Blacklines

Multi-Stage Generating Resource Draft Tariff Language

March 19, 2010

General Dynegy comments (may also be captured within):

To help market participants understand this tariff language, the CAISO should define several key terms: "commit", configuration", "resource level", "status", start-up path", "register",~~,~~"default Resource Adequacy Configuration", "Configuration indicators" "in transition",

In regards to moving between the different operating configurations - perhaps there is a need to distinguish between "commit" and "transition".?~~—~~,

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8.4.1 Operating Characteristics Required to Provide Ancillary Services.

Each Generating Unit, System Unit, Participating Load or System Resource for which a Scheduling Coordinator wishes to submit a Bid to provide Ancillary Services must comply with the requirements for the specific Ancillary Service as set forth in Appendix K and the Business Practice Manual. Scheduling Coordinators for Multi-Stage Generating Resources must comply with the certification requirements in Section 8, Appendix K of the CAISO Tariff, and the Business Practice Manuals for each Multi-Stage Generation Resource Configuration~~at the configuration levels~~ and Scheduling Coordinators can only submit Ancillary Services Bids or Submissions to Self-Provide Ancillary Services into the CAISO Markets for the Multi-Stage Generating Resource configurations for which they are certified. In addition, to the extent the CAISO requires specific operating characteristics for Ancillary Services certification, the responsible Scheduling Coordinator must submit to the CAISO such specific operating characteristics for each Configuration~~at the configuration level~~. The requirements in Appendix K and the Business Practice Manuals include Ancillary Service control, capability and availability standards. The requirements also involve the following operating characteristics:

(a) Ramp Rate increase and decrease (MW/minute);

(b) power factor (leading and lagging) as required by Section 8.2.3.3;

(c) maximum output (real and reactive), except that System Resources shall be required to comply only with the requirement for maximum real power;

(d) minimum output (real and reactive), except that System Resources shall be required to comply only with the requirement for minimum real power;

(e) AGC capability, control scheme, and range; and

(f) minimum length of time the resource can be available to provide the relevant Ancillary Service.

In Appendix K and the Business Practice Manuals the CAISO will differentiate the operating characteristics according to the Ancillary Service being provided.

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8.9 Verification, Compliance Testing, and Audit of Ancillary Services.

Availability of contracted and Self-Provided Ancillary Services and RUC Capacity shall be verified by the CAISO by unannounced testing of Generating Units, Loads and System Resources, by auditing of response to CAISO Dispatch Instructions, and by analysis of the appropriate Meter Data, or Interchange Schedules. The CAISO may test the capability of any Generating Unit, System Unit, System Resource, external import of a System Resource, Participating Load, or reactive device providing Ancillary Services or RUC Capacity. Participating Generators, owners or operators of Participating Loads, operators of System Units or System Resources, owners or operators of reactive devices and Scheduling Coordinators shall notify the CAISO immediately whenever they become aware that an Ancillary Service or RUC Capacity is not available in any way. All Participating Generators, owners or operators of Participating Loads, operators of System Units or System Resources and owners or operators of reactive devices shall check, monitor and/or test their system and related equipment routinely to assure availability of the committed Ancillary Services and RUC Capacity. These requirements apply to Ancillary Services whether the Ancillary Services are contracted or self-provided. For a duration specified by the CAISO, the CAISO may suspend the technical eligibility certificate of a Scheduling Coordinator for a Generating Unit, System Unit, Load or System Resource, which repeatedly fails to perform. The CAISO shall develop measures to discourage repeated non-performance on the part of both bidders and self-providers. Further, all of these requirements apply to each Multi-Stage Generating Resource Configuration~~at the configuration level to Multi-Stage Generating Resources~~.

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8.9.2 Compliance Testing for Regulation~~.~~

The CAISO may test the capability of any Generating Unit or System Resource providing Regulation by using the CAISO EMS to move that Generating Unit's or System Resource's output over the full range of its Regulation capacity within a ten-minute period. For a Multi-Stage Generating Resource the full range of Regulation capacity is evaluated at the applicable C~~c~~onfiguration.

8.9.3 Compliance Testing for Non-Spinning Reserve.

8.9.3.1 Compliance Testing of a Generating Unit, System Unit or System Resource.

The CAISO may test the Non-Spinning Reserve capability of a Generating Unit, System Unit or an external import of a System Resource by issuing unannounced Dispatch Instructions requiring the Generating Unit or System Unit to come on line and ramp up or, in the case of a System Resource, to affirmatively respond to Real-Time interchange schedule adjustment; all in accordance with the Scheduling Coordinator's Bid. Such tests may not necessarily occur on the hour. The CAISO shall measure the response of the Generating Unit, System Unit or external import of a System Resource to determine compliance with its stated capabilities. For a Multi-Stage Generating Resource the full range of Non-Spinning capacity is evaluated at the applicable C~~c~~onfiguration.

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8.9.6 Compliance Testing for RUC Capacity~~.~~

The CAISO may test the capability of a Generating Unit, System Unit or an external import of a System Resource to provide RUC Capacity by issuing unannounced Dispatch Instructions requiring the Generating Unit or System Unit to come on line and ramp up or, in the case of a System Resource, to affirmatively respond to a Real-Time Interchange Schedule adjustment; all in accordance with the Scheduling Coordinator's Bid. Such tests may not necessarily occur on the hour. The CAISO shall measure the response of the Generating Unit, System Unit or external import of a System Resource to determine compliance with its stated capabilities. For a Multi-Stage Generating Resource the ~~full~~ range of RUC Capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

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8.9.9 Performance Audit for Regulation~~.~~

The CAISO will audit the performance of a Generating Unit providing Regulation by monitoring its response to CAISO EMS control or, in the case of an external import of a System Resource providing Regulation, by monitoring the dynamic Interchange response to CAISO EMS control around its Set Point within its rated MW/minute capability over the range of Regulation capacity scheduled for the current Settlement Period. For a Multi-Stage Generating Resource the range of Regulation capacity ~~is~~ evaluated is the range for~~at~~ the applicable configuration.

8.9.10 Performance Audit for Spinning Reserve.

The CAISO will audit the performance of a Generating Unit or external import of a System Resource providing Spinning Reserve by auditing its response to Dispatch Instructions and by analysis of Meter Data associated with the Generating Unit. Such audits may not necessarily occur on the hour. A Generating Unit providing Spinning Reserve shall be evaluated on its ability to respond to a Dispatch Instruction, move at the MW/minute capability stated in its Bid, reach the amount of Spinning Reserve capacity scheduled for the current Settlement Period within ten (10) minutes of issue of the Dispatch Instruction by the CAISO, and respond to system frequency deviations outside the allowed frequency deadband. An external import of a System Resource providing Spinning Reserve shall be evaluated on its ability to respond to a Dispatch Instruction, move at the MW/minute capability stated in its Bid, reach the amount of Spinning Reserve capacity scheduled for the current Settlement Period within ten (10) minutes of issue of the Dispatch Instruction by the CAISO. For a Multi-Stage Generating Resource the range of Spinning Reserve capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

8.9.11 Performance Audit for Non-Spinning Reserve.

The CAISO will audit the performance of a Generating Unit, Load, or System Resource providing Non-Spinning Reserve by auditing its response to Dispatch Instructions, and by analysis of Meter Data associated with the resource. Such audits may not necessarily occur on the hour. A Generating Unit providing Non-Spinning Reserve shall be evaluated on its ability to respond to a Dispatch Instruction, move in accordance with the time delay and MW/minute capability stated in its Bid, and reach the amount of Non-Spinning Reserve capacity under the control of the CAISO scheduled for the current Settlement Period within ten (10) minutes of issue of the Dispatch Instruction by the CAISO. An external import of a System Resource providing Non-Spinning Reserve shall be evaluated on its ability to respond to a Dispatch Instruction, move in accordance with the time delay and MW/minute capability stated in its Bid, and reach the amount of Non-Spinning Reserve capacity scheduled for the current Settlement Period within ten (10) minutes of issue of the Dispatch Instruction by the CAISO. A Load providing Non-Spinning Reserve from Curtailable Demand shall be evaluated on its ability to respond to a Dispatch Instruction, move in accordance with the time delay and MW/minute capability stated in its Bid, and reach the amount

of Non-Spinning Reserve capacity scheduled for the current Settlement Period within ten (10) minutes of issue of the Dispatch Instruction by the CAISO. For a Multi-Stage Generating Resource the range of Non-Spinning Reserve capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

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8.9.14 Performance Audit for RUC Capacity.

The CAISO will audit the performance of a Generating Unit, Participating Load, or System Resource providing RUC Capacity by auditing its response to Dispatch Instructions, and by analysis of Meter Data associated with the resource. Such audits may not necessarily occur on the hour. A Generating Unit providing RUC Capacity shall be evaluated on its ability to respond to a Dispatch Instruction, start within the designated time delay, move at the MW/minute capability stated in its Bid, reach the amount of RUC Capacity scheduled for the Settlement Period concerned and sustain operation at this level for a sufficient time to assure availability over the specified period. An external import of a System Resource providing RUC Capacity shall be evaluated on its ability to respond to a Dispatch Instruction, start within the designated time delay, move at the MW/minute capability stated in its Bid, reach the amount of RUC Capacity scheduled for the Settlement Period concerned and sustain operation at this level for a sufficient time to assure availability over the specified period. For a Multi-Stage Generating Resource, the ~~full~~ range of RUC Capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

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8.10.2 Spinning Reserve~~.~~

The CAISO shall test the Spinning Reserve capability of a Generating Unit, System Unit or System Resource by issuing unannounced Dispatch Instructions requiring the Generating Unit, System Unit or System Resource to ramp up to its ten (10) minute capability. The CAISO shall measure the response of the Generating Unit, System Unit or System Resource to determine compliance with requirements. Such tests may not necessarily occur on the hour. The Scheduling Coordinator for the Generating Unit, System Unit or System Resource shall be paid pursuant to Section 11.5.6. For a Multi-Stage Generating Resource the ~~full~~ range of Spinning Reserve capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

8.10.3 Non-Spinning Reserve.

The CAISO may test the Non-Spinning Reserve capability of a Generating Unit, Load, System Unit or System Resource by issuing unannounced Dispatch Instructions requiring the Generating Unit, Load, System Unit or System Resource to come on line and ramp up or to reduce Demand to its ten (10) minute capability. The CAISO shall measure the response of the Generating Unit, System Unit, System Resource or Load to determine compliance with requirements. The Scheduling Coordinator for the Generating Unit, System Unit, Load or System Resource shall be paid pursuant to Section 11.5.6. For a Multi-Stage Generating Resource the ~~full~~ range of Non-Spinning Reserve capacity ~~is~~ evaluated is the range for~~at~~ the applicable C~~c~~onfiguration.

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8.10.8 Rescission of Payments for Undispatchable, Unavailable, and Undelivered Ancillary Service Capacity.

If Ancillary Services capacity that receives an AS Award or Self-Provided Ancillary Services capacity provided from a Generating Unit, Participating Load, System Unit or System Resource is Undispatchable Capacity, Unavailable Capacity, or Undelivered Capacity during the relevant Settlement Interval, then payments will be rescinded as described in this Section 8.10.8 and settled in accordance with Section 11.10.9. If the CAISO determines that non-compliance of a Participating Load, Generating Unit, System Unit or System Resource, with an operating order or Dispatch Instruction from the CAISO, or with any other applicable technical standard under the CAISO Tariff, causes or exacerbates system conditions for which the WECC imposes a penalty on the CAISO, then the Scheduling Coordinator of such Participating Load, Generating Unit, System Unit or System Resource shall be assigned that portion of the WECC penalty which the CAISO reasonably determines is attributable to such non-compliance, in addition to any other penalties or sanctions applicable under the CAISO Tariff.

8.10.8.1 Rescission of Payments for Undispatchable Ancillary Service Capacity.

The CAISO shall calculate the Real-Time ability of each Generating Unit, Participating Load, System Unit or System Resource to deliver Energy from Ancillary Services capacity or Self-Provided Ancillary

Services capacity for each Settlement Interval based on its maximum operating capability, actual telemetered output, and Operational Ramp Rate as described in Section 30.10. For the Multi-Stage Generating Resource the Configuration-specific maximum operating capability and the Operational Ramp Rate are used~~considered at the applicable configuration level~~. System Resources that are awarded Ancillary Services capacity in the Day-Ahead Market are required to electronically tag (E-Tag as prescribed by the WECC) the Ancillary Services capacity. If the amounts of Ancillary Services capacity in an electronic tag differ from the amounts of Ancillary Services capacity for the System Resource, the Undispatchable Capacity will equal the amount of the difference, and will be settled in accordance with the provisions of Section 11.10.9.1.

8.10.8.2 Rescission of Payments for Unavailable Ancillary Service Capacity.

If the CAISO determines that a Scheduling Coordinator has supplied Uninstructed Imbalance Energy to the CAISO during a Settlement Interval from the capacity of a Generating Unit, Participating Load, System Unit or System Resource that is obligated to supply Spinning Reserve or Non-Spinning Reserve to the CAISO, payments to the Scheduling Coordinator for the Ancillary Service capacity used to supply Uninstructed Imbalance Energy shall be eliminated to the extent of the deficiency, in accordance with the provisions of Section 11.10.9.2. For Multi-Stage Generating Resources the determination of~~for~~ which payments will be rescinded shall consider the ~~at the resource level with the~~ maximum operating capability for~~at~~ the applicable C~~c~~onfiguration ~~level~~.

8.10.8.3 Rescission of Payments for Undelivered Ancillary Service Capacity.

For each Settlement Interval in which a Generating Unit, Participating Load, System Unit or System Resource fails to supply Energy from Spinning Reserve or Non-Spinning Reserve capacity in accordance with a Dispatch Instruction, or supplies only a portion of the Energy specified in the Dispatch Instruction, the capacity payment will be reduced to the extent of the deficiency, in accordance with the provisions of Section 11.10.9.3. For a Multi-Stage Generating Resource this determination is made at the resource level. [What is the "resource level"? And is that last sentence even needed?]

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9.7 Multi-Stage Generating Resource~~s~~ Outages

Participating Generators for~~of~~ Multi-Stage Generating Resources shall comply with~~provide~~ the Outage reporting requirements in Section 9 ~~by resource and~~ for each C~~c~~onfiguration, as applicable. In addition, to the extent that the responsible Scheduling Coordinator modifies the registered Multi-Stage Generating Resource's characteristics as provided in Section 27.8.3, the Participating Generator for the Multi-Stage Generating Resource shall modify any information or reports previously submitted pursuant to this Section 9 to account for any registered status and characteristic changes as soon as possible after receiving notice from the CAISO accepting the registered status or characteristics changes and no later than two (2) days prior to the date on which the Section 27.8.3 changes are expected to be in effect.

