and Minimum Load Costs

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30.4.1.1.6 Use-Limited Resources

30.4.1.1.6.1 Registration and Validation Process

A Scheduling Coordinator seeking to obtain Use-Limited Resource status for resource(s) will follow the registration and validation process set forth in this CAISO Tariff and the Business Practice Manual. The registration and validation process requires each Scheduling Coordinator to demonstrate on an annual basis that the resource has one or more limits that meet the Use-Limited Resource criteria as set forth in Section 30.4.1.1.6.1.1 and the Business Practice Manual, and allows each Scheduling Coordinator to seek to recover Opportunity Costs for Use-Limited Resources by making the demonstration set forth in Section 30.4.1.1.6.1.2.

30.4.1.1.6.1.1 Use-Limited Resource Criteria

In order for a resource to be considered a Use-Limited Resource, a Scheduling Coordinator must provide sufficient documentation demonstrating that the resource has one or more limit that meet all three of the following criteria:

(1) The resource has one or more limitations affecting its number of starts, its number of run-hours, or its Energy output due to (a) design considerations, (b) environmental restrictions, or (c) qualifying contractual limitations;

(2) The CAISO Market Process used to dispatch the resource cannot recognize the resource's limitation(s); and

(3) The resource's ability to select hours of operation is not dependent on an energy source outside of the resource's control being available during such hours but the resource's usage needs to be rationed.

Design considerations that satisfy the requirements of this Section are those resulting from physical equipment limitations. A non-exhaustive list of such physical equipment limitations includes restrictions documented in original equipment manufacturer recommendations or bulletins, or limiting equipment such

as storage capability for hydroelectric generating resources. Other design considerations that satisfy the requirements of this Section are those resulting from performance criteria for Demand Response Resources established pursuant to programs or contracts approved by Local Regulatory Authorities. Environmental restrictions that satisfy the requirements of this Section are those imposed by regulatory bodies, legislation, or courts. A non-exhaustive list of such environmental restrictions includes limits on emissions, water use restrictions, run-hour limitations in operating permits or other environmental limits that directly or indirectly limit starts, run hours, or MWh limits, but excludes restrictions with soft caps that allow the resource to increase production above the soft caps through the purchase of additional compliance instruments. Qualifying contractual limitations that satisfy the requirements of this Section are those contained in long-term contracts that: (i) were reviewed and approved by a Local Regulatory Authority on or before January 1, 2015, or were pending approval by a Local Regulatory Authority on or before January 1, 2015 and were later approved; and (ii) were evaluated by the Local Regulatory Authority for the overall cost-benefit of those contracts taking into consideration the overall benefits and burdens, including the limitations on such resources' numbers of starts, numbers of run-hours, or Energy output. Contracts limits that provide for higher payments when start-up, run-hour, or Energy output thresholds are exceeded are not qualifying contractual limitations. Effective April 1, 2022, no contractual limitations will constitute qualifying contractual limitations that satisfy the requirements of this Section. Pursuant to a process set forth in the Business Practice Manual, the CAISO will review the limits and the supporting documentation provided by the Scheduling Coordinator as well as any translation of indirect limits to determine whether the Scheduling Coordinator has made the required showing under this Section. Any dispute regarding the CAISO's determination will be subject to the generally applicable CAISO ADR Procedures set forth in Section 13, which apply except where a CAISO Tariff provision expressly provides for a different means of resolving disputes.

The following types of resources are not eligible to register as Use-Limited Resources: Reliability Demand Response Resources, Regulatory Must-Take Generation, where 100% of the capacity is regulatory must-take, Combined Heat and Power Resources where 100% of the capacity is dedicated to a host industrial process, and Variable Energy Resources.

30.4.1.1.6.1.2 Establishing Opportunity Cost Adders

A Scheduling Coordinator for a Use-Limited Resource that elects the Proxy Cost methodology may seek to establish Opportunity Cost adders for any limitation(s) that meet all three (3) of the following criteria:

(1) Satisfy the requirements of Section 30.4.1.1.6.1.1;

(2) Apply for period(s) longer than the time horizon considered in the applicable Day-Ahead Market process; and

(3) Can be reflected in a monthly, annual, and/or rolling twelve (12) month period.

