California Independent
System Operator Corporation

July 31, 2009

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

RE: *California Independent System Operator Corporation*
Docket No. ER09-___-000

Tariff Clarifications Regarding Regulatory Must-Take Generation and Enforcement of Transmission Constraints

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d, and Section 35.13 of the regulations of the Federal Energy Regulatory Commission (FERC or the Commission), 18 C.F.R. § 35.13 (2007), the California Independent System Operator Corporation (CAISO or ISO) respectfully submits for filing an original and five copies of an amendment to its tariff. This amendment clarifies the tariff in two respects: (1) it ensures that generating units outside the ISO's balancing authority area can be treated as Regulatory Must-Take generation under the tariff; and (2) it clarifies certain language regarding the role of the Full Network Model (FNM) and the enforcement of transmission constraints.

The ISO is also tendering one additional copy of this filing. Please time and date stamp this copy and return to the ISO in the pre-paid and self-addressed envelope.

I. BACKGROUND

On February 9, 2006, the ISO submitted in Docket No. ER06-615 substantial changes to the then effective ISO Tarff for the purpose of implementing new Locational Marginal Price (LMP) based markets. On April 1, 2009, following a series of Commission orders, compliance filings, stakeholder processes, and further enhancements and refinements of the software requirements, the ISO implemented the new market design.

Prior to the launch of the new market, on March 23, 2009, the ISO submitted a filing in compliance with the Commission's February 19, 2009 order in Docket No. ER09-240, in which the Commission conditionally accepted certain revisions to the

ISO's tariff.[1] In addition to the amendments on compliance, the ISO submitted certain additional clarifications on issues related to the setting of the market optimization parameters. These additional clarifications pertained to (1) the ISO's proposal regarding the protection afforded to existing rights self-schedules in the day-ahead market, (2) regulatory must-take generation, and (3) the enforcement of transmission constraints. In each case, the ISO offered these additional proposed tariff amendments as clarifying in nature and related to the subject matter in that proceeding. On June 10, 2009, the Commission issued an Order on Compliance Filing[2] accepting in part and rejecting in part the ISO's proposed tariff revisions. In particular, the Commission rejected the ISO's additional revisions to its tariff as beyond the scope of compliance with the Commission's February 19, 2009 order in that proceeding.

The ISO now makes the instant tariff amendment filing to (1) implement the same tariff clarification proposed in the March 23, 2009, compliance filing regarding Regulatory Must-Take Generation and (2) clarify the tariff language regarding transmission constraints and the FNM. With respect to the regulatory must-take generation, the ISO submits the same exact change as it previously submitted, which was unopposed. With respect to enforcement of constraints and the role of the FNM, the ISO submits different language which better clarifies these provisions. As explained below, having further evaluated the affected sections of the tariff, the ISO now offers additional clarifications that better clarify the role of the FNM and the enforcement of constraints in the ISO markets.

II. TARIFF AMENDMENT

A. Regulatory Must-Take Generation

Under the ISO tariff, Regulatory Must-Take Generation generally describes those resources that the ISO must schedule in the market at a higher priority for policy reasons (*e.g.* qualifying facility output under a PURPA contract) or operational reasons (*e.g.* nuclear units that are non-dispatchable by the market) or grandfathered power purchase agreements (*i.e.* power purchase agreements in effect as of the ISO start-up) as specified in the definition of "Regulatory Must Take Generation." This term has been used in the ISO tariff since the ISO began operations. In reviewing the scheduling priority to certain Regulatory Must-Take resources in the parameter assignment process, the ISO discovered an inadvertent and unintended limitation of some legacy tariff language. Under Sections 31.4 and 34.1 of the new tariff, Regulatory Must Take Resource self-schedules are, appropriately, accorded a higher priority than other self-schedules due to their must take status. Due to an inadvertent capitalization of a term within the definition of Regulatory Must-Take-Generation, the higher priority for

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1 *California Indep. Sys. Operator Corp*, 126 FERC ¶ 61,147 (2009) ("Parameters Order").

2 *California Indep. Sys. Operator Corp*, 127 FERC ¶ 61,233 (2009) ("Order on Compliance Filing").

qualifying facilities and nuclear generating resources outside the ISO's balancing authority would not be eligible for the higher scheduling priority.