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11.8.1 CAISO Determination of Self-Commitment Periods~~.~~

For the purposes of identifying the periods during which a Bid Cost Recovery Eligible Resource is deemed self-committed and thus ineligible for Start-Up Costs, Transition Costs, Minimum Load Costs, IFM Pump Shut-Down Costs and IFM Pumping Costs, the CAISO derives the Self-Commitment Periods as described below. The CAISO will determine the Self-Commitment Periods for Multi-Stage Generating Resources based on the applicable C~~c~~onfiguration. MSS resources designated for Load following are considered to be self-committed if they have been scheduled with non-zero Load following capacity, or are otherwise used to follow Load in the Real-Time. The IFM and RUC Self-Commitment Periods will be available as part of the Day-Ahead Market results provided to the applicable Scheduling Coordinator. The interim RTM Self-Commitment Periods as reflected in the HASP will be available as part of the HASP results for the relevant Trading Hour as provided to the applicable Scheduling Coordinator. The final RTM Self-Commitment Period is determined ex-post for Settlements purposes. ELS Resources committed through the ELC Process described in Section 31.7 are considered to have been committed in the IFM Commitment Period for the applicable Trading Day for the purposes of determining BCR settlement in this section 11.8.

11.8.1.1 IFM Self-Commitment Period~~.~~

An IFM Self-Commitment Period for a Bid Cost Recovery Eligible Resource shall consist of one or more sets of consecutive Trading Hours during which the relevant Bid Cost Recovery Eligible Resource has

either a Self-Schedule or, except for Self-Provided Ancillary Services for Non-Spinning Reserve by a Fast Start Unit, has a non-zero amount of Self-Provided Ancillary Services. An IFM Self-Commitment Period for a Bid Cost Recovery Eligible Resource may not be less than the relevant Minimum Run Time (MRT), rounded up to the next hour. Consequently, if a Bid Cost Recovery Eligible Resource first self-commits in hour h of the Trading Day, the self-commitment will be extended to hour h + MRT. Two IFM Self-Commitment Periods for a Bid Cost Recovery Eligible Resource may not be apart by less than the relevant Minimum Down Time (MDT) (rounded up to the next hour). Consequently, if a Bid Cost Recovery Eligible Resource has submitted a Self-Schedule or Submission to Self-Provide an Ancillary Service in hours h and h + n, and n is less than the MDT, the IFM Self-Commitment Period will be extended to the hours in between h and h + n inclusive. The number of IFM Self-Commitment Periods for a Bid Cost Recovery Eligible Resource within a Trading Day cannot exceed the relevant Maximum Daily Start-Ups (MDS), or MDS + 1 if the first IFM Self-Commitment Period is the continuation of an IFM or RUC Commitment Period from the previous Trading Day. Consequently, if a Bid Cost Recovery Eligible Resource has submitted a Self-Schedule or Submission to Self-Provide an Ancillary Service, such that after applying the preceding two rules, the number of disjoint Self Commitment Periods for the Operating Day exceeds the Maximum Daily Start-Ups (MDS), or MDS + 1 if the first IFM Self-Commitment Period is the continuation of an IFM or RUC Commitment Period from the previous Trading Day, the disjoint Self Commitment Periods with smallest time gap in between will be joined together to bring down the number of disjoint Self Commitment Periods to MDS or MDS +1 as relevant. For Multi-Stage Generating Resources, the Minimum Run Time and Minimum Down Time will be evaluated at both the Cconfiguration and resource level to determine whether an extension of the IFM Self-Commitment Period applies.

[again, what is the "resource level"? How does it differ from the most expansive Configuration level? If the CAISO retains this term, it should be defined.]

11.8.1.2 Real-Time Self-Commitment Period.

A Real-Time Market Self-Commitment Period for a Bid Cost Recovery Eligible Resource shall consist of all consecutive Dispatch Intervals not in an IFM Commitment Period or a RUC Commitment Period where the Bid Cost Recovery Eligible Resource has a Self-Schedule or, except for Self-Provided Ancillary Services for Non-Spinning Reserve by a Fast Start Unit, has a non-zero amount of Self-Provided Ancillary

Services. A Real-Time Market Self-Commitment Period for a Bid Cost Recovery Eligible Resource may not be less than the relevant MUT (rounded up to the next 15-minute Commitment Interval) when considered jointly with any adjacent IFM Self-Commitment Period. For example, if a Bid Cost Recovery Eligible Resource self-commits at time h, the self-commitment will be extended to Commitment Interval h + MUT, unless an IFM or RUC Commitment Period exists starting after hour h, in which case the self-commitment will be extended to Commitment Interval h + min (MUT, t), where t represents the time interval between the Real-Time Market Self-Commitment Period and the IFM or RUC Commitment Period. A Real-Time Market Self-Commitment Period for a Bid Cost Recovery Eligible Resource may not be apart from an IFM or RUC Commitment Period by less than the relevant MDT (rounded up to the next 15-minute Commitment Interval). For example, if a Bid Cost Recovery Eligible Resource self-commits at time T1 and has a RUC Schedule at time T2 < T1, the Real-Time Market Self-Commitment Period will be extended to the interim Commitment Intervals if T1 - T2< MDT. The number of Real-Time Market Self-Commitment Periods for a Bid Cost Recovery Eligible Resource within a Trading Day, when considered jointly with any adjacent IFM Self-Commitment Period, may not exceed the relevant MDS (or MDS + 1 if the first Real-Time Market Self-Commitment Period is the continuation of a Real-Time Market Commitment Period from the previous Trading Day). For example, if a Bid Cost Recovery Eligible Resource self-commits at time T1 and has a RUC Schedule at time T2 > T1, the Real-Time Market Self-Commitment Period will be extended to the interim Commitment Intervals if an additional Real-Time Market Start-Up at T1 would violate the MDS constraint. For Multi-Stage Generating Resources, the Minimum Run Time and Minimum Down Time will be evaluated for the applicable C~~at both the~~ configuration ~~and resource level~~ to determine whether an extension of the RTM Self-Commitment Period applies.

11.8.1.3 Multi-Stage Generating Resource Start-Up, Minimum Load, or Transition Costs

For the settlement of the Multi-Stage Generating Resource Start-Up Cost, Minimum Load Cost, and Transition Cost in the IFM, RUC, and RTM, the CAISO will select the applicable Start-Up Cost, Minimum Load Cost, and Transition Cost based on the following rules.

(1) In any given Settlement Interval, the CAISO will first apply the following rules to determine the applicable Start-Up Cost, Minimum Load Cost, and Transition Cost for the

Multi-Stage Generating Resources:

[Does the CAISO need to define the word "commit"? Does it simply mean "to start-up?" Or does it mean "to start-up and specify a certain operating level and/or Configuration"? Or perhaps just "to direct to operate in a particular configuration"? Perhaps this term should be defined…]

(a) If the CAISO commits the Multi-Stage Generating Resource in the IFM and/or RUC in different Ceonfigurations than it commits the Multi-Stage Generating Resource in the RTM, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the RTM Start-Up Cost, Minimum Load Cost, and Transition Cost from the Real-Time Market committed Ceonfiguration as described in Section 11.8.4.1. [??]

(b) If the CAISO commits the Multi-Stage Generating Resource in the IFM and/or RUC in different Ceonfigurations than the Multi-Stage Generating Resource is self-committed in Real-Time Market, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the the IFM or RUC Start-Up Cost, Minimum Load Cost, and Transition Cost of the Ceonfiguration committed in the IFM or RUC, as described in Sections 11.8.2.1 and 11.8.3.1, and further determined pursuant to part (2) below..

(c) If the CAISO commits the Multi-Stage Generating Resource in the IFM and RUC in the same Ceonfiguration the ISO commits the Multi-Stage Generating Resource in RTM, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the IFM or RUC Start-Up Cost, Minimum Load Cost, and Transition Cost for the Ceonfiguration committed in the IFM or RUC, described in Sections 11.8.2.1 and 11.8.3.1, and further determined pursuant to part (2) below.

(d) If the Multi-Stage Generating Resource is self-committed in IFM or RUC in the same Cconfiguration as the ISO commits the Multi-Stage Generating Resource in RTM, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the RTM Start-Up Cost, Minimum Load Cost, and Transition Cost for the Cconfiguration committed in the Real-Time Market as described in Section 11.8.4.1.

(2) In any given Settlement Interval, after the rules specified in Section 1 have been executed, the ISO will apply the following rules to determine whether the IFM or RUC Start-Up Cost, Minimum Load Cost, and Transition Cost apply for Multi-Stage Generating Resources:

(a) If the CAISO commits the Multi-Stage Generating Resource in the IFM in a different Cconfiguration than it commits the Multi-Stage Generating Resource in RUC, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the RUC Start-Up Cost, Minimum Load Cost, and Transition Cost from the RUC--committed Cconfiguration as described in Section 11.8.3.1.

(b) If the CAISO commits the Multi-Stage Generating Resource in the IFM in a Cconfiguration other than the Multi-Stage Generating Resource is self-committed in RUC, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be settled based on the IFM Costs of the Cconfiguration committed in the IFM, as described in Section 11.8.2.1

(c) If the CAISO commits the Multi-Stage Generating Resource in the IFM in the same Cconfiguration the CAISO commits the Multi-Stage Generating Resource in RUC, then Multi-Stage Generating Resource's Bid Costs will be based on the IFM Start-Up Cost, Minimum Load Cost, and Transition

Cost for the configuration committed in the IFM as described in Section 11.8.2.1.

(d) If the Multi-Stage Generating Resource is self-committed in IFM in the same Cconfiguration as the ISO commits the Multi-Stage Generating Resource in RUC, then the Multi-Stage Generating Resource's Start-Up Cost, Minimum Load Cost, and Transition Cost will be based on the RUC Start-Up Cost, Minimum Load Cost, and Transition Cost for the Cconfiguration committed in the RUC, as described in Section 11.8.3.1.

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11.8.2.1 IFM Bid Cost Calculation.

For each Settlement Interval, the CAISO shall calculate IFM Bid Cost for each Bid Cost Recovery Eligible Resource as the algebraic sum of the IFM Start-Up Cost, IFM Transition Cost, IFM Minimum Load Cost, IFM Pump Shut-Down Cost, IFM Energy Bid Cost, IFM Pumping Cost, and IFM AS Bid Cost. For Multi-Stage Generating Resources, in addition to the specific IFM Bid Cost rules described in Section 11.8.2.1, the CAISO will apply the rules described in Section 11.8.1.3 to further determine the applicable Cconfiguration-based CAISO Market Start-Up Cost, Transition Cost and Minimum Load Cost in a given Settlement Interval.

11.8.2.1.1 IFM Start-Up Cost.

The IFM Start-Up Cost for any IFM Commitment Period shall equal to the Start-Up Costs submitted by the Scheduling Coordinator to the CAISO for the IFM divided by the number of Settlement Intervals within the applicable IFM Commitment Period. For each Settlement Interval, only the IFM Start-Up Cost in a CAISO IFM Commitment Period is eligible for Bid Cost Recovery. The CAISO will evaluate the IFM Start-Up Costs for Multi-Stage Generating Resources based on the CAISO-committed Cconfiguration. The following rules shall apply sequentially to qualify the IFM Start-Up Cost in an IFM Commitment Period:

(a) The IFM Start-Up Cost for an IFM Commitment Period shall be zero if there is an IFM Self-Commitment Period within or overlapping with that IFM Commitment Period.

(b) The IFM Start-Up Cost for an IFM Commitment Period shall be zero if the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule in the Day-Ahead Market anywhere within the applicable IFM Commitment Period.

(c) The IFM Start-Up Cost for an IFM Commitment Period shall be zero if there is no actual Start-Up at the start of the applicable IFM Commitment Period because the IFM Commitment Period is the continuation of an IFM, RUC, or RTM Commitment Period from the previous Trading Day.

(d) The IFM Start-Up Cost for an IFM Commitment Period shall be zero if the Start-Up is delayed by the Real-Time Market past the IFM Commitment Period in question or cancelled by the Real-Time Market before the start-up process has started.

(e) If an IFM Start-Up is terminated in the Real-Time within the applicable IFM Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource was starting up, the IFM Start-Up Cost for that IFM Commitment Period shall be prorated by the ratio of the Start-Up Time before termination over the total IFM Start-Up Time.

(f) The IFM Start-Up Cost is qualified if an actual Start-Up occurs within the applicable IFM Commitment Period. An actual Start-Up is detected between two consecutive Settlement Intervals when the relevant metered Energy in the applicable Settlement Intervals increases from below the Minimum Load Energy and reaches or exceeds the relevant Minimum Load Energy. The Minimum Load Energy is the product of the relevant Minimum Load and the duration of the

Settlement Interval. The CAISO will evaluate the Minimum Load Energy for Multi-Stage Generating Resources based on the CAISO-committed Cconfiguration.

(g) The IFM Start-Up Cost will be qualified if an actual Start-Up occurs earlier than the start of the IFM Commitment Period if the advance Start-Up is as a result of a Start-Up instruction issued in a RUC or Real-Time Market process subsequent to the IFM, or the advance Start-Up is uninstructed but is still within the same Trading Day and the Bid Cost Recovery Eligible Resource actually stays on until the targeted IFM Start-Up.

11.8.2.1.2 IFM Minimum Load Cost.

The Minimum Load Cost for the applicable Settlement Interval shall be the Minimum Load Cost submitted to the CAISO in the IFM divided by the number of Settlement Intervals in a Trading Hour. For each Settlement Interval, only the IFM Minimum Load Cost in a CAISO IFM Commitment Period is eligible for Bid Cost Recovery. The IFM Minimum Load Cost for any Settlement Interval is zero if: (1) the Settlement Interval is in an IFM Self Commitment Period for the Bid Cost Recovery Eligible Resource; (2) the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule for the applicable Settlement Interval; or (3) the Bid Cost Recovery Eligible Resource is determined not actually On during the applicable Settlement Interval. For the purposes of determining IFM Minimum Load Cost, a Bid Cost Recovery Eligible Resource is assumed to be On if its metered Energy in a Settlement Interval is equal to or greater than the difference between its Minimum Load Energy and the Tolerance Band. Otherwise, it is determined to be Off. The CAISO will evaluate the IFM Minimum Load Costs for Multi-Stage Generating Resources, based on the CAISO-committed Cconfiguration.

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11.8.2.1.5 IFM Energy Bid Cost.

For any Settlement Interval, the IFM Energy Bid Cost for Bid Cost Recovery Eligible Resources, except Participating Loads, shall be the integral of the relevant Energy Bid submitted to the IFM, if any, from the higher of the registered Bid Cost Recovery Eligible Resource's Minimum Load and the Day-Ahead Total

Self-Schedule up to the relevant MWh scheduled in the Day-Ahead Schedule, divided by the number of Settlement Intervals in a Trading Hour. The IFM Energy Bid Cost for Bid Cost Recovery Eligible Resources, except Participating Loads, for any Settlement Interval is set to zero for any portion of the Day-Ahead Schedule that is not delivered from the otherwise Bid Cost Recovery Eligible Resource that has metered Generation below its Day-Ahead Schedule; any portion of the Day-Ahead Schedule that is actually delivered remains eligible for IFM Energy Bid Cost Recovery. The CAISO will evaluate the IFM Energy Bid Cost for a Multi-Stage Generating Resource at the resource level .