The CAISO will review the documentation provided by the Scheduling Coordinator and determine whether the CAISO can calculate an Opportunity Cost pursuant to the methodology set forth in Section 30.4.1.1.6.2 using the Opportunity Cost calculator, or whether the Opportunity Cost for the limitation must instead be established pursuant to the negotiation process set forth in Section 30.4.1.1.6.3. Resources with limits that can be modelled using the Opportunity Cost calculator, are not eligible for a negotiated Opportunity Cost. Any Opportunity Cost formula rate resulting from either through the calculated or negotiated process, will remain in place unless and until the formula rate is modified or terminated by the CAISO. Opportunity Costs determined pursuant to a formula rate will remain in place until updated pursuant to Section 30.4.1.1.6.2.1 or Section 30.4.1.1.6.3 to reflect any changes in input values to the formula rate. Any Opportunity Cost bid adder will not be available until the first day of the month following the effective date of this tariff section.

A Scheduling Coordinator may submit documentation, either to establish a new limitation or to modify an existing limitation, in which case the Scheduling Coordinator can request reconsideration that may result in a new formula rate. In addition, Scheduling Coordinators must demonstrate on an annual basis that the resource has one or more limits that meet the Use-Limited Resource criteria as required pursuant to Section 30.4.1.1.6.1. In accordance with Section 39.7.1.3.2.2, the CAISO will make informational filings with FERC of any new, modified, or terminated Opportunity Cost formula rate developed pursuant to Section 30.4.1.1.6.2 or negotiated pursuant to Section 30.4.1.1.6.3.

A Use-Limited Resource to the extent it has a limitation that satisfies the requirements of Section 30.4.1.1.6.1 but applies for a period less than or equal to the time horizon considered in the Day-Ahead Market, is not eligible for an Opportunity Cost for any limitation.

30.4.1.1.6.2 Calculation of Opportunity Cost Adders

30.4.1.1.6.2.1 Calculation Schedule

The CAISO will calculate, and will update the most recent calculations of, Start-Up Opportunity Costs for each validated limitation on a Use-Limited Resource's number of starts, Minimum Load Opportunity Costs for each validated limitation on a Use-Limited Resource's number of run-hours, and Variable Energy Opportunity Costs for each validated limitation on a Use-Limited Resource's Energy output for which the Scheduling Coordinator has made the required showing under Section 30.4.1.1.6.1.2. Such calculations or updated calculations will actually be used to set the adder for each validated limitation that can be reflected in a monthly or a rolling twelve (12) month period and will be advisory for each validated limitation that can be reflected in an annual period. The CAISO plans to perform the calculations and updated calculations once a month. It is possible that circumstances may prevent the CAISO from performing the calculations on a monthly basis, in which case the CAISO will prioritize the workload based on Opportunity Costs most likely to need updating. The CAISO will provide the results of the calculations or updated calculations for a Use-Limited Resource to its Scheduling Coordinator.

In the event that the CAISO is unable to perform such calculations or updated calculations for all Use-Limited Resources, the CAISO will give priority to performing such calculations or updated calculations for those Use-Limited Resources that are currently on pace to reach their maximum allowed numbers of starts, maximum allowed numbers of run-hours, or maximum allowed Energy output more quickly than the most recent calculations of Opportunity Costs indicated. To the extent that the CAISO is unable to perform such calculations or updated calculations for a Use-Limited Resource, the CAISO will utilize the most recently calculated or updated Opportunity Costs that have been set or are advisory for the Use-Limited Resource.

30.4.1.1.6.2.2 Methodology for Opportunity Cost Calculator

For the Opportunity Cost calculator developed by the CAISO, each calculation of Opportunity Costs will equal the estimated profits foregone if the Use-Limited Resource had one fewer unit of starts, run-hours, or Energy output, whichever is applicable, in the future time period of the validated limitation. With regard to each validated limitation of the Use-Limited Resource, the calculation will take into account a margin set forth in the Business Practice Manual. The calculation will also take into account the effect of

any validated limitation on a Use-Limited Resource's number of starts, number of run-hours, or Energy output in the monthly and annual and/or rolling twelve month periods. For MSG Transitions, the Opportunity Cost for each transition will be derivative of the number of Start-Ups required for the MSG Resource to achieve a specific MSG Configuration.