Specifically, because the defined term "Generation" is used in the definition of "Regulatory Must-Take Generation," the Regulatory Must-Take Generation status is inadvertently limited to resources inside the ISO's balancing authority area. This is because "Generation" is defined as "Energy delivered from a Generating Unit," and "Generating Unit" is defined as a resource "located within the CAISO Balancing Authority Area." Read literally, this could have the unintended consequence that certain units – such as qualifying facilities in non-ISO balancing authority areas under a PURPA contract with a public utility within the ISO balancing authority area or nuclear units that are outside of the ISO balancing authority area but under contract with load-serving entities within the ISO balancing authority area – may not qualify as Regulatory Must-Take units. The ISO has always accorded "must-take" status to existing qualifying facilities and nuclear generating resources. Removing the Regulatory Must-Take status from such units in the Master File could have the undesirable and unintended consequences in the market by changing the relative scheduling priority of these units

To avoid any unintended consequences of the term Regulatory Must Take Generation, the ISO is proposing to correct the tariff definition to make it consistent with historical practice to ensure that the definition covers all the appropriate "must take" resources. The ISO proposes simply to change the word "Generation" to "generation" in the Appendix A definition of Regulatory Must-Take Generation to ensure that the term is not inadvertently confined to internal generating units.

B. Full Network Model and Transmission Constraints

The ISO tariff contains language describing the Full Network Model and its use in the ISO markets.[3] As explained further below, however, the current tariff language does not accurately reflect the actual role the FNM plays in the ISO markets and, in particular, erroneously attributes to it certain functions related to the setting and enforcement of transmission constraints that are actually effectuated through other market mechanisms. As discussed below, the erroneous attribution of these functions to the FNM creates an appearance of inconsistency with other tariff provisions that relate to the management of transmission constraints through the clearing of the ISO markets.

Specifically, Sections 8.3.3.5 and 27.5.1 of the tariff contain the phrase: "The Full Network Model incorporates Transmission Losses and models and enforces all network

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3 The Full Network Model is a detailed mathematical representation of the physical transmission system that the CAISO operates. A detailed discussion of the Full Network Model and its role in the MRTU markets can be found in the Direct Testimony of Lorenzo Kristov, filed in Docket No. ER06-615 on February 9, 2006. The ISO has also published a Business Practice Manual for Managing the Full Network Model, which also contains considerable detail. The BPM is available here: http://www.caiso.com/17ba/17baa8bc1ce20.html.

constraints." While primarily descriptive, this phrase along with other supporting tariff provisions, require clarification on two fronts.

First, the FNM is, as the name indicates, merely a model of the transmission system. The FNM does not take any action with regard to transmission constraints. Such action is performed by the market optimization software, to which the FNM is an input, and/or by market operators, but not by the FNM itself. However, as is indicated in the quoted language above, the current tariff language erroneously suggests that the FNM actually performs the enforcement of constraints itself. In actuality, the FNM is a representation of the facilities on the grid and reflects the transmission limits and constraints but does not enforce or relax these elements.

Second, the phrase above might also be interpreted to suggest that the ISO actually enforces all transmission constraints at all times because it states that the FNM "enforces all network constraints." This is not the case. As the ISO explained in considerable detail in its submissions to FERC Docket No. ER09-240, in running the ISO markets there are occasions when certain transmission limits are relaxed in the market optimization in lieu of pursuing more costly redispatch solutions.[4] In addition, there are certain lower voltage facilities on the network whose limits the ISO does not enforce, due to lack of sufficient visibility on those constraints resulting from inadequate telemetry. Section 2.1.1.1 of the ISO's Business Practice Manual on Managing the Full Network Model, titled "Facilities that Lack Sufficient Telemetry and Visibility," describes this practice in considerable detail and the facilities it impacts.[5]

Third, the phrase quoted above states that the FNM "incorporates Transmission Losses," which is also incorrect. The FNM actually includes certain physical properties of the transmission facilities it represents, which are used by the AC power flow algorithm of the market software to calculate Transmission Losses. Again, the existing tariff language attributes to the FNM a function that it does not perform.