11.8.2.1.6 IFM AS Bid Cost.

For any Settlement Interval, the IFM AS Bid Cost shall be the product of the IFM AS Award from each accepted IFM AS Bid and the relevant AS Bid Price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will evaluate and calculate IFM Ancillary Services Bid Cost for a Multi-Stage Generating Resource at the resource level.

11.8.2.1.7 IFM Transition Cost

For each Settlement Interval, the IFM Transition Costs shall be based on the Ceonfiguration to which the Multi-Stage Generating Resource is transitioning and is allocated to the CAISO Ceommitment Pperiod of that Ceonfiguration.

11.8.2.2 IFM Market Revenue.

For any Settlement Interval in a CAISO IFM Commitment Period the IFM Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of: (1) the product of the delivered MWh, in the relevant Day-Ahead Schedule in that Trading Hour where for Pumped-Storage Hydro Units and Participating Load operating in the pumping mode or serving Load, the MWh is negative, and the relevant IFM LMP, divided by the number of Settlement Intervals in a Trading Hour; and (2) the product of the IFM AS Award from each accepted IFM AS Bid and the relevant Resource-Specific ASMP, divided by the number of Settlement Intervals in a Trading Hour. In the case of a Multi-Stage Generating Resource, the CAISO will calculate the market revenue at the resource level. For any Settlement Interval in a IFM Self-Commitment Period the IFM Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of: (1) the product of the delivered MWh above the greater of Minimum Load and Self-Scheduled

Energy, in the relevant Day-Ahead Schedule in that Trading Hour and the relevant IFM LMP, divided by the number of Settlement Intervals in a Trading Hour; and (2) the product of the IFM AS Award from each accepted IFM AS Bid and the relevant Resource-Specific ASMP, divided by the number of Settlement Intervals in a Trading Hour.

* * *

11.8.3.1 RUC Bid Cost Calculation.

For each Settlement Interval, the CAISO shall determine the RUC Bid Cost for a Bid Cost Recovery Eligible Resource as the algebraic sum of the RUC Start-Up Cost, RUC Transition Cost, RUC Minimum Load Cost and RUC Availability Bid Cost. For Multi-Stage Generating Resources, in addition to the specific RUC Bid Cost rules described in Section 11.8.3.1, the rules described in Section 11.8.1.3 will be applied to further determine the applicable Ceonfiguration-based CAISO Market Start-Up Cost, Transition Cost and Minimum Load Cost in any given Settlement Interval.

11.8.3.1.1 RUC Start-Up Cost.

The RUC Start-Up Cost for any Settlement Interval in a RUC Commitment Period shall consist of Start-Up Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the applicable RUC Commitment Period divided by the number of Settlement Intervals in the applicable RUC Commitment Period. For each Settlement Interval, only the RUC Start-Up Cost in a CAISO RUC Commitment Period is eligible for Bid Cost Recovery. The CAISO will evaluate the RUC Start-Up Cost for a Multi-Stage Generating Resource based on the Ceonfiguration committed by the CAISO in RUC. The following rules shall be applied in sequence and shall qualify the RUC Start-Up Cost in a RUC Commitment Period:

(a) The RUC Start-Up Cost for a RUC Commitment Period is zero if there is an IFM Commitment Period within that RUC Commitment Period.

(b) The RUC Start-Up Cost for a RUC Commitment Period is zero if the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or is flagged as an RMR Dispatch in the Day-Ahead Schedule anywhere within that RUC Commitment Period.

(c) The RUC Start-Up Cost for a RUC Commitment Period is zero if there is no RUC Start-Up at the start of that RUC Commitment Period because the RUC Commitment Period is the continuation of an IFM, RUC, or RTM Commitment Period from the previous Trading Day.

(d) The RUC Start-Up Cost for a RUC Commitment Period is zero if the Start-Up is delayed beyond the RUC Commitment Period in question or cancelled by the Real-Time Market prior to the Bid Cost Recovery Eligible Resource starting its start-up process.

(e) If a RUC Start-Up is terminated in the Real-Time within the applicable RUC Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource is starting up the, RUC Start-Up Cost is prorated by the ratio of the Start-Up Time before termination over the RUC Start-Up Time.

(f) The RUC Start-Up Cost for a RUC Commitment Period is qualified if an actual Start-Up occurs within that RUC Commitment Period. An actual Start-Up is detected between two consecutive Settlement Intervals when the relevant metered Energy in the applicable Settlement Intervals increases from below the Minimum Load Energy and reaches or exceeds the relevant Minimum Load Energy. ***[No tolerance band?]*** The Minimum Load Energy is the product of the relevant Minimum Load and the duration of the Settlement Interval. The CAISO will evaluate the Minimum Load Energy for Multi-Stage Generating Resources based on the CAISO-committed Ceonfiguration.

(g) The RUC Start-Up Cost shall be qualified if an actual Start-Up occurs earlier than the start of the RUC Start-Up, if the relevant Start-Up is still within the same Trading Day and the Bid Cost Recovery Eligible Resource actually stays on until the RUC Start-Up, otherwise the Start-Up Cost is zero for the RUC Commitment Period.

11.8.3.1.2 RUC Minimum Load Cost.

The Minimum Load Cost for the applicable Settlement Interval shall be the Minimum Load Cost of the Bid Cost Recovery Eligible Resource divided by the number of Settlement Intervals in a Trading Hour. For each Settlement Interval, only the RUC Minimum Load Cost in a CAISO RUC Commitment Period is eligible for Bid Cost Recovery. The RUC Minimum Load Cost for any Settlement Interval is zero if: (1) the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule in that Settlement Interval; (2) the Bid Cost Recovery Eligible Resource is not actually On in the applicable Settlement Interval; or (3) the applicable Settlement Interval is included in an IFM Commitment Period. For the purposes of determining RUC Minimum Load Cost, a Bid Cost Recovery Eligible Resource is assumed to be On if its metered Energy in a Settlement Interval is equal to or greater than the difference between its Minimum Load Energy and the Tolerance Band. Otherwise, it is determined to be Off. The CAISO will evaluate the RUC Minimum Load Cost for a Multi-Stage Generating Resource based on the Ceonfiguration committed by the CAISO in RUC.

11.8.3.1.3 RUC Availability Bid Cost.

The RUC Availability Bid Cost is calculated as the product of the RUC Award with the relevant RUC Availability Bid price, divided by the number of Settlement Intervals in a Trading Hour. The RUC Availability Bid Cost for a Bid Cost Recovery Eligible Resource for a Settlement Interval is zero if the Bid Cost Recovery Eligible Resource is operating below its RUC Schedule, and also has a negative Uninstructed Imbalance Energy (UIE) magnitude in that Settlement Interval in excess of: (1) five (5) MWh divided by the number of Settlement Intervals in the Trading Hour; or (2) three percent (3%) of its maximum capacity divided by the number of Settlement Intervals in a Trading Hour. The CAISO will evaluate the RUC Availability Bid Cost based on the Multi-Stage Generating Resource resource level.

11.8.2.1.4 RUC Transition Cost

For each Settlement Interval, the RUC Transition Costs shall be based on the configuration to which the Multi-Stage Generating Resource is transitioning and is allocated to the CAISO commitment period of that configuration.

* * *

11.8.3.2 RUC Market Revenues.

For any Settlement Interval, the RUC Market Revenue for a Bid Cost Recovery Eligible Resource is the RUC Availability Payment as specified in Section 11.2.2.1 divided by the number of Settlement Intervals in a Trading Hour. If the RUC Availability Bid Cost of a BCR Eligible Resource is reduced to zero (0) in a Settlement Interval because of Uninstructed Deviation as stated in Section 11.8.3.1.3, then the RUC Market Revenue for that resource for that Settlement Interval shall also be set to zero (0) since the resource is subject to rescission of RUC Availability Payments as specified in Section 31.5.7. The CAISO will evaluate the RUC Market Revenues for Multi-Stage Generating Resources based on the Multi-Stage Generating Resource resource level.

* * *

11.8.4.1 RTM Bid Cost Calculation.

For each Settlement Interval, the CAISO shall calculate RTM Bid Cost for each Bid Cost Recovery Eligible Resource, as the algebraic sum of the RTM Start-Up Cost, RTM Minimum Load Cost, RTM Transition Cost, RTM Pump Shut-Down Cost, RTM Energy Bid Cost, RTM Pumping Cost and RTM AS Bid Cost. For Multi-Stage Generating Resources, in addition to the specific RTM Bid Cost rules described in Section 11.8.4.1, the rules described in Section 11.8.1.3 will be applied to further determine the applicable configuration-based CAISO Market Start-Up Cost, Transition Cost and Minimum Load Cost in a given Settlement Interval.

11.8.4.1.1 RTM Start-Up Cost.

For each Settlement Interval of the applicable Real-Time Market Commitment Period, the Real-Time Market Start-Up Cost shall consist of the Start-Up Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the Real-Time Market divided by the number of Settlement Intervals in the applicable Real-Time Market Commitment Period. For each Settlement Interval, only the Real-Time

Market Start-Up Cost in a CAISO Real-Time Market Commitment Period is eligible for Bid Cost Recovery. The CAISO will evaluate the RTM Start-Up Cost for a Multi-Stage Generating Resource based on the Ceonfiguration committed by the CAISO in RTM. The following rules shall be applied in sequence and shall qualify the Real-Time Market Start-Up Cost in a Real-Time Market Commitment Period:

(a) The Real-Time Market Start-Up Cost is zero if there is a Real-Time Market Self-Commitment Period within the Real-Time Market Commitment Period.

(b) The Real-Time Market Start-Up Cost is zero if the Bid Cost Recovery Eligible Resource has been manually pre-dispatched under an RMR Contract or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule or Real-Time Market anywhere within that Real-Time Market Commitment Period.

(c) The Real-Time Market Start-Up Cost is zero if the Bid Cost Recovery Eligible Resource is started within the Real-Time Market Commitment Period pursuant to an Exceptional Dispatch issued in accordance with Section 34.9.2 to (1) perform Ancillary Services testing; (2) perform pre-commercial operation testing for Generating Units; or (3) perform PMax testing.

(d) The Real-Time Market Start-Up Cost is zero if there is no Real-Time Market Start-Up at the start of that Real-Time Market Commitment Period because the Real-Time Market Commitment Period is the continuation of an IFM or RUC Commitment Period from the previous Trading Day.

(e) If a Real-Time Market Start-Up is terminated in the Real-Time within the applicable Real-Time Market Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource is starting up the Real-Time Market Start-Up Cost is prorated by the ratio of the Start-Up Time before termination over the Real-Time Market Start-Up Time.

(f) The Real-Time Market Start-Up Cost shall be qualified if an actual Start-Up occurs within that Real-Time Market Commitment Period. An actual Start-Up is

detected between two consecutive Settlement Intervals when the relevant metered Energy in the applicable Settlement Intervals increases from below the Minimum Load Energy and reaches or exceeds the relevant Minimum Load Energy. **[No tolerance band?]** The Minimum Load Energy is the product of the relevant Minimum Load and the duration of the Settlement Interval. The CAISO will evaluate the Minimum Load Energy for Multi-Stage Generating Resources based on the CAISO-committed Ceonfiguration.

(g) The Real-Time Market Start-Up Cost for a Real-Time Market Commitment Period shall be qualified if an actual Start-Up occurs earlier than the start of the Real-Time Market Start-Up, if the relevant Start-Up is still within the same Trading Day and the Bid Cost Recovery Eligible Resource actually stays on until the Real-Time Market Start-Up, otherwise the Start-Up Cost is zero for the RUC Commitment Period.

11.8.4.1.2 RTM Minimum Load Cost.

The RTM Minimum Load Cost is the Minimum Load Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the Real-Time Market divided by the number of Settlement Intervals in a Trading Hour. For each Settlement Interval, only the RTM Minimum Load Cost in a CAISO RTM Commitment Period is eligible for Bid Cost Recovery. The RTM Minimum Load Cost for any Settlement Interval is zero if: (1) the Settlement Interval is included in a RTM Self-Commitment Period for the Bid Cost Recovery Eligible Resource; (2) the Bid Cost Recovery Eligible Resource has been manually dispatched under an RMR Contract or the resource has been flagged as an RMR Dispatch in the Day-Ahead Schedule or the Real-Time Market in that Settlement Interval; (3) the Bid Cost Recovery Eligible Resource is not actually On in that Settlement Interval; (4) that Settlement Interval is included in an IFM or RUC Commitment Period; or (5) the Bid Cost Recovery Eligible Resource is committed pursuant to Section 34.9.2 for the purpose of performing Ancillary Services testing, pre-commercial operation testing for Generating Units, or PMax testing. For the purposes of RTM Minimum Load Cost, a Bid Cost Recovery Eligible Resource is determined to not actually be On if the metered Energy in that Settlement Interval is less than the Tolerance Band referenced by the Minimum Load Energy. In addition, the CAISO

will evaluate the Multi-Stage Generating Resource RTM Minimum Load Costs based on the Cconfiguration in which the CAISO commits the Multi-Stage Generating Resource in RTM.

* * *

11.8.4.1.5 RTM Energy Bid Cost.

For any Settlement Interval, the RTM Energy Bid Cost for the Bid Cost Recovery Eligible Resource except Participating Loads shall be computed as the sum of the products of each Instructed Imbalance Energy (IIE) portion, except Standard Ramping Energy, Residual Imbalance Energy, Exceptional Dispatch Energy, Derate Energy, MSS Load Following Energy, Ramping Energy Deviation and Regulating Energy, with the relevant Energy Bid prices, if any, for each Dispatch Interval in the Settlement Interval. The RTM Energy Bid Cost for a Bid Cost Recovery Eligible Resource except Participating Loads for a Settlement Interval is set to zero for any undelivered Real-Time Instructed Imbalance Energy by the Bid Cost Recovery Eligible Resource. Any Uninstructed Imbalance Energy in excess of Instructed Imbalance Energy is also not eligible for Bid Cost Recovery. For a Multi-Stage Generating Resource the CAISO will evaluate the RTM Energy Bid Cost based on the Multi-Stage Generating Resource resource level.

11.8.4.1.6 RTM AS Bid Cost.

For each Settlement Interval, the Real-Time Market AS Bid Cost shall be the product of the average Real-Time Market AS Award from each accepted AS Bid submitted in the Settlement Interval for the Real-Time Market, reduced by any relevant tier-1 No Pay capacity in that Settlement Interval (but not below zero), with the relevant AS Bid price. The average Real-Time Market AS Award for a given AS in a Settlement Interval is the sum of the 15-minute Real-Time Market AS Awards in that Settlement Interval, each divided by the number of 15-minute Commitment Intervals in a Trading Hour and prorated to the duration of the Settlement Interval (10/15 if the Real-Time Market AS Award spans the entire Settlement Interval, or 5/15 if the Real-Time Market AS Award spans half the Settlement Interval). For a Multi-Stage Generating Resource the CAISO will evaluate the RTM AS Bid Cost based on the Multi-Stage Generating Resource resource level.