The CAISO will calculate the estimated profits for each validated limitation over the future time period of the limitation based on the following estimated inputs: (a) the forecasted hourly average of fifteen-minute LMPs for Energy at the Use-Limited Resource's PNode or Aggregated PNode multiplied by (b) the optimal hourly dispatch of the Use-Limited Resource, minus (c) the estimated monthly Start-Up Cost of the Use-Limited Resource, minus (d) the estimated monthly Minimum Load Cost of the Use-Limited Resource, minus (e) the estimated monthly variable Energy cost of the Use-Limited Resource multiplied by the difference between (f) the optimal hourly commitment and dispatch of the Use-Limited Resource and (g) the PMin of the Use-Limited Resource, minus (h) the estimated monthly Transition Cost of the Use-Limited Resource.

The CAISO will calculate input (a) listed above by executing the following steps in the order shown below:

(1) For each future hour, calculate an hourly implied heat rate at each applicable PNode or Aggregated PNode for a Use-Limited Resource based on the hourly average of the fifteen-minute Real-Time LMPs (reflecting the gas price index used in the Real-Time Market calculated pursuant to Section 39.7.1.1.1.3) from the same hour of the previous year, the Greenhouse Gas Allowance Price, calculated pursuant to Section 39.7.1.1.1.4, from the same day of the previous year, and the gas price index of the applicable fuel region from the same day of the previous year.

(2) For each future month, calculate a monthly future implied heat rate based on the applicable wholesale future power price of the applicable power trading hub as published by Intercontinental Exchange, the most recent Greenhouse Gas Allowance Price calculated pursuant to Section 39.7.1.1.1.4, and the natural gas future commodity price of the applicable fuel region. The CAISO determines the natural gas futures commodity price by fuel region averaging available prices from the following vendors: Intercontinental Exchange, Natural Gas Intelligence, and SNL Energy/BTU's Daily Gas

Wire.

(3) For each future month, calculate a monthly historical implied heat rate based on the wholesale historic power price of the applicable power trading hub as published by Intercontinental Exchange for the same month of the previous year, the average Greenhouse Gas Allowance Price calculated pursuant to Section 39.7.1.1.1.4 for the same month of the previous year, and the average natural gas commodity price, reflecting the gas price index used in the Real-Time Market calculated pursuant to Section 39.7.1.1.1.3, of the applicable fuel region for the same month of the previous year.

(4) For each future month, calculate a monthly power price conversion factor as the ratio of the future implied heat rate calculated under (2) above and the historical implied heat rate calculated under (3) above.

(5) For each future hour, scale the hourly implied heat rate calculated under (1) above by the power price conversion factor calculated under (4) above.

(6) For each future hour, calculate the LMPs by applying the gas price index of the future month and the most recent Greenhouse Gas Allowance Price calculated pursuant to Section 39.7.1.1.1.4 to the scaled implied heat rates calculated under (5) above.

For a Use-Limited Resource that has twelve (12) or fewer months of LMP data at its PNode or Aggregated PNode, the CAISO will calculate input (a) listed above using LMP data from a comparable PNode or Aggregated PNode.

Additional detail regarding the calculation of Opportunity Costs is provided in Appendix N to the Business Practice Manual for Market Instruments. Any dispute regarding the calculation of Opportunity Costs will be subject to the CAISO ADR Procedures set forth in Section 13.

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39.7.1 Calculation of Default Energy Bids

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39.7.1.1.1.4 Calculation of Greenhouse Gas Allowance Price

To calculate the Greenhouse Gas Allowance Price, the CAISO will average two prices from the following vendors: the Intercontinental Exchange and ARGUS. If a greenhouse gas price from a vendor is unavailable for any reason, the CAISO will use the most recent available greenhouse gas price from that vendor. If for any reason the CAISO cannot calculate a Greenhouse Gas Allowance Price, it will use the most recently calculated value. The CAISO will update the Greenhouse Gas Allowance Price by approximately 22:00 Pacific Time each day (T). The daily Greenhouse Gas Allowance Price will be used in the next day's Real-Time Market (T+1) and in the Day-Ahead Market for the following Trading Day (T+2). The CAISO will calculate each Greenhouse Gas Allowance Price during a year using prices for greenhouse gas allowances from that same year.