11.8.4.1.7 RTM Transition Cost

For each Settlement Interval, the RTM Transition Costs shall be based on the C~~c~~onfiguration to which the Multi-Stage Generating Resource is transitioning and ~~is~~ are allocated to the CAISO C~~c~~ommitment P~~p~~eriod of that configuration.

* * *

11.8.4.2 RTM Market Revenue Calculations~~.~~

11.8.4.2.1 For each Settlement Interval in a CAISO Real-Time Market Commitment Period, the RTM Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of the ~~following:~~ elements listed below in this Section. For Multi-Stage Generating Resources the RTM Market Revenue calculations will be made at the resource level.

(a) The sum of the products of the Instructed Imbalance Energy (including Energy from Minimum Load of Bid Cost Recovery Eligible Resources committed in RUC where for Pumped-Storage Hydro Units and Participating Load operating in the pumping mode or serving Load, the MWh is negative), except Standard Ramping Energy, Residual Imbalance Energy, Exceptional Dispatch Energy, Derate Energy, MSS Load following Energy, Ramping Energy Deviation and Regulation Energy, with the relevant Real-Time Market LMP, for each Dispatch Interval in the Settlement Interval;

(b) The product of the Real-Time Market AS Award from each accepted Real-Time Market AS Bid in the Settlement Interval with the relevant ASMP, divided by the number of fifteen (15)-minute Commitment Intervals in a Trading Hour (4), and prorated to the duration of the Settlement Interval.

(c) The relevant tier-1 No Pay charges for that Bid Cost Recovery Eligible Resource in that Settlement Interval.

* * *

11.8.5 Unrecovered Bid Cost Uplift Payment~~.~~

Scheduling Coordinators shall receive an Unrecovered Bid Cost Uplift Payment for a Bid Cost Recovery Eligible Resource, including resources for MSS Operators that have elected gross Settlement, if the net of all IFM Bid Cost Shortfalls and IFM Bid Cost Surpluses calculated pursuant to Section 11.8.2, RUC Bid Cost Shortfalls and RUC Bid Cost Surpluses calculated pursuant to Section 11.8.3, and the RTM Bid Cost Shortfalls and RTM Bid Cost Surpluses calculated pursuant to Section 11.8.4 for that Bid Cost Recovery Eligible Resource over a Trading Day is positive. For Multi-Stage Generating Resources, Unrecovered Bid Cost Uplift Payments will be calculated and made at the resource level and not the configuration level. For MSS Operators that have elected net Settlement, the Unrecovered Bid Cost Uplift Payment is at the MSS level. The MSS IFM, RUC, and RTM Bid Cost Shortfall or IFM. RUC, and RTM Bid Cost Surplus for each market for each Trading Hour is the sum of the IFM, RUC, and RTM Bid Cost Shortfalls and IFM. RUC, and RTM Bid Cost Surpluses for all resources in the MSS. Scheduling Coordinators for MSS Operators that have elected net Settlement will receive an Unrecovered Bid Cost Uplift Payment if the net of all IFM, RUC, and RTM Bid Cost Shortfalls and IFM, RUC, and RTM Bid Cost Surpluses for that MSS over a Trading Day is positive.

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27.8 Multi-Stage Generating Resources

27.8.1 Registration and Qualification

Scheduling Coordinators must comply with the registration and qualification process described in this Section 27.8.1, in order to effectuate any of the changes described in Section 27.8.3. No less than sixteen (16) days prior to the date that a Scheduling Coordinator seeks to have the resource participate in the CAISO Markets under the new settings or configuration details, the Scheduling Coordinator must complete and submit to the CAISO the registration form and the resource data template provided by the CAISO for registration and qualification purposes. After the submission of a request for change in status ***[what is a "change in status"? Does it mean a non-MSG resource becoming an MSG resource? If so, can we say that instead? "Status" is a very broad word.]*** or Ceonfiguration definitions by a Scheduling Coordinator, the CAISO will coordinate with the responsible Scheduling Coordinator to validate that the resource qualifies for the requested status and that all the requisite information has been

successfully provided to the CAISO. The resource will be successfully registered and qualified for the requested status and configuration definitions on the date that the CAISO sends the notification to the responsible Scheduling Coordinator that the resource has been successfully qualified. After the date on which the CAISO has provided this notice, any changes to the items listed in Section 27.8.3 will be subject to the requirements in Section 27.8.1 and 27.9.3. If the CAISO determines that the resource's operating and technical characteristics have changed since the time that the CAISO issued the notice of qualification to the responsible Scheduling Coordinator, the CAISO may request that the Scheduling Coordinator provide additional information necessary to support their registered status and if appropriate may require that the resource be registered and qualified more consistent with the resource's operating and technical characteristics. ***[What happens in the event that the CAISO and the SC cannot agree as to whether a resource qualifies for a certain "status"?]*** Such changes in status or Cconfiguration details would be subject to the registration and qualification requirements in this Section 27.8. Scheduling Coordinators may register the number of Multi-Stage Generating Resource Cconfigurations as are reasonably appropriate for the resource based on the technical and operating characteristics of the resource, which may not, however, exceed a total of ten configurations and cannot be fewer than two configurations. The information requirements specified in Section 27.8.2 will apply.

27.8.2 Informational Requirements

As part of the registration process described in Section 27.8.1, the Scheduling Coordinators for Generating Units or Dynamic Resource-Specific System Resources that seek to qualify as Multi-Stage Generating Resources must submit to the CAISO a transition matrix, which contains the cost and operating constraints associated with feasible transitions between Cconfigurations. The responsible Scheduling Coordinator shall submit for each Cconfiguration a single segment Operational Ramp Rate, and, as applicable, an Operating Reserves ramp rate and Regulating Reserves ramp rate. The Scheduling Coordinator must establish the default Cconfiguration and its associated start-up path that apply to Multi-Stage Generating Resources that are subject to Resource Adequacy must-offer obligations. The Scheduling Coordinator may submit changes to this information consistent with Sections 27.8.3 and 27.8.4. All registered Cconfigurations for Multi-Stage Generating Resources must be operable on-line Cconfigurations.

27.8.3 Changes in Status and Configurations of Resource

Scheduling Coordinators must submit requests for changes to the status and ~~C~~configuration definitions listed below to the CAISO consistent with the process and timing requirements discussed in Section 27.8.1.

[Are the following items what the CAISO intended to be "definitions"? They might be "requirements" but they do not seem to be "definitions".]

(1) Register a Generating Unit or Dynamic Resource-Specific System Resource as a Multi-Stage Generating Resource.

(2) Unregister a Generating Unit or Dynamic Resource-Specific System Resource as a Multi-Stage Generating Resource.

(3) Change the registered ~~C~~configurations for a Multi-Stage Generating Resource, which includes the (a) addition of new ~~C~~configurations; (b) removal of an existing ~~C~~configuration; (c) a material change to the definition of a registered configuration, which includes (i) a change in the physical units supporting the ~~C~~configuration, and (ii) designation of the default Resource Adequacy ~~C~~configuration with the associated default start-up path; or (d) changes of "from" and "to" configurations within the~~ir~~ transition matrix.

Scheduling Coordinators may not modify any of the above settings [are the above definitions, settings or requirements?] or ~~C~~configurations for sixty (60) days after any of these settings or ~~C~~configuration details have taken effect. When transitioning to implement these changes ~~across the midnight hour~~, for any Real-Time Market run in which the changes specified in this Section 27.8.3 are to take effect within the Time Horizon of any of the Real-Time Market runs, the CAISO will Dispatch, Award, or commit ***[the fact that "Dispatch" and "Award" are defined terms strongly suggests that "Commit" should be a defined term, too]*** resources consistent with either the prior or new status and definitions, as appropriate, and required by any Real-Time conditions regardless of the resource's state scheduled in the immediately preceding Day-Ahead Market. Changes to Multi-State Generating Resource characteristics

will take effect at midnight or at the earliest time after midnight the resource is operating in the affected Configuration.

27.8.4 Other Changes to Multi-Stage Generating Resource Characteristics

Scheduling Coordinators may change registered characteristics of resources other than the types of changes listed in Section 27.8.3, pursuant to the relevant provisions for effectuating such changes as specified elsewhere in the CAISO Tariff.

* * *

30.5 Bidding Rules.

30.5.1 General Bidding Rules.

(a) All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the DAM for the following Trading Day shall be submitted at or prior to 10:00 a.m. on the day preceding the Trading Day, but no sooner than seven (7) days prior to the Trading Day. All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the HASP for the following Trading Day shall be submitted starting from the time of publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day, and ending seventy-five (75) minutes prior to each applicable Trading Hour in the RTM. The CAISO will not accept any Energy or Ancillary Services Bids for the following Trading Day between 10:00 a.m. on the day preceding the Trading Day and the publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day;

(b) Bid prices submitted by a Scheduling Coordinator for Energy accepted and cleared in the IFM and scheduled in the Day-Ahead Schedule may be increased or decreased in the HASP. Bid prices for Energy submitted but not scheduled in the Day-Ahead Schedule may be increased or decreased in the HASP. Incremental Bid prices for Energy associated with Day-Ahead AS or RUC Awards in Bids submitted to the HASP may be revised. Scheduling Coordinators

may revise ETC Self-Schedules for Supply only in the HASP to the extent such a change is consistent with TRTC Instructions provided to the CAISO by the Participating TO in accordance with Section 16. Scheduling Coordinators may revise TOR Self-Schedules for Supply only in the HASP to the extent such a change is consistent with TRTC Instructions provided to the CAISO by the Non-Participating TO in accordance with Section 17. Energy associated with awarded Ancillary Services capacity cannot be offered in the HASP or Real-Time Market separate and apart from the awarded Ancillary Services capacity;

(c) Scheduling Coordinators may submit Energy, AS and RUC Bids in the DAM that are different for each Trading Hour of the Trading Day;

(d) Bids for Energy or capacity that are submitted to one CAISO Market, but are not accepted in that market are no longer a binding commitment and Scheduling Coordinators may submit Bids in a subsequent CAISO Market at a different price;

(e) The CAISO shall be entitled to take all reasonable measures to verify that Scheduling Coordinators meet the technical and financial criteria set forth in Section 4.5.1 and the accuracy of information submitted to the CAISO pursuant to this Section 30; and

(f) In order to retain the priorities specified in Section 31.4 and 34.10 for scheduled amounts in the Day-Ahead Schedule associated with ETC and TOR Self-Schedules or Self-Schedules associated with Regulatory Must-Take Generation, a Scheduling Coordinator must submit to the HASP and Real-Time Market ETC or TOR Self-Schedules, or Self-Schedules associated with Regulatory Must-Take Generation, at or below the Day-Ahead Schedule quantities associated with the scheduled ETC, TOR or Regulatory Must-Take Generation Self-Schedules. If the Scheduling Coordinator fails to submit such HASP or Real-Time Market ETC, TOR or Regulatory Must-Take Generation Self-Schedules, the defined scheduling priorities of the ETC, TOR, or Regulatory Must-Take Generation Day-Ahead Schedule quantities may be subject to adjustment in the HASP and the

Real-Time Market as further provided in Section 31.4 and 34.10 in order to meet operating conditions.

(g) For Multi-Stage Generating Resources that receive a Day-Ahead Schedule, are committed in RUC, or receive an Ancillary Services Award, the Scheduling Coordinator must submit an Energy Bid, which may consist of a Self-Schedule, in the Real-Time Market for the same Trading Hour or Trading Hours for ~~either~~ the same C~~c~~onfiguration scheduled or awarded in the Integrated Forward Market or committed in RUC. ***[What happens if one Configuration is specified in IFM and a different Configuration is specified in RUC? Wouldn't the RUC Configuration control?]*** In addition, the Scheduling Coordinator for such Multi-Stage Generating Resources may also submit Bids into the Real-Time Market for two other C~~c~~onfigurations provided that the transitions within the three C~~c~~onfigurations bid into the Real-Time Market are feasible and the transition from the Configuration for~~from~~ the previous Trading Hour are also feasible.

(h) For the Trading Hours that Multi-Stage Generating Resources do not have a CAISO commitment from a prior market ~~they can bid in~~ up to three C~~c~~onfigurations can be bid into the RTM.

(i) The Scheduling Coordinator cannot bid in a C~~c~~onfiguration to the CAISO Markets into which the Multi-Stage Generating Resource cannot transition due to lack of Bids ~~for the specific resource~~ in other C~~c~~onfigurations that are required for the ~~requisite~~ transition. .

(j) In order for Multi-Stage Generating Resource to meet any Resource Adequacy must-offer obligations, the responsible Scheduling Coordinator must submit either as an Economic Bid or Self-Schedule for at least one C~~c~~onfiguration that is capable of fulfilling that Resource Adequacy obligation into the Day-Ahead Market and Real-Time Market ~~that is capable of fulfilling that Resource Adequacy obligation~~

(k) For any given Trading Hour, a Scheduling Coordinator may submit Self-Schedules and/or Submissions to Self-Provide Ancillary Services in only one ~~Multi-Stage Generating Resource~~ registered C~~c~~onfiguration. If in any given Trading Hour the Multi-Stage Generating Resource was awarded Regulation or Operating Reserves in the IFM, any Self-Schedules or Submissions to Self-Provide Ancillary Services the Scheduling Coordinator submits for that Multi-Stage Generating Resource in the RTM must be for the same C~~c~~onfiguration for which Regulation or Operating Reserve is awarded in the IFM ~~for that Multi-Stage Generating Resource in that given Trading Hour~~.

(l) If a Multi-Stage Generating Resource has received a binding RUC Start-Up Instruction as provided in Section 31, any Self-Schedule or Submission to Self-Provide Ancillary Services in the RTM must be in the same C~~c~~onfiguration committed in RUC.

(m) If in any given Trading Hour the Multi-Stage Generating Resource is scheduled for Energy in the IFM, any Self-Schedules the Scheduling Coordinator submits for that Multi-Stage Generating Resource in the RTM must be for the same C~~c~~onfiguration for which Energy is scheduled in IFM ~~for that Multi-Stage Generating Resource in that given Trading Hour~~.

30.5.2 Supply Bids~~.~~

30.5.2.1 Common Elements for Supply Bids~~.~~

In addition to the resource-specific Bid requirements of this Section, all Supply Bids must contain the following components: Scheduling Coordinator ID Code; Resource ID and Multi-Stage Generating Resource C~~c~~onfiguration ID ***[does each Configuration have an ID?]*** as applicable; Resource Location; PNode or Aggregated Pricing Node as applicable; Energy Bid Curve; Self-Schedule component; Ancillary Services Bid; RUC Availability Bid; the Market to which the Bid applies; Trading Day to which the Bid applies; Priority Type (if any). Supply Bids offered in the CAISO Markets must be monotonically increasing. Energy Bids in the RTM must also contain a Bid for Ancillary Services to the extent the

resource is certified and capable of providing Ancillary Service in the RTM up to the registered certified capacity for that Ancillary Service less any Day-Ahead Ancillary Services Awards. Scheduling Coordinators must submit the applicable Supply Bid components, including Self-Schedules, at the registered Ceonfiguration level. ***[Could an MSGR have unregistered Configurations? If not, do we have to refer to registered Configurations?]***

30.5.2.2 Supply Bids for Participating Generators.

In addition to the common elements listed in Section 30.5.2.1, Supply Bids for Participating Generators shall contain the following components: Start-Up Bid, Minimum Load Bid, Ramp Rate, Minimum and Maximum Operating Limits; Energy Limit, Regulatory Must-Take/Must-Run Generation; Contingency Flag; and Contract Reference Number (if any). Scheduling Coordinators submitting these Bid components for a Multi-Stage Generating Resource must do so at the registered Multi-Stage Generating Resource configuration level. A Scheduling Coordinator for a Physical Scheduling Plant or a System Unit may include Generation Distribution Factors as part of its Supply Bid. If the Scheduling Coordinator has not submitted the Generation Distribution Factors applicable for the Bid, the CAISO will use default Generation Distribution Factors stored in the Master File. All Generation Distribution Factors used by the CAISO will be normalized based on Outage data that is available to the automated market systems. ~~Combined-cycle Generating Units may only be registered under a single Resource ID.~~ A Multi-Stage Generating Resource and its Ceonfigurations are registered under a single Resource ID and Scheduling Coordinator for the Multi-Stage Generating Resource must submit all Bids for the resource's configurations under the same Resource ID. For a Multi-Stage Generating Resources Scheduling Coordinators may submit bid curves for up to ten individual registered Ceonfigurations of their Multi-Stage Generating Resources into the Day-Ahead Market and up to three individual registered Ceonfigurations into the Real-Time Market. Scheduling Coordinators for Multi-Stage Generating Resources must submit a single Operational Ramp Rate for each Ceonfiguration for which it submits a supply Bid either in the Day-Ahead Market or Real-Time Market. For Multi-Stage Generating Resources the Scheduling Coordinator may submit the Transition Times for feasible transitions registered in the Master File. The submitted Transition Time cannot be greater than the maximum transition time registered in the Master File. To the extent the Scheduling Coordinator does not submit the Transition Time for a registered

feasible transition, the CAISO will use the registered maximum transition time for that transition for the specific Multi-Stage Generating Resource.

* * *

30.5.2.6 Ancillary Services Bids.

There are four distinct Ancillary Services: Regulation Up, Regulation Down, Spinning Reserve and Non-Spinning Reserve. Participating Generators are eligible to provide all Ancillary Services. Dynamic System Resources are eligible to provide Operating Reserves and Regulation. Non-Dynamic System Resources are eligible to provide Operating Reserves only. No System Resource (including Non-Dynamic Resource-Specific System Resources) can be used for self-provision of Ancillary Services, except for Dynamic System Resources which can be used for self-provision of Ancillary Services as specified in Section 8. All System Resources, including Dynamic Resource-Specific System Resources and Non-Dynamic Resource-Specific System Resources, will be charged the Shadow Price as prescribed in Section 11.10. Participating Loads are eligible to provide Non-Spinning Reserve only. A Scheduling Coordinator may submit Ancillary Services Bids for Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve for the same capacity by providing a separate price in $/MW per hour as desired for each Ancillary Service. The Bid for each Ancillary Services is a single Bid segment. Only resources certified by the CAISO as capable of providing Ancillary Services are eligible to provide Ancillary Services. In addition to the common elements listed in Section 30.5.2.1, all Ancillary Services Bid components of a Supply Bid must contain the following: (1) the type of Ancillary Service for which a Bid is being submitted; (2) Ramp Rate (Operating Reserve Ramp Rate and Regulation Ramp Rate, if applicable); and (3) Distribution Curve for Physical Scheduling Plant or System Unit. A Scheduling Coordinator may only submit an Ancillary Services Bid or Submission to Self-Provide an Ancillary Service for Multi-Stage Generating Resources for the Ancillary Service for which the specific C~~c~~onfigurations are certified. For any such certified C~~c~~onfigurations the Scheduling Coordinator may submit only one Operating Reserve Ramp Rate and Regulation Ramp. An Ancillary Services Bid submitted to the Day-Ahead Market when submitted to the Day-Ahead Market may be, but is not required to be, accompanied by an Energy Bid that covers the capacity offered for the Ancillary Service. Submissions to Self-Provide an Ancillary Services submitted to the Day-Ahead Market when submitted to the Day-Ahead Market may

be, but are not required to be, accompanied by an Energy Bid that covers the capacity to be self-provided; provided, however, that such an Energy Bid shall be submitted prior to the close of the Real-Time Market for the day immediately following the Day-Ahead Market in which the Ancillary Service Bid was submitted if the Submission to Self-Provide an Ancillary Service is qualified as specified in Section 8.6. Submissions to Self-Provide an Ancillary Services submitted in the Day-Ahead Market must be accompanied by a Self-Schedule to which the Submission to Self-Provide an Ancillary Service is related. Except as provided below, the Self-Schedule need not include a Self-Schedule from the resource that will be self-providing the Ancillary Service. If a Scheduling Coordinator is self-providing an Ancillary Service from a Fast Start Unit, no Self-Schedule for that resource is required. If a Scheduling Coordinator proposes to self-provide Spinning Reserve, the Scheduling Coordinator is obligated to submit a Self-Schedule for particular resource, unless as discussed above the particular resource is a Fast Start Unit. When submitting Ancillary Service Bids in the Real-Time, Scheduling Coordinators for resources that either have been awarded or self-provide Spinning Reserve or Non-Spinning Reserve capacity in the Day-Ahead Market must submit an Energy Bid for at least the awarded or self-provided Spinning Reserve or Non-Spinning Reserve capacity, otherwise the CAISO will apply the Bid validation rules described in Section 30.7.6.1. As provided in Section 30.5.2.6.4, a Submission to Self-Provide an Ancillary Service shall contain all of the requirements of a Bid for Ancillary Services with the exception of Ancillary Service Bid price information. In addition, Scheduling Coordinators must comply with the Ancillary Services requirements of Section 8.

* * *

30.5.2.7 RUC Availability Bids~~.~~

Scheduling Coordinators may submit RUC Availability Bids for specific Generating Units in the DAM; however, Scheduling Coordinators for Resource Adequacy Capacity or ICPM Capacity must submit RUC Availability Bids for that capacity to the extent that the capacity has not been submitted in a Self-Schedule or already been committed to provide Energy or capacity in the IFM. For Multi-Stage Generating Resources the RUC Availability Bids shall be submitted for each~~at the~~ C~~c~~onfiguration that is bid into the IFM. Capacity that does not have Bids for Supply of Energy in the IFM will not be eligible to participate in

the RUC process. The RUC Availability Bid component is MW-quantity of non-Resource Adequacy Capacity in $/MW per hour, and $0/MW for Resource Adequacy Capacity or ICPM Capacity.

* * *

30.7.3 DAM Validation.

30.7.3.1 Validation Prior to Market Close and Master File Update.

The CAISO conducts Bid validation in three steps as described below. For a Multi-Stage Generating Resource the validation described herein is done for each at the Ceonfiguration level for which Bids are submitted.:

Step 1: The CAISO will validate all Bids after submission of the Bid for content validation which determines that the Bid adheres to the structural rules required of all Bids as further described in the Business Practices Manuals. If the Bid fails any of the content level rules the CAISO shall assign it a rejected status and the Scheduling Coordinator must correct and resubmit the Bid.

Step 2: After the Bids are successfully validated for content, but prior to the Market Close of the DAM, the Bids will continue through the second level of validation rules to verify that the Bid adheres to the applicable CAISO Market rules and if applicable, limits based on Master File data. If the Bid fails any level two validation rules, the CAISO shall assign the Bid as invalid and the Scheduling Coordinator must either correct or resubmit the Bid.

Step 3: If the Bid successfully passes validation in Step 2, it will continue through the third level of validation where the Bid will be analyzed based on its contents to identify any missing Bid components that must be either present for the Bid to be valid consistent with the market rules contained in Article III of this CAISO Tariff and as reflected in the Business Practice Manuals. At this stage the Bid will either be automatically modified for correctness and assigned a status of conditionally modified or modified, or if it can be accepted as is, the Bid will be assigned a status of conditionally valid, or valid. A Bid will be automatically modified and assigned a status of modified or conditionally modified Bid, whenever the CAISO inserts or modifies a Bid component. The CAISO will insert or modify a Bid component whenever (1) a Self-Schedule quantity is less than the lowest quantity specified as an Economic Bid for either an Energy Bid or Demand Bid, in which case the CAISO extends the Self-Schedule to cover the gap; (2) for

non-Resource Adequacy Resources, the CAISO will extend the Energy Bid Curve using Proxy Costs to cover any capacity in a RUC Bid component, if necessary; and (3) for a Resource Adequacy Resource that is not a Use-Limited Resource, the CAISO will extend the Energy Bid Curve using Proxy Costs to cover any capacity in a RUC Bid component and, if necessary, up to the full registered Resource Adequacy Capacity. The CAISO will generate a Proxy Bid or extend an Energy Bid or Self-Schedule to cover any RUC Award or Day-Ahead Schedule in the absence of any Self-Schedule or Economic Bid components, or to fill in any gaps between any Self-Schedule Bid and any Economic Bid components to cover a RUC Award or Day-Ahead Schedule. To the extent that an Energy Bid to the HASP/RTM is not accompanied by an Ancillary Services Bid, the CAISO will insert a Spinning Reserve and Non-Spinning Reserve Ancillary Services Bid at $ 0/MW for any certified Operating Reserve capacity. The CAISO will also generate a Self-Schedule Bid for any Generating Unit that has a Day-Ahead Schedule but has not submitted Bids in HASP/RTM, up to the quantity in the Day-Ahead Schedule. Throughout the Bid evaluation process, the Scheduling Coordinator shall have the ability to view the Bid and may choose to cancel the Bid, modify and re-submit the Bid, or leave the modified, conditionally modified or valid, conditionally valid Bid as is to be processed in the designated CAISO Market. The CAISO will not insert or extend any Bid for a Resource Adequacy Resource that is a Use-Limited Resource.

* * *

30.7.3.5 Bid Validation Rules for Multi-Stage Generating Resources

If a Scheduling Coordinator does not submit a Bid in the Day-Ahead Market or RTM for a Multi-Stage Generating Resource with a Resource Adequacy must-offer obligation at a C~~c~~onfiguration that can meet an Resource Adequacy must-offer obligation, the ISO will create a Generated Bid for the default Resource Adequacy configuration. If the resource cannot be start-up in the default Resource Adequacy C~~c~~onfiguration ~~is not capable of start up~~ the CAISO will create a Generated Bid for every C~~c~~onfiguration in the ~~registered~~ Default Resource Adequacy Path. If the Scheduling Coordinator submits a Bid for the Multi-Stage Generating Resource, the CAISO will create this Generated Bid for the registered C~~c~~onfigurations before the Market Close, and if it does not submit such a Bid the CAISO will create this Generated Bid after the Market Close. Any Generated Bid created by the CAISO for the default Resource Adequacy configuration will be in addition to the C~~c~~onfigurations bid into the Real-Time Market

by the responsible Scheduling Coordinator. If the Scheduling Coordinator submits a Bid in the Day-Ahead or RTM for a Cconfiguration that is not the default Resource Adequacy Cconfiguration ~~of the MSG~~ and that does not provide the full amount of the resource's RA capacity~~only partly meets the resource's Resource Adequacy requirements~~, the CAISO will create a Generated Bid for the full Resource Adequacy capacity. Before the market closes, if a Scheduling Coordinator submits a Bid in the Day-Ahead or RTM for the default Resource Adequacy Cconfiguration of an Multi-Stage Generating Resource that only meets part of the resource's Resource Adequacy must-offer obligation, the CAISO will extend the last segment of the Energy Bid curve in the submitted Bid for the Multi-Stage Generating Resource up to the Multi-Stage Generating Resource's Resource Adequacy must-offer obligation. After the market closes, to the extent that no Bid is submitted into the Real-Time Market for a Multi-Stage Generating Resource scheduled in the Integrated Forward Market as required in Section 30.5 the CAISO will create a Self-Schedule equal to the Day-Ahead Schedule for that resource for the Cconfiguration scheduled in the IFM ~~equal to the Day-Ahead Schedule for that resource~~. To the extent a Multi-Stage Generating Resource is awarded Operating Reserves in the Day-Ahead Market and no Economic Energy Bids are~~is~~ submitted for that resource in the Real-Time Market, the CAISO will insert a Proxy Energy Bid in the Cconfiguration that was awarded in the Day-Ahead Market to cover the awarded Operating Reserves.. To the extent that an Multi-Stage Generating Resource's RUC Schedule is greater than its~~the~~ Day-Ahead Schedule, if the Scheduling Coordinator does not submit an Energy Bid in the RTM to cover the difference, then the CAISO will either create~~s~~ an Energy Bid in the configuration committed in RUC, or extends the Energy Bid that they did submit ~~if there is one~~ before the Market Close. After the Market Close, the CAISO will create a Generated Bid if there is no Energy Bid submitted for the resource for this difference. The CAISO will validate that the combination of the Day-Ahead Ancillary Services Awards and Submissions to Self-Provide Ancillary Services are feasible with respect to the physical operating characteristics of the Multi-Stage Generating Resource. The CAISO will reject Ancillary Services Bids or Submissions to Self-Provide Ancillary Services for Cconfigurations that are not certified to provide Ancillary Services. For any given Multi-Stage Generating Resource, for any given CAISO Market and Trading Hour if the Bids for one Cconfiguration~~'s Bid~~ fails the bid validation process, all other Bids for all other Cconfigurations are also

invalidated. ***[Will the CAISO~~o~~ provide information to the SC so it is quickly and plainly evident which Bids triggered the rejection?]***

* * *

30.7.8 Format and Validation of Start-Up and Shut-Down Times.

For a Generating Unit or a Resource-Specific System Resource, the submitted Start-Up Time expressed in minutes (min) as a function of down time expressed in minutes (min) must be a staircase function with up to three (3) segments defined by a set of 1 to 4 down time and Start-Up Time pairs. The Start-Up Time is the time required to start the resource if it is offline longer than the corresponding down time. The ISO models Start-Up Times for Multi-Stage Generating Resource for each ~~at the C~~configuration ~~level~~ and Multi-Stage Generating Resource transition times are validated based on the Multi-Stage Generating Resource transition matrix submitted as provided in Section 27.8. The last segment will represent the time to start the unit from a cold start and will extend to infinity. The submitted Start-Up Time function shall be validated as follows:

(a) The first down time must be zero (0) min.