39.7.1.1.2 Variable Operation and Maintenance Cost Under the Variable Cost Option

The default value for the variable operation and maintenance cost portion will vary by fuel source or technology as follows: (1) solar $0.00/MWh; (2) nuclear $1.00/MWh; (3) coal $2.00/MWh; (4) wind $2.00/MWh; (5) hydro $2.50/MWh; (6) natural gas-fired combined cycle and steam units $2.80/MWh; (7) geothermal $3.00 WMh; (8) landfill gas $4.00/MWh; (9) combustion turbines and reciprocating engines $4.80/MWh; and (10) biomass $5.00/MWh. Resource specific values may be negotiated with the CAISO or the Independent Entity charged with calculating the Default Energy Bid. Default operation and maintenance values as well as any negotiated values will also be used to calculate Minimum Load Costs pursuant to Section 30.4.

39.7.1.1.3 Variable Energy Opportunity Costs Under the Variable Cost Option

The CAISO will determine eligibility for Variable Energy Opportunity Costs for Use-Limited Resources pursuant to Section 30.4.1.1.6.

39.7.1.2 LMP Option

The CAISO will calculate the LMP Option for the Default Energy Bid as a weighted average of the lowest quartile of LMPs at the Generating Unit PNode in periods when the unit was Dispatched during the preceding ninety (90) day period for which LMPs that have passed the price validation and correction process set forth in Section 35 are available. The weighted average will be calculated based on the quantities Dispatched within each segment of the Default Energy Bid curve. Each Bid segment created

under the LMP Option for Default Energy Bids will be subject to a feasibility test, as set forth in a Business Practice Manual, to determine whether there are a sufficient number of data points to allow for the calculation of an LMP based Default Energy Bid. The feasibility test is designed to avoid excessive volatility of the Default Energy Bid under the LMP Option that could result when calculated based on a relatively small number of prices.

39.7.1.3 Negotiated Rate Option

39.7.1.3.1 Submission Process

Scheduling Coordinators that elect the Negotiated Rate Option for the Default Energy Bid shall submit a proposed Default Energy Bid along with supporting information and documentation as described in a BPM. Within ten (10) Business Days of receipt, the CAISO or an Independent Entity selected by the CAISO will provide a written response. If the CAISO or Independent Entity accepts the proposed Default Energy Bid, it will generally become effective within eleven (11) Business Days from the date of acceptance by the CAISO and remain in effect until: (1) the Default Energy Bid is modified by FERC; (2) the Default Energy Bid is modified by mutual agreement of the CAISO and the Scheduling Coordinator; or (3) the Default Energy Bid expires, is terminated or is modified pursuant to any agreed upon term or condition or pertinent FERC order.

If the CAISO or Independent Entity selected by the CAISO does not accept the proposed Default Energy Bid, the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator shall enter a period of good faith negotiations that terminates sixty (60) days following the date of submission of a proposed Default Energy Bid by a Scheduling Coordinator. If at any time during this period, the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator agree upon the Default Energy Bid, it will generally become effective within eleven (11) Business Days of the date of agreement and remain in effect until: (1) the Default Energy Bid is modified by FERC; (2) the Default Energy Bid is modified by mutual agreement of the CAISO and the Scheduling Coordinator; or (3) the Default Energy Bid expires, is terminated or is modified pursuant to any agreed upon term or condition or pertinent FERC order.

If by the end of the sixty (60)-day period the CAISO or Independent Entity selected by the CAISO and the Scheduling Coordinator fail to agree on the Default Energy Bid to be used under the Negotiated Rate

Option, the Scheduling Coordinator has the right to file a proposed Default Energy Bid with FERC pursuant to Section 205 of the Federal Power Act.

During the sixty (60)-day period following the submission of a proposed negotiated Default Energy Bid by a Scheduling Coordinator, and pending FERC's acceptance in cases where the CAISO or Independent Entity selected by the CAISO fail to agree on the Default Energy Bid for use under the Negotiated Rate Option and the Scheduling Coordinator filed a proposed Default Energy Bid with FERC pursuant to Section 205 of the Federal Power Act, the Scheduling Coordinator has the option of electing to use any of the other options available pursuant to Section 39.7. If the Scheduling Coordinator does not elect to use any of the other options available pursuant to Section 39.7, or if sufficient data do not exist to calculate a Default Energy Bid using any of these options, the CAISO may establish a temporary Default Energy Bid as specified in Section 39.7.1.5.