(b) The down time entries must match exactly (in number, sequence, and value) the corresponding down time breakpoints of the maximum Start-Up Time function, as registered in the Master File for the relevant resource.

(c) The Start-Up Time for each segment must not exceed the Start-Up Time of the corresponding segment of the maximum Start-Up Time function, as registered in the Master File for the relevant resource.

(d) The Start-Up Time function must be strictly monotonically increasing, i.e., the Start-Up Time must increase as down time increases.

For Participating Load, a single Shut-Down time in minutes is the time required for the resource to Shut-Down after receiving a Dispatch Instruction. For a Multi-Stage Generating Resource ~~resources~~ transition time is the time required for~~to~~ the resource to transition from one C~~c~~onfiguration to another.

30.7.9 Format and Validation of Start-Up Costs and Shut-Down Costs.

For a Generating Unit or a Resource-Specific System Resource, the submitted Start-Up Cost expressed in dollars ($) as a function of down time expressed in minutes must be a staircase function with up to three (3) segments defined by a set of 1 to 4 down time and Start-Up Cost pairs. The Start-Up Cost is the cost incurred to start the resource if it is offline longer than the corresponding down time. The last segment will represent the cost to start the resource from cold Start-Up and will extend to infinity. The submitted Start-Up Cost function shall be validated as follows:

(a) The first down time must be zero (0) min.

(b) The down time entries must match exactly (in number, sequence, and value) the corresponding down time breakpoints of the Start-Up Cost function, as registered in the Master File for the relevant resource as either the Proxy Cost or Registered Cost.

(c) The Start-Up Cost for each segment must not be negative and must be equal to the Start-Up Cost of the corresponding segment of the Start-Up Cost function, as registered in the Master File for the relevant resource. If a value is submitted in a Bid for the Start-Up Cost, it will be overwritten by the Master File value as either the Proxy Cost or Registered Cost based on the option elected pursuant to Section 30.4. If no value for Start-Up Cost is submitted in a Bid, the CAISO will insert the Master File value, as either the Proxy Cost or Registered Cost based on the option elected pursuant to Section 30.4.

(d) The Start-Up Cost function must be strictly monotonically increasing, i.e., the Start-Up Cost must increase as down time increases.

For Participating Loads, a single Shut-Down Cost in dollars ($) is the cost incurred to Shut-Down the resource after receiving a Dispatch Instruction. The submitted Shut-Down Cost must not be negative. For Multi-Stage Generating Resources the Start-Up Costs must be provided for each~~by C~~configuration~~s~~ into which the resource can be started.

* * *

31.2.2.2 Non-RMR Units~~.~~

If the dispatch level produced through the ACR is greater than the dispatch level produced through CCR, then the resource is subject to Local Market Power Mitigation, in which case the entire portion of the unit's Energy Bid Curve that is above the CCR dispatch level will be mitigated to the lower of the Default Energy Bid as specified in Section 39, or the DAM Bid, but no lower than the unit's highest Bid price that cleared the CCR. In the case of Multi-Stage Generating Resource, the CAISO will perform any applicable Local Market Power Mitigation on a Cconfiguration-by-Cconfiguration basis and will flag individual Cconfigurations' Bids for mitigation. To the extent a Multi-Stage Generating Resource's MWhs cleared in the All Constraints Run is greater than the MWhs cleared in the Competitive Constraints Run, the CAISO will evaluate for purposes of mitigation all Energy Bids for all configurations that are submitted based on the relevant Default Energy Bids for the applicable configuration . The CAISO will calculate the Default Energy Bids for Multi-Stage Generating Resources by configuration. When the ACR dispatch level is higher than the CCR level, the market Bid at and below the CCR dispatch level will be retained in the IFM. If the dispatch level produced through the ACR is not greater than the dispatch level produced through the CCR, the unit's original, unmitigated DAM Bid will be retained in its entirety. ***Does the CAISO use "MWHs cleared" as a synomym for "the operating level to which the resource is dispatched" outside of using it for MSGRs?]***

31.3 Integrated Forward Market.

After the MPM-RRD and prior to RUC, the CAISO shall perform the IFM. The IFM (1) performs Unit Commitment and Congestion Management (2) clears mitigated or unmitigated Bids cleared in the MPM-RRD as well as Bids that were not cleared in the MPM-RRD process against bid-in Demand, taking into account transmission limits and honoring technical and inter-temporal operating Constraints, such as Minimum Run Times (3) and procures Ancillary Services to meet one hundred percent (100%) of the CAISO Forecast of CAISO Demand requirements. The IFM utilizes a set of integrated programs that: (1) determine Day-Ahead Schedules and AS Awards, and related LMPs and ASMPs; and (2) optimally commits resources that are bid in to the DAM. The IFM utilizes a SCUC algorithm that optimizes Start-Up Costs, Minimum Load Costs, Transition Costs, and Energy Bids along with any Bids for Ancillary Services as well as Self-Schedules submitted by Scheduling Coordinators. The IFM selects the optimal Configuration from optimizes up to ten Cconfigurations of each Multi-Stage Generating Resource as a

mutually exclusive resources. The IFM also provides for the optimal management of Use-Limited Resources. The ELS Resources committed through the ELC Process conducted two days before the day the IFM process is conducted for the next Trading Day as described in Section 31.7 are binding.

31.3.1 Market Clearing and Price Determination.

31.3.1.1 Integrated Forward Market Output.

The IFM produces: (1) a set of hourly Day-Ahead Schedules, AS Awards, and AS Schedules for all participating Scheduling Coordinators that cover each Trading Hour of the next Trading Day; and (2) the hourly LMPs for Energy and the ASMPs for Ancillary Services to be used for settlement of the IFM. For a Multi-Stage Generating Resource, the IFM produces a Day-Ahead Schedule for no more than one configuration per Trading Hour. In addition, the IFM will produce the transition and the Ceonfiguration indicators for the Multi-Stage Generating Resource, which would establish the expected Ceonfiguration in which the Multi-Stage Generating Resource will operate. During a transition, the committed Ceonfiguration is considered to be the "from" configuration. The CAISO will publish the LMPs at each PNode as calculated in the IFM. In determining Day-Ahead Schedules, AS Awards, and AS Schedules the IFM optimization will minimize total Bid Costs based on submitted and mitigated Bids while respecting the operating characteristics of resources, the operating limits of transmission facilities, and a set of scheduling priorities that are described in Section 31.4. In performing its optimization, the IFM first tries to complete its required functions utilizing Effective Economic Bids without adjusting Self-Schedules, and skips Ineffective Economic Bids and adjusts Self-Schedules only if it is not possible to balance Supply and Demand and manage Congestion in an operationally prudent manner with available Effective Economic Bids. The process and criteria by which the IFM adjusts Self-Schedules and other Non-priced Quantities are described in Sections 27.4.3, 31.3.1.3 and 31.4. The Day-Ahead Schedules are binding commitments, including the commitment to Start-Up, if necessary, to comply with the Day-Ahead Schedules. The CAISO will not issue separate Start-Up Instructions for Day-Ahead commitments. A resource's status, however, can be modified as a result of additional market processes occurring in the HASP and RTM.

31.3.1.2 Treatment of Ancillary Services Bids in IFM.

As provided in Section 30.7.6.2 the CAISO shall co-optimize the Energy and Ancillary Services Bids in clearing the IFM. To the extent that capacity subject to an Ancillary Services Bid submitted in the Day-Ahead Market is not associated with an Energy Bid, there is no co-optimization, and therefore, no opportunity cost associated with that resource for that Bid for the purposes of calculating the Ancillary Services Marginal Price as specified in Section 27.1.2.2. When the capacity associated with the Energy Bid overlaps with the quantity submitted in the Ancillary Services Bid, then the Energy Bid will be used to determine the opportunity cost, if any, in the co-optimization to the extent of the overlap. Therefore, the capacity that will be considered when co-optimizing the procurement of Energy and Ancillary Services from Bids in the IFM will consider capacity up to the total capacity of the resource as reflected in the Ancillary Services Bid as derated through SLIC, if at all. In the case of Regulation, the capacity that will be considered is the lower of the capacity of the resource offered in the Ancillary Services Bid or the upper Regulation limit of the highest Regulating Range as contained in the Master File. For any Trading Hour in which the Multi-Stage Generating Resource is transitioning from one Configuration to another Confirugation,~~in a transition period~~, the IFM will not award Ancillary Services and any Self-Provided Ancillary Services will be disqualified. Any Ancillary Services Awards in the IFM to Multi-Stage Generating Resources will carry through to the Real-Time Market in the same C~~c~~onfiguration that the Multi-Stage Generating Resource is awarded ***[committed? Need to be consistent.]*** in the IFM.

* * *

31.3.1.4 Eligibility to Set the Day-Ahead LMP.

All Generating Units, Participating Loads, non-Participating Loads, System Resources, System Units, or Constrained Output Generators subject to the provisions in Section 27.7, with Bids, including Generated Bids, that are unconstrained due to Ramp Rates, Multi-Stage Generating Resource transitions, Forbidden Operating Regions, or other temporal constraints are eligible to set the LMP, provided that (a) the Schedule for the Generating Unit or Resource-Specific System Resource is between its Minimum Operating Limit and the highest MW value in its Economic Bid or Generated Bid, or (b) the Schedule for the Participating Load, non-Participating Load, non-Resource-Specific System Resource, or System Unit is between zero (0) MW and the highest MW value in its Economic Bid or Generated Bid. If (a) a resource's Schedule is constrained by its Minimum Operating Limit or the highest MW value in its

Economic Bid or Generated Bid, (b) the CAISO enforces a resource-specific constraint on the resource due to an RMR or Exceptional Dispatch, (c) the resource is constrained by a boundary of a Forbidden Operating Region or is Ramping through a Forbidden Operating Region, or (d) the resource's full Ramping capability is constraining its inter-hour change in Schedule, the resource cannot be marginal and thus is not eligible to set the LMP. Resources identified as MSS Load following resources are not eligible to set the LMP. A Constrained Output Generator will be eligible to set the hourly LMP if any portion of its Energy is necessary to serve Demand.

* * *

31.5 Residual Unit Commitment.

The CAISO shall perform the RUC process after the IFM. In the event that the IFM did not commit sufficient resources to meet the CAISO Forecast of CAISO Demand and account for other factors such as Demand Forecast error, as described in the Business Practice Manuals, the RUC shall commit additional resources and identify additional RUC Capacity to ensure sufficient on-line resources to meet Demand for each hour of the next Trading Day. RUC Capacity is selected by a SCUC optimization that uses the same Base Market Model used in the IFM adjusted as described in Section 27.5.1 and 27.5.6 to help ensure the deliverability of Energy from the RUC Capacity. In the case of Multi-Stage Generating Resources, the RUC will optimize Transition Costs in addition to optimizing the Start-Up and Minimum Load Costs. ***[Does the CAISO mean it will optimize Transition Costs separately or optimize SU ML and TC as a whole?]***

31.5.1 RUC Participation.

31.5.1.1 Capacity Eligible for RUC Participation.

RUC participation is voluntary for capacity that has not been designated as Resource Adequacy Capacity. Scheduling Coordinators may make such capacity available for participation in RUC by submitting a RUC Availability Bid, provided the Scheduling Coordinator has also submitted an Energy Bid for such capacity into the IFM. Capacity from Non-Dynamic System Resources that has not been designated Resource Adequacy Capacity is not eligible to participate in RUC. Capacity from resources including System Resources that has been designated as qualified Resource Adequacy Capacity must

participate in RUC. RUC participation is required for Resource Adequacy Capacity to the extent that Resource Adequacy Capacity is not committed following the IFM. System Resources eligible to participate in RUC will be considered on an hourly basis; that is, RUC will not observe any multi-hour block constraints. The CAISO may commit in RUC a Multi-Stage Generating Resource with a Resource Adequacy must-offer obligation at any Cconfiguration with capacity equal to or greater than the Cconfiguration committed in the Integrated Forward Market. RUC will observe the Energy Limits that may have been submitted in conjunction with Energy Bids to the IFM. RMR Unit capacity will be considered in RUC in accordance with Section 31.5.1.3. MSS resources may participate in RUC in accordance with Section 31.5.2.3. COG resources are accounted for in RUC, but may not submit or be paid RUC Availability Payments. The ELS Resources committed through the ELC Process conducted two days before the day the RUC process is conducted for the next Trading Day as described in Section 31.7 are binding.

31.5.1.2 RUC Availability Bids.

Scheduling Coordinators may only submit RUC Availability Bids for capacity (above the Minimum Load) for which they are also submitting an Energy Bid to participate in the IFM. The RUC Availability Bid for the Resource Adequacy Capacity submitted by a Scheduling Coordinator must be $0/MW per hour for the entire Resource Adequacy Capacity. If the Scheduling Coordinator fails to submit a $0/MW per hour for Resource Adequacy Capacity, the CAISO will insert the $0/MW per hour for the full amount of Resource Adequacy Capacity for a given resource reduced by any upward Ancillary Services awards. For MSGs, for resources that fail to submit a $0/MW per hour for their Resource Adequacy Capacity, the CAISO will insert the $0/MW per hour for the resource's Resource Adequacy Capacity at the Cconfiguration level up to the minimum of the Resource Adequacy Capacity or the PMax of the Cconfiguration. Scheduling Coordinators may submit non-zero RUC Availability Bids for the portion of a resource's capacity that is not Resource Adequacy Capacity.

* * *

31.5.1.4 Eligibility to Set the RUC Price.

All resources that are eligible for RUC participation as described in Section 31.5.1.1 with RUC Bids that are unconstrained due to Ramp Rates or other temporal constraints, including Multi-Stage Generating Resource transitions, are eligible to set the RUC Price, provided that (a) the RUC Schedule for the Generating Unit or Resource-Specific System Resource is between its Minimum Operating Limit and the highest MW value in its Economic Bid or Generated Bid, or (b) the Schedule for the eligible resource other than a Generating Unit or Resource-Specific System Resource is between zero (0) MW and the highest MW value in its Economic Bid or Generated Bid. If (a) a resource's Schedule is constrained by its Minimum Operating Limit or the highest MW value in its Economic Bid or Generated Bid, (b) the CAISO enforces a resource-specific constraint on the resource due to an RMR or Exceptional Dispatch or (c) the resource's full Ramping capability is constraining its inter-hour change in Schedule, the resource cannot be marginal and thus is not eligible to set the RUC Price. Resources identified as MSS Load following resources are not eligible to set the RUC Price.