Any negotiated Default Energy Bid for a resource that includes an opportunity cost component as of April 1, 2019, will remain in effect, subject to the CAISO's renegotiation rights pursuant to Section 39.7.1.3.2.1, unless the Scheduling Coordinator pursues an Opportunity Cost pursuant to Section 30.4.1.1.6.1.2. If a Scheduling Coordinator pursues an Opportunity Cost pursuant to Section 30.4.1.1.6.1.2, the Scheduling Coordinator must either elect the Variable Cost Default Energy Bid or the CAISO will renegotiate the negotiated Default Energy Bid to, at a minimum, utilize the Variable Energy Opportunity Cost as a component of the negotiated Default Energy Bid in place of any previously negotiated Opportunity Cost value.

39.7.1.3.2 Negotiated Values and Informational Filings

39.7.1.3.2.1 Renegotiation of Values

The CAISO may require the renegotiation of any components including adders or interim adders for major maintenance expenses determined pursuant to Sections 30.4.1.1.1, 30.4.1.1.2, and 30.4.1.1.4, any Opportunity Costs negotiated pursuant to Section 30.4.1.1.6.3, any Default Energy Bids negotiated pursuant to this Section 39.7.1.3, any temporary Default Energy Bids established pursuant to Section 39.7.1.5, or any custom operation and maintenance adders negotiated pursuant to Section 39.7.1.1.2, that have become outdated, are possibly erroneous, or for which the Scheduling Coordinator has changed. In the renegotiation process, the CAISO may review and propose modifications to such

values, and may require the Scheduling Coordinator to provide updated information to support continuation of such values.

39.7.1.3.2.2 Informational Filings with FERC

The CAISO shall make an informational filing with FERC of any adders or interim adders for major maintenance expenses determined pursuant to Sections 30.4.1.1.1, 30.4.1.1.2, and 30.4.1.1.4, any Opportunity Costs calculated pursuant to Section 30.4.1.1.6.2 or negotiated pursuant to Section 30.4.1.1.6.3, any Default Energy Bids negotiated pursuant to this Section 39.7.1.3, any temporary Default Energy Bids established pursuant to Section 39.7.1.5, or any custom operations and maintenance adders negotiated pursuant to Section 39.7.1.1.2, no later than seven (7) days after the end of the month in which the Default Energy or operations and maintenance values were established.

39.7.1.4 Frequently Mitigated Unit Option

A Frequently Mitigated Unit that is eligible for a Bid Adder may select a fourth Default Energy Bid option, which is equal to the Variable Cost Option plus the Bid Adder as described in Section 39.7.

39.7.1.5 Temporary Default Energy Bid

If the Scheduling Coordinator does not elect to use any of the other options available pursuant to Section 39.7.1, or if sufficient data do not exist to calculate a Default Energy Bid using any of the available options, the CAISO will first seek to obtain from the Scheduling Coordinator any additional data required for calculating the Default Energy Bid options available pursuant to 39.7.1. If the provision of additional data by a Scheduling Coordinator results in additional or modified Default Energy Bid options pursuant to 39.7.1, the Scheduling Coordinator will have another opportunity to elect one of these options as its temporary Default Energy Bid. If the Scheduling Coordinator does not elect to use any of the options available pursuant to Section 39.7.1, or if sufficient data still do not exist to calculate a Default Energy Bid using any of the available options, the CAISO may establish a temporary Default Energy Bid based on one or more of the following: (1) operating cost data, opportunity cost, and other appropriate input from the Market Participant; (2) the CAISO's estimated operating costs of the Electric Facility, taking the best information available to the CAISO; (3) an appropriate average of competitive Bids of one or more similar Electric Facilities; or (4) any of the other options for determining a Default Energy Bid for which data are available.

39.7.1.6 Default Energy Bids for RMR Resources

The Scheduling Coordinator for the RMR Resource must rank order its preferences between the Variable Cost Option and the Negotiated Rate Option, which shall be the default rank order if no rank order is specified by the Scheduling Coordinator. These preferences will be used to determine the Default Energy Bids for the capacity for each RMR Resource. RMR Units are not eligible to receive the ten percent adder under the Variable Cost Option pursuant to Section 39.7.1.1 or the Bid Adder pursuant to Section 39.8.