* * *

31.5.5 Selection and Commitment of RUC Capacity.

Capacity that is not already scheduled in the IFM may be selected as RUC Capacity through the RUC process of the DAM. The RUC optimization will select RUC Capacity and produce nodal RUC Prices by minimizing total Bid cost based on RUC Availability Bids and Start-Up, and Minimum Load Bids and Transition Costs. RUC will not consider Start-Up, and Minimum Load Bids, or Transition Costs for resources already committed in the IFM. The RUC Capacity of a resource is the incremental amount of capacity selected in RUC above the resource's Day-Ahead Schedule. The resource's Day-Ahead Schedule plus its RUC Capacity comprise the resource's RUC Schedule. The CAISO will only issue RUC Start-Up Instructions to resources committed in RUC that must receive a Start-Up Instruction in the Day-Ahead in order to be available to meet Real-Time Demand. RUC Schedules will be provided to Scheduling Coordinators even if a RUC Start-Up Instruction is not issued at that time. RUC shall not shut down resources reverse commitments started upissued through the IFM. If the RUC process cannot find a feasible solution given the resources committed in the IFM, the RUC process will adjust Constraints as described in Section 31.5.4 to arrive at a feasible solution that accommodates all the resources

committed in the IFM, and any necessary de-commitment of IFM committed units shall be effectuated through an Exceptional Dispatch.

31.5.6 Eligibility for RUC Compensation.

All RUC Capacity is eligible for the RUC Availability Payment except for: (i) RUC Capacity from RMR Units that has been designated as RMR Dispatch and included in RUC as a Self-Schedule; (ii) Resource Adequacy Capacity; and (iii) RUC Capacity that corresponds to the resource's Minimum Load, which is compensated through the Bid Cost Recovery as described in Section 11.8. Resources not committed in the IFM that are committed in RUC, including RMR Units that were not designated for RMR Dispatches and Resource Adequacy Resources, are also eligible for RUC Cost Compensation, which includes Start-Up, Transition Costs, and Minimum Load Cost compensation, and Bid Cost Recovery, subject to the resource actually following its Dispatch Instructions as verified by the CAISO pursuant to procedures set forth in the Business Practice Manuals.

31.5.7 Rescission of Payments for Undispatchable and Undelivered RUC Capacity.

If capacity committed in RUC provided from a Generating Unit, Participating Load, System Unit or System Resource is Undispatchable Capacity or Undelivered Capacity during the relevant Settlement Interval, then payments will be rescinded as described in this Section 31.5.7 and settled in accordance with Section 11.2.2.2. If the CAISO determines that non-compliance of a Participating Load, Generating Unit, System Unit or System Resource with an operating order or Dispatch Instruction from the CAISO, or with any other applicable technical standard under the CAISO Tariff, causes or exacerbates system conditions for which the WECC imposes a penalty on the CAISO, then the Scheduling Coordinator of such Participating Load, Generating Unit, System Unit or System Resource shall be assigned that portion of the WECC penalty which the CAISO reasonably determines is attributable to such non-compliance, in addition to any other penalties or sanctions applicable under the CAISO Tariff. The rescission of payments in this Section 31.5.7 shall not apply to a capacity payment for any particular RUC Capacity if the RUC Availability Payment is less than or equal to zero.

31.5.7.1 Rescission of Payments for Undispatchable RUC Capacity.

The CAISO shall calculate the Real-Time ability of each Generating Unit, Participating Load, System Unit or System Resource to deliver Energy from or capacity committed in RUC for each Settlement Interval based on its maximum operating capability, actual telemetered output, and Operational Ramp Rate as described in Section 30.10, which for a Multi-Stage Generating Resource is evaluated for each ~~at the~~ configuration ~~level~~. If the Undispatchable Capacity is capacity committed in RUC and is from a Generating Unit, System Unit or System Resource that is a Resource Adequacy Resource, there is no payment obligation to the CAISO for the Undispatchable Capacity. The CAISO will report the instance of non-compliance by the Resource Adequacy Resource to the appropriate Local Regulatory Authority.

31.5.7.2 Rescission of Payments for Undelivered RUC Capacity.

For each Settlement Interval in which a Generating Unit, Participating Load, System Unit or System Resource fails to supply Energy from capacity committed in RUC in accordance with a Dispatch Instruction, or supplies only a portion of the Energy specified in the Dispatch Instruction, the RUC Availability Payment will be reduced to the extent of the deficiency, in accordance with the provisions of Section 11.2.2.2.2, which for a Multi-Stage Generating Resource is evaluated at the resource level.

* * *

34.2 Real-Time Unit Commitment~~.~~

The Real-Time Unit Commitment (RTUC) process uses SCUC and is run every fifteen (15) minutes to: (1) make commitment decisions for Fast Start and Short Start resources having Start-Up Times within the Time Horizon of the RTUC process, and (2) procure required additional Ancillary Services and calculate ASMP used for settling procured Ancillary Service capacity for the next fifteen-minute Real-Time Ancillary Service interval. In any fifteen minute RTUC interval that a Multi-Stage Generating Resource is transitioning between Configurations ~~in transition~~, the CAISO: (1) will not award any incremental Ancillary Services; (2) will disqualify any Day-Ahead Ancillary Services Awards; (3) will disqualify Day-Ahead qualified Submissions to Self-Provide Ancillary Services Award, and (4) will disqualify Submissions to Self-Provide Ancillary Services in RTM. In addition, the RTUC will not transition Multi-Stage Generating Resources with transition times longer than the RTUC Time Horizon. ***[How long is that? Where in the tariff it is specified?]*** A Transition Instruction is considered binding in a given RTUC run if the Transition

Time of the resource is such that there would not be sufficient time for a subsequent RTUC run to transition the resource, otherwise the Transition Instruction is considered advisory. ***[How will the SC know if the Transition Instruction is binding or mandatory?]*** For Multi-Stage Generating Resources the RTUC will issue the binding Transition Instruction separately from the binding Start-Up or Shut Down instructions. The RTUC can also be run with the Contingency Flag activated, in which case the RTUC can commit Contingency Only Operating Reserves. If RTUC is run without the Contingency Flag activated, it cannot commit Contingency Only Operating Reserves. RTUC is run four times an hour, at the following times for the following Time Horizons: (1) at approximately 7.5 minutes prior to the next Trading Hour, in conjunction with the HASP run, for T-45 minutes to T+60 minutes; (2) at approximately 7.5 minutes into the current hour for T-30 minutes to T+60 minutes; (3) at approximately 22.5 minutes into the current hour for T-15 minutes to T+60 minutes; and (4) at approximately 37.5 minutes into the current hour for T to T+60 minutes where T is the beginning of the next Trade Hour. The HASP, described in Section 33, is a special RTUC run that is performed at approximately 7.5 minutes before each hour and has the additional responsibility of: (1) pre-dispatching Energy and awarding Ancillary Services for hourly dispatched System Resources for the Trading Hour that begins 67.5 minutes later, and (2) performing the necessary MPM-RRD for that Trading Hour. In the RTUC if a Multi-Stage Generating Resource C~~c~~onfiguration committed in the IFM or RUC that is later impacted by the resource's derate or outages, the CAISO will re-optimize ***[what wil be re-optimized?]*** taking into consideration the impacts of the derate or outage on the available C~~c~~onfigurations.

34.2.1 Commitment of Fast Start and Short Start Resources~~.~~

RTUC produces binding and advisory Start-Up and Shut-Down Dispatch Instructions for Fast Start and Short Start resources that have Start-Up Times that would allow the resource to be committed prior to the end of the relevant Time Horizon of the RTUC run. A Start-Up Dispatch Instruction is considered binding in any given RTUC run if the Start-Up Time of the resource is such that there would not be sufficient time for a subsequent RTUC run to ~~could not achieve the target start time as determined in the current RTUC run in a subsequent RTUC run as a result of the~~ Start-Up ~~Time of~~ the resource. A Start-Up Instruction is considered advisory if it is not binding, such that the resource could achieve its target Start-Up Time as determined in the current RTUC run in a subsequent RTUC run based on its Start-Up Time. A Shut-

Down Instruction is considered binding if the resource could achieve the target Shut-Down Time as determined in the current RTUC in a subsequent RTUC run. A Shut-Down Dispatch Instruction is considered advisory if the resource Shut-Down Instruction is not binding such that the resource could achieve its target Shut-Down time as determined in the current RTUC run in a subsequent RTUC run. A binding Dispatch Instruction that results in a change in Commitment Status will be issued, in accordance with Section 6.3, after review and acceptance of the Start-Up Instruction by the CAISO Operator. An advisory Dispatch Instruction changing the Commitment Status of a resource may be modified by the CAISO Operator to a binding Dispatch Instruction and communicated in accordance with Section 6.3 after review and acceptance by the CAISO Operator. Only binding and not advisory Dispatch Instructions will be issued by the CAISO. For Multi-Stage Generating Resources the CAISO will also issue binding Transition Instructions when the Multi-Stage Generating Resource must change from one Cconfiguration to another. A Transition Instruction is considered binding in any given RTUC run if the Transition Time of that transition for that resource is such that there would not be sufficient time for a subsequent RTUC run to transition the resource. ***[Again – will the SC know whether the instruction is binding or advisory?]***

* * *

34.4 Short-Term Unit Commitment.

At the top of each Trading Hour, immediately after the RTUC run is completed, the CAISO performs an approximately five (5) hour Short-Term Unit Commitment (STUC) run using SCUC and the CAISO Forecast of CAISO Demand to commit Medium Start Units and Short Start Units with Start-Up Times greater than the Time Horizon covered by the RTUC. The Time Horizon for the STUC optimization run will extend three hours beyond the Trading Hour for which the RTUC optimization was run, and will replicate the Bids used in that Trading Hour for these additional hours. The CAISO revises these replicated Bids each time the hourly STUC is run, to utilize the most recently submitted Bids. A Start-Up Instruction produced by STUC is considered binding if the resource could not achieve the target Start-Up Time as determined in the current STUC run in a subsequent RTUC or STUC run as a result of the Start-

Up Time of the resource. A Start-Up Instruction produced by STUC is considered advisory if it is not binding, such that the resource could achieve its target start time as determined in the current RTUC run in a subsequent STUC or RTUC run based on its Start-Up Time. A binding Dispatch Instruction produced by STUC that results in a change in Commitment Status will be issued, in accordance with Section 6.3, after review and acceptance of the Start-Up Instruction by the CAISO Operator. The STUC will only decommit a resource to the extent that resource's physical characteristics allow it to be cycled in the same Time Horizon for which it was decommitted. STUC does not produce prices for Settlement. In the STUC, if a Multi-Stage Generating Resource Ceonfiguration committed in the IFM or RUC ~~that~~ is later impacted by the resource's derate or outage, the CAISO will re-optimize ***[again, re-optimize what?]*** taking into consideration the impacts of the derate or outage on the available Ceonfigurations.

34.5 General Dispatch Principles.

The CAISO shall conduct all Dispatch activities consistent with the following principles:

(1) The CAISO shall issue AGC instructions electronically as often as every four seconds from its Energy Management System (EMS) to resources providing Regulation and on Automatic Generation Control to meet NERC and WECC performance requirements;

(2) In each run of the RTED or RTCD the objective will be to meet the projected Energy requirements over the Time Horizon of that run, subject to transmission and resource operational Constraints, taking into account the short term CAISO Forecast of CAISO Demand adjusted as necessary by the CAISO Operator to reflect scheduled changes to Interchange and non-dispatchable resources in subsequent Dispatch Intervals;

(3) Dispatch Instructions will be based on Energy Bids for those resources that are capable of intra-hour adjustments and will be determined through the use of SCED except when the CAISO must utilize the RTMD;

(4) When dispatching Energy from awarded Ancillary Service capacity the CAISO will not differentiate between Ancillary Services procured by the CAISO and Submissions to Self-Provide an Ancillary Service;

(5) The Dispatch Instructions of a resource for a subsequent Dispatch Interval shall take as a point of reference the actual output obtained from either the State Estimator solution or the last valid telemetry measurement and the resource's operational ramping capability. For Multi-Stage Generating Resource the point of reference is further evaluated for each ~~at the~~ configuration ~~level~~ and is also based on the Transition Matrix; ***[How does the Transition Matrix influence the point of reference? Should "point of reference" be a defined term?]***

(6) In determining the Dispatch Instructions for a target Dispatch Interval while at the same time achieving the objective to minimize Dispatch costs to meet the forecasted conditions of the entire Time Horizon, the Dispatch for the target Dispatch Interval will be affected by: (a) Dispatch Instructions in prior intervals, (b) actual output of the resource, (c) forecasted conditions in subsequent intervals within the Time Horizon of the optimization, and (d) operational Constraints of the resource, such that a resource may be dispatched in a direction for the immediate target Dispatch Interval that is different than the direction of change in Energy needs from the current Dispatch Interval to the next immediate Dispatch Interval, considering the applicable C~~c~~onfiguration ~~level~~ for Multi-Stage Generating Resources;

(7) Through Start-Up Instructions the CAISO may instruct resources to start up or shut down, or may reduce Load for Participating Loads, over the Time Horizon for the RTM based on submitted Bids, Start-Up Costs and Minimum Load Costs, Pumping Costs and Pump Shut-Down Costs, as appropriate for the resource, or for Multi-Stage Generating Resource as appropriate for the applicable C~~c~~onfiguration, consistent with operating characteristics of the resources that the SCED is able to enforce. In making Start-Up or Shut-Down decisions in the

RTM, the CAISO may factor in limitations on number of run hours or Start-Ups of a resource to avoid exhausting its maximum number of run hours or Start-Ups during periods other than peak loading conditions;

(8) The CAISO shall only start up resources that can start within the Time Horizon used by the RTM optimization methodology;

(9) The RTM optimization may result in resources being shut down consistent with their Bids and operating characteristics provided that: (1) the resource does not need to be on-line to provide Energy, (2) the resource is able to start up within the RTM optimization Time Horizon, (3) the Generating Unit is not providing Regulation or Spinning Reserve, and (4) Generating Units online providing Non-Spinning Reserve may be shut down if they can be brought up within ten (10) minutes as such resources are needed to be online to provide Non-Spinning Reserves; ~~and~~

(10) For resources that are both providing Regulation and have submitted Energy Bids for the RTM, Dispatch Instructions will be based on the Regulation Ramp Rate of the resource rather than the Operational Ramp Rate if the Dispatch Operating Point remains within the Regulating Range. The Regulating Range will limit the Ramping of Dispatch Instructions issued to resources that are providing Regulation~~.~~;

(11) For Multi-Stage Generating Resources CAISO will issue Dispatch Instructions by Multi-Stage Generating Resource Resource ID and Configuration ID;

(12) Through Transition Instructions the CAISO may instruct resources to Transition from one C~~c~~onfiguration to another over the Time Horizon for the RTM based on submitted Bids, Transition Costs and Minimum Load Costs, as appropriate ~~for Multi-Stage Generating Resource~~ for the C~~c~~onfigurations involved in the transition, consistent with the Multi-Stage Generating Resource T~~t~~ransition M~~m~~atrix and operating characteristics of the~~se~~ configurations. The RTM

optimization may factor in limitations on daily maximum number of transitions between configuration as defined in the T~~t~~ransition M~~m~~atrix and their Minimum Up Time and Minimum Down Time as defined for each~~at the~~ C~~c~~onfiguration ~~level~~.