39.7.1.7 Hydro Default Energy Bid

Scheduling Coordinators may request a Hydro Default Energy Bid for a hydroelectric resource with storage capability located in the CAISO Balancing Authority Area or any EIM Entity Balancing Authority Area.

39.7.1.7.1 Computation

For each Trading Day, the CAISO will calculate the Hydro Default Energy Bid as the maximum of the (a) gas floor, (b) short-term component, and (c) long-term/geographic component, which are all calculated as specified below.

39.7.1.7.1.1 Gas Floor

The CAISO will calculate the gas floor as the most recent average heat rate for a typical gas turbine generator obtained from the Energy Information Administration, multiplied by the gas price for the fuel region applicable to the location of the hydroelectric resource, multiplied by 1.1.

39.7.1.7.1.2 Short-Term Component

The CAISO will calculate the short-term component as 1.4 multiplied by the maximum of:

(a) the day-ahead peak price at the applicable electric pricing hub;

(b) the on-peak balance of the month on peak futures price for the current month at the applicable electric pricing hub; and

(c) the on-peak monthly index on peak futures price at the applicable electric pricing hub for one (1) month after the current month.

39.7.1.7.1.3 Long-Term/Geographic Component

A Scheduling Coordinator may request that the long-term/geographic component be calculated based on

multiple electric pricing hubs in addition to the default electric pricing hub consistent with Section 39.7.1.7.2.1. The CAISO will calculate the long-term/geographic component as 1.1 multiplied by the maximum of:

(a) the day-ahead on-peak price at the applicable electric pricing hub(s);

(b) the on-peak balance of the month futures prices for the current month at the applicable electric pricing hub(s); and

(c) the on-peak monthly index futures price at the applicable electric pricing hub(s) for all future months up to the maximum storage horizon after the current month.

39.7.1.7.2 Requirements

As part of its request for a Hydro Default Energy Bid, the Scheduling Coordinator must submit to the CAISO:

(a) Annually, for each month of the upcoming year and for each electric pricing hub requested that is not the default electric pricing hub, the Scheduling Coordinator must (1) demonstrate that it holds firm transmission rights to enable delivery from the hydroelectric resource's default market region to the requested electric pricing hub or to a delivery point that is similarly priced location; or (2) provide documentation that supports a historical practice of acquiring monthly firm transmission rights to the requested electric pricing hub(s) or similarly priced location. Scheduling Coordinators may demonstrate transmission rights to multiple locations and, based on the CAISO's evaluation of such information, the CAISO may include multiple electric pricing hubs, in addition to the default electric pricing hubs, in the long-term/geographic component of the Hydro Default Energy Bid for the affected resources. The Scheduling Coordinator will attest through its submission that it reasonably expects it will be able to use the demonstrated transmission rights to deliver incremental sales from the hydroelectric resource because the rights are not fully committed and that there is an actual opportunity to use these rights. If the CAISO includes multiple electric pricing hubs in the long-term/geographic component, the Hydro Default Energy Bid calculation will use the maximum of the electric price indices published for each electric pricing hub as determined for each Trading Day. On Trading Days for which there are no relevant published electric price indices at an electric pricing hub, the CAISO will use the most recently published index for the applicable electric pricing hub.

(b) For resources that Scheduling Coordinators demonstrate a quantity of firm transmission rights to a requested electric pricing hub or similarly priced location that is less than the hydro resource's capacity, the CAISO will include the requested electric pricing hub up to the quantity demonstrated transmission rights, and apply a proportional weighting of the resource's transmission rights to calculate a weighted average of those bilateral electric pricing hub prices when calculating the value of the long-term/geographic component of the Hydro Default Energy Bid.

(c) In the absence of supporting transmission rights information when calculating the Hydro Default Energy Bid, the CAISO will revert to the default bilateral electric pricing hub specified in Section 39.7.1.7.3.

(d) If during the term of the annual period the Scheduling Coordinator no longer has the firm annual transmission rights previously demonstrated, or can no longer continue a historical practice of acquiring monthly firm transmission rights, the Scheduling Coordinator must inform the CAISO within five (5) Business Days of no longer holding such firm transmission rights.