34.6 Dispatch Instructions for Generating Units and Participating Load~~.~~

The CAISO may issue Dispatch Instructions covering:

(a) Ancillary Services;

(b) Energy, which may be used for:

(i) Congestion relief;

(ii) provision of Imbalance Energy; or

(iii) replacement of an Ancillary Service;

(c) agency operation of Generating Units, Participating Loads or Interconnection schedules, for example:

(i) output or Demand that can be Dispatched to meet Applicable Reliability Criteria;

(ii) Generating Units that can be Dispatched for Black Start;

(iii) Generating Units that can be Dispatched to maintain governor control regardless of their Energy schedules;

(d) the operation of voltage control equipment applied on Generating Units as described in this CAISO Tariff;

(e) MSS Load following instructions provided to the CAISO, which the CAISO incorporates to create their Dispatch Instructions; ~~or~~

(f) necessary to respond to a System Emergency or imminent emergency~~.~~; or

(g) Transition Instructions for Multi-Stage Generating Resources.

* * *

34.15 Rules For Real-Time Dispatch of Imbalance Energy Resources.

34.15.1 Resource Constraints.

The SCED shall enforce the following resource physical Constraints:

(a) Minimum and maximum operating resource limits. Outages and limitations due to transmission clearances shall be reflected in these limits. The more restrictive operating or regulating limit shall be used for resources providing Regulation so that the SCED shall not Dispatch them outside their Regulating Range.

(b) Forbidden Operating Regions. When ramping in the Forbidden Operating Region, the implicit ramp rate as determined from the resource's transit time will be used when Dispatching in the Forbidden Operating Region even if the Forbidden Operating Region constraint is not enforced through the SCED process.

(c) Operational Ramp Rates and Start-Up Times. The submitted Operational Ramp Rate for resources shall be used as the basis for all Dispatch Instructions, provided that the Dispatch Operating Point for resources that are providing Regulation remains within their applicable Regulating Range. The Regulating Range will limit the Ramping of Dispatch Instructions issued to resources that are providing Regulation. The Ramp Rate for Non-Dynamic System Resources cleared in the HASP will not be observed. Rather, the ramp of the Non-Dynamic System Resource will respect inter-Balancing Authority Area Ramping conventions established by WECC. Ramp Rates for Dynamic System Resources will be observed like Participating Generators in the RTD. Each Energy Bid shall be Dispatched only up to the amount of Imbalance Energy that can be provided within the Dispatch Interval based on the applicable Operational Ramp Rate. The Dispatch Instruction shall consider the relevant Start-Up Time as, if the resource is off-line, the relevant Operational Ramp Rate function, and any other resource constraints or prior commitments such as Schedule changes

across hours and previous Dispatch Instructions. The Start-Up Time shall be determined from the Start-Up Time function and when the resource was last shut down. The Start-Up Time shall not apply if the corresponding resource is on-line or expected to start.

(d) Maximum number of daily Start-Ups. The SCED shall not cause a resource to exceed its daily maximum number of Start-Ups.

(e) Minimum Run Time and Down Time. The SCED shall not start up off-line resources before their Minimum Down Time expires and shall not shut down on-line resources before their Minimum Run Time expires. For Multi-Stage Generating Resources this shall be enforced~~observed~~ both at the resource and configuration level.

(f) Operating (Spinning and Non-Spinning) Reserve. The SCED shall Dispatch Spinning and Non-Spinning Reserve subject to the limitations set forth in Section 34.16.3.

(g) Non-Dynamic System Resources. If Dispatched, each Non-Dynamic System Resource flagged for hourly pre-dispatch in the next Trading Hour shall be Dispatched to operate at a constant level over the entire Trading Hour. The HASP shall perform the hourly pre-dispatch for each Trading Hour once prior to the Operating Hour. The hourly pre-dispatch shall not subsequently be revised by the SCED and the resulting HASP Intertie Schedules are financially binding and are settled pursuant to Section 11.4.

(h) Daily Energy use limitation to the extent that Energy limitation is expressed in a resource's Bid. If the Energy Limits are violated for purposes of Exceptional Dispatches for System Reliability, the Bid will be settled as provided in Section 11.5.6.1.

34.15.2 Calculation of Dispatch Operating Points Pursuant to Start-Up and Shut-Down Instructions.

The RTED process shall calculate Dispatch Operating Points as follows:

(a) After RTUC issues a Start-Up Instruction, RTED moves the Dispatch Operating Point of a resource immediately from zero (0) MW to the PMin, as defined in the Master File or as modified via SLIC, of a Generating Unit at the start of the Dispatch Interval pertaining to the Start-Up Instruction. The Dispatch Operating Point shall then be determined using the resource's applicable Operational Ramp Rate as further described in Sections 34.15.4, 34.15.5, and 34.15.6.

(b) After RTUC issues a Shut-Down Instruction, RTED shall first ramp the Dispatch Operating Point down to the PMin, as defined in the Master File or as modified via SLIC, of a Generating Unit at the end of the Dispatch Interval pertaining to the Shut-Down Instruction, using the resource's applicable Operational Ramp Rate. The Dispatch Operating Point shall then be set immediately to zero (0) MW.

(c) For Multi-Stage Generating Resources, after RTUC issues a Transition Instruction: (1) for non-overlapping C~~c~~onfigurations ***[what is a "non-overlapping Configuration as opposed to an "overlapping Configuration"? Can this be set forth in a definition of "Configuration"?]***, the RTD moves the Dispatch Operating Point of the resource immediately from the boundary of the "from" C~~c~~onfiguration to the boundary of the "to" C~~c~~onfiguration, as defined in the Master File or as modified via SLIC, ~~of a Multi-Stage Generating Resource;~~ and (2) for over-lapping C~~c~~onfigurations, RTD moves the Dispatch Operating Point of the resource within the overlapping operating range of the C~~c~~onfiguration until the transition is complete.

* * *

39.7.1 Calculation of Default Energy Bids

Default Energy Bids shall be calculated by the CAISO, for the on-peak hours and off-peak hours for both the DAM and RTMs, pursuant to one of the methodologies described in this Section. The Scheduling Coordinator for each Generating Unit owner or Participating Load must rank order the following options of

calculating the Default Energy Bid starting with its preferred method. The Scheduling Coordinator must provide the data necessary for determining the Variable Costs unless the Negotiated Rate Option precedes the Variable Cost option in the rank order, in which case the Scheduling Coordinator must have a negotiated rate established with the Independent Entity charged with calculating the Default Energy Bid. If no rank order is specified for a Generating Unit or Participating Load, then the default rank order of (1) Variable Cost Option, (2) Negotiated Rate Option, (3) LMP Option will be applied. For the first ninety (90) days after changes to resource status and Ceonfigurations as specified in Section 27.8.3, including the first ninety (90) days after the effective date of Section 27.8.3, the Default Energy Bid option for the resource is limited to the Negotiated Rate Option or the Variable Cost Option. ***[This warrants further explanation and justification.]***

* * *

CAISO Tariff Appendix A

Master Definitions Supplement

* * *

Bid Costs	The costs for resources manifested in the Bid components submitted, which include the Start-Up Cost, Minimum Load Cost, Energy Bid Cost, Transition Costs, Pump Shut-Down Cost, Pumping Cost, Ancillary Services Bid Cost and RUC Availability Payment.

* * *

Configuration	For a Multi-Stage Generating Resource, a particular combination of generating components that are operated together, which have a distinct set of operating characteristics (e.g., maximum and minimum energy output, ramp rate, and heat rate function). ***[I know this needs work but this seems like too important a concept not to expressly define.] An over-lapping Configuration is one in which…. A non-overlapping Configuration is one in which….***

* * *

Default Resource Adequacy Path	The registered sequence of Cconfigurations that a Multi-Stage Generating Resource has to start up and transition through from off-line to reach the default Resource Adequacy configuration.

* * *

IFM Bid Cost	The sum of a BCR Eligible Resource's IFM Start-Up Cost, IFM Minimum Load Cost , IFM Pump Shut-Down Cost, IFM Transition Cost, IFM Pumping Cost, IFM Energy Bid Cost, and IFM AS Bid Cost.

* * *

Multi-Stage Generating Resources	A Generating Unit or Dynamic Resource-Specific System Resource that for reasons related to its technical characteristics can be operated in various Cconfigurations such that only one such Cconfiguration can be operated in any given Dispatch Interval. The following technical characteristics qualify a Generating Unit or Dynamic Resource-Specific System Resource as a Multi-Stage Generating Resource: 1) the resource is a combined cycle gas turbine resource; 2) the resource is a Generating Unit or Dynamic Resource-Specific System Resources with multiple operating or regulating ranges that limit the resource to operate in only one of these ranges at any given time; or 3) the resource has a Forbidden Operating Region. Metered Subsystems, Pumped-Storage Hydro Units, and Pumping Loads, and System Resources that are not Dynamic Resource-Specific System Resources do not qualify as Multi-Stage Generating Resources.

* * *

RTM Bid Cost	The total of a resource's RTM Start–Up Cost, RTM Minimum Load Cost, RTM Pump Shut-Down Cost, RTM Transition Cost, RTM Pumping Cost, RTM Energy Bid Cost, and RTM AS Bid Cost.

* * *

Transition Cost	For a Multi-Stage Generating Resources, the dollar cost per feasible

	transition associated with moving from one on-line Ceonfiguration to another.
Transition Instructions	An Dispatch Instruction instruction issued by the CAISO to Multi-Stage Generating Resources in the Real-Time that indicates: 1) "from" and "to" Ceonfigurations; and 2) the start time and end time of the transition.
Transition Matrix	For Multi-State Generating Resources defines the possible transitions between all online configurations including the Transition Times and Transition Costs.and provides additional information regarding allowable transitions between configurations, including the maximum number of allowable transitions per day.

* * *

Transition Time	For a Multi-Stage Generating Resources, the time to complete a feasible transition from one online configuration to another.

* * *

CAISO Tariff Appendix AA

Transition Plan for Multi-Stage Generating Resources

This Appendix AA describes the registration and qualification requirements for Generating Units and Dynamic Resource-Specific System Resources that intend to qualify and participate in the CAISO Markets as Multi-Stage Generating Resources as of the first day on which the Multi-Stage Generating Resource CAISO Tariff provisions are effective.

During the market simulation activities scheduled two months prior to effective date of the CAISO Tariff provisions enabling the implementation of MSG functionality, Scheduling Coordinators will be permitted to register and participate in market simulation either with or without the use of the Multi-Stage Generating Resource functionality. However, no later than seventy-five days prior to the effective date of the CAISO Tariff provisions enabling the Multi-Stage Generating Resource functionality, Scheduling Coordinators that intend to register and qualify Generating Units or Dynamic Resource-Specific System Resources as Multi-Stage Generating Resources as of the effective date of the CAISO Tariff provisions for the Multi-Stage Generating Resource functionality shall commence the registration process for the resources by

submitting to the CAISO the completed MSG registration form and the resource data template for Generating Unit or Dynamic Resource Specific System Resource, which the CAISO provides as part of the registration process. ***[Are these posted on the web site?]*** After such submission the CAISO will coordinate with the responsible Scheduling Coordinator to validate that the resource qualifies as a Multi-Stage Generating Resource, and that all the requisite information has been successfully provided to the CAISO. Successful completion of the registration process will occur upon the CAISO's notification to the responsible Scheduling Coordinator that the resource has been successfully qualified as an MSG. ***[Can SCs be assured that the CAISO will provide notice before the effective date or, if the information is not complete, that the CAISO will provide a reasonable cure period that would not delay registration?]*** Once the CAISO has provided such notice, the resource will be registered and qualified to participate as an MSG as of the effective date of the CAISO Tariff provisions enabling the implementation of the MSG functionality. Scheduling Coordinators may register the number of Multi-Stage Generating Resource Configurations as are reasonably appropriate for the unit based on the operating characteristics of the unit, which may not, however, exceed a total of ten Configurations and cannot be fewer than two Configurations. ***[Is it possible that there could be some dispute between the CAISO and the SC as to the number of Configurations that may be registered? How would such a dispute be resolved?]*** The resource will be successfully registered and qualified for the requested status and Configuration definitions on the date that the CAISO sends the notification to the responsible Scheduling Coordinator that the resource has been successfully qualified. If the CAISO determines that the resources operating and technical characteristics have changed since the time that the CAISO the notice of qualification to the responsible Scheduling Coordinator, the CAISO may request that the Scheduling Coordinator provide additional information necessary to support their registered status and if appropriate may require that the resource be registered and qualified more consistent with the resource's operating and technical characteristics.

As part of the registration process, the Scheduling Coordinators must submit to the CAISO a Transition Matrix, which contains the cost and operating constraints associated with feasible transitions between Configurations. The responsible Scheduling Coordinator shall submit for each Configuration a single segment Operational Ramp Rate, and as applicable an Operating Reserves ramp rate and Regulating

Reserves ramp rate. The Scheduling Coordinator must establish as part of the RDT in the registration the default Cconfiguration and its associated start-up path that apply to Multi-Stage Generating Resources that are subject to Resource Adequacy must-offer obligations ~~as part of the RDT in the registration~~. The Cconfigurations and operational characteristics submitted to and accepted by the CAISO during this pre-registration process will be in effect for the first sixty days after the effective date of the Multi-Stage Generating Resources CAISO Tariff provisions. Sixty days after the effective date of the Multi-Stage Generating Resources, the following modeling conversions will be possible as further described in the CAISO Tariff:

(1) Register a Generating Unit or Dynamic Resource-Specific System Resource as a Multi-Stage Generating Resource.

(2) Unregister a Generating Unit or Dynamic Resource-Specific System Resource as a Multi-Stage Generating Resource.

(3) Change the registered Cconfigurations for a Multi-Stage Generating Resource, which includes the (a) addition of new Cconfigurations; (b) removal of an existing Cconfiguration; (c) a material change to the definition of a registered Cconfiguration, which includes (i) a change in the physical units supporting the Cconfiguration, and (ii) designation of default Resource Adequacy Cconfiguration with associated default start-up path; or (d) changes of “from” and “to” Cconfigurations within their transition matrix.

When transitioning to implement these changes across the midnight hour, for any Real-Time Market run in which the changes specified in this Section 27.8.3 is to take effect within the Time Horizon of any of the Real-Time Market runs, the CAISO will Dispatch, Award, or commit resources consistent with either the prior or new status and definitions, as appropriate and required by any Real-Time conditions regardless of the resource’s state scheduled in the immediately preceding Day-Ahead Market. ***[see comments on 27.8.1].***

Resources that will be participating in the CAISO Markets as Multi-Stage Generating Resources when the CAISO Tariff Multi-Stage Generating Resource provisions become effective must submit all Outages reports required in Section 9 consistent with the registered Cconfigurations for such resources no later

than forty-eight hours prior to the start of the first hour of the effective date of the CAISO Tariff provisions enabling the implementation of the MSG functionality. _____.

* * *