(e) The CAISO may audit the Scheduling Coordinator and request additional information in support of the Scheduling Coordinator's assertions.

(f) If the CAISO determines the Scheduling Coordinator has submitted inaccurate information, the CAISO may revert the resource to the default electric pricing hubs as specified in Section 39.7.1.7.3.

39.7.1.7.2.2 Maximum Storage Horizon

The maximum hydroelectric resource storage horizon submitted by the Scheduling Coordinator must:

(a) Reflect the typical storage duration of a hydroelectric resource's reservoir, defined as the length of time between which the reservoir cycles from a maximum elevation to a new maximum elevation during a hydro cycle. The Scheduling Coordinator shall compute the reservoir's cycling time based on multiple years of reservoir elevation data.

(b) Be supported by (1) a written attestation by a representative who has the authority to bind the company stating that the value submitted to the CAISO as the maximum storage horizon is consistent with the requirements specified in Section 39.7.1.7.2 (a); or (2) corroborating information submitted to the CAISO, which may include several years of historic reservoir levels for the specific hydroelectric resource and regulatory filings related to the operations of the hydroelectric resource.

39.7.1.7.3 Default Electric Pricing Hubs

The default electric pricing hubs will be as specified in the Business Practice Manuals, which will also include a process for modifying or adding electric pricing hubs to the list of default electric pricing hubs.

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40.6.8 Use of Generated Bids

(a) **Day-Ahead Market.** Prior to completion of the Day-Ahead Market, the CAISO will determine if Resource Adequacy Capacity subject to the requirements of Section 40.6.1 and for which the CAISO has not received notification of an Outage has not been reflected in a Bid and will insert a Generated Bid for such capacity into the CAISO Day-Ahead Market.

(b) **Real-Time Market.** Prior to running the Real-Time Market, the CAISO will determine if Resource Adequacy Capacity subject to the requirements of Section 40.6.2 and for which the CAISO has not received notification of an Outage has not been reflected in a Bid and will insert a Generated Bid for such capacity into the Real-Time Market.

(c) **Partial Bids for RA Capacity.** If a Scheduling Coordinator for an RA Resource submits a partial bid for the resource's RA Capacity, the CAISO will insert a Generated Bid only for the remaining RA Capacity. In addition, the CAISO will determine if all dispatchable Resource Adequacy Capacity from Short Start Units, not otherwise selected in the IFM or RUC, is reflected in a Bid into the Real-Time Market and will insert a Generated Bid for any remaining dispatchable Resource Adequacy Capacity for which the CAISO has not received notification of an Outage.

(d) **Calculation of Generated Bids.** A Generated Bid for Energy will be calculated pursuant to Sections 30.7.3.4 and 30.7.3.5. A Generated Bid for Ancillary Services will equal zero dollars ($0/MW-hour).

(e) **Exemptions.** Notwithstanding any of the provisions of Section 40.6.8, for the following resource types providing Resource Adequacy Capacity, the CAISO only inserts a Bid in the Day-Ahead Market or Real-Time Market where the generally applicable bidding rules in Section 30 call for bid insertion: Use-Limited Resource, Non-Generator Resource, Variable Energy Resource,

Hydroelectric Generating Unit, Proxy Demand Resource, Reliability Demand Response Resource, Participating Load, including Pumping Load, Combined Heat and Power Resource, Conditionally Available Resource, Non-Dispatchable Resource, and resources providing Regulatory Must-Take Generation.

(f) **NRS-RA Resources.** The CAISO will submit a Generated Bid in the Day-Ahead Market for a non-Resource Specific System Resource in each RAAIM assessment hour, to the extent that the resource provides Resource Adequacy Capacity subject to the requirements of Section 40.6.1 and does not submit an outage request or Bid for the entire amount of that Resource Adequacy Capacity. Aside from where the generally applicable bidding rules in Section 30 call for Bid insertion, the CAISO will not submit a Generated Bid in the Real-Time Market for a Non-Resource-Specific System Resource that fails to meet its bidding obligations under Section 40.6.2. A Bid inserted for the Real-Time Market pursuant to the generally applicable bidding rules in Section 30 may not necessarily cover the full Real-Time Market obligation under Section 40.6.2 and the resource may thus remain exposed to Non-Availability Charges.

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