In order to more accurately clarify the role of the FNM and the ISO's constraint enforcement practice, the ISO proposes to make the following tariff changes:

First, the ISO proposes to revise Section 8.3.3.5 to clarify the role of the FNM in making Ancillary Services awards. The existing language erroneously suggests that the FNM plays a role in the actual procurement of Ancillary Services. That is not the case. Accordingly, the ISO is proposing revised tariff language to clarify that although the ISO

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4 *See* ISO tariff Section 27.4.3.

5 Section 2.1.1.1 of the BPM for Managing the Full Network Model states in relevant part: "Certain transmission facilities lack sufficient telemetry to provide accurate data for market dispatch and pricing purposes. Regular enforcement of constraints on these facilities in the market optimizations may lead to spurious congestion or infeasible schedules. The CAISO therefore generally does not enforce constraints on the facilities where there is not sufficient telemetry and visibility."

market optimization co-optimizes for the scheduling of Ancillary Services and Energy, Ancillary Services are actually procured based on regional requirements as already indicated in that same Section of the tariff but not as clearly.

Second, the ISO proposes to revise Section 27.5.1 to clarify the role of the FNM and to describe that, in running the CAISO Markets, the ISO will establish, enforce (or not enforce as the case may be), and manage the constraints modeled in the FNM in accordance with the considerable detail provided in the BPM for the FNM.

Third, the ISO proposes a minor modification to Sections 27.5.2 and 31.3.3 regarding the treatment of constraints within a Metered Subsystem to correct a similar inaccuracy as described above. The current language erroneously suggests that the constraints are enforced in the FNM. As discussed above, this is not the case. The ISO proposed changes to more accurately reflect that any enforcement of transmission constraints is conducted through the ISO markets.

Fourth, the ISO is proposing to revise Section 31.2.1 to clarify that only those constraints expected to be enforced in the IFM will be enforced in what is known as the "All Constraints Run" of the day-ahead market. As described in detail above and in the BPM sections referred to earlier, the ISO is proposing this change to make clear that although the ISO calls this function of the Market Power Mitigation and Reliability Requirements Determination (MPM-RRD) process of the day-ahead market the "all constraints run," not all constraints are enforced at all times. Rather, the All Constraints Run enforces whatever constraints are expected to be enforced in the applicable corresponding market run. The ISO is also proposing a corresponding change to the definition of "All Constraints Run" in Appendix A to the ISO tariff.

Fifth, the ISO is proposing a change to Section 39.7.2.2 regarding how transmission constraints will be treated in making determinations about the competitiveness of certain paths for market power mitigation purposes. The current language suggests that transmission constraints are enforced by the FNM in the determination of the competitiveness of certain paths. Similarly to the proposed changes discussed above, the ISO is proposing language to clarify that the constraints are enforced through the market runs and not by the FNM.

III. STAKEHOLDER PROCESS AND RELATED ISSUES

As discussed above, the ISO first brought the need for these tariff clarifications to the Commission's and stakeholders' attention in its parameter tuning compliance filing in Docket No. ER09-240. The Commission rejected the ISO's proposed changes as out of scope of that filing, which led to the need for the ISO to make this filing. Because the ISO has proposed in this docket changes that differ slightly from what was proposed on compliance in Docket No. ER09-240, the ISO posted these tariff changes for stakeholder review and comment on July 9, 2009. On July 21, 2009, stakeholders submitted comments.[6] On July 23, 2009, the ISO held a conference call with stakeholders to discuss the proposed tariff changes. With respect to the proposed changes to the Regulatory Must Take definition, the ISO did not seek comments for the proposed tariff change given that the ISO is proposing the same change that was previously unopposed. However, the ISO did discuss the proposed tariff change at the July 23 stakeholder meeting, and no stakeholders expressed concerns regarding this change.

With respect to the proposed changes to the FNM-related language, the ISO received two sets of comments saying that while the parties did not oppose the language specifically, they raised questions regarding the broader issue of the setting and management of transmission constraints through the ISO markets.[7] More specifically, both stakeholders requested that the ISO provide additional information regarding the constraints enforced in market runs.[8] In an effort to provide more transparency in this area of the ISO's processes, the ISO has recently (both prior to and following go-live), provided additional documentation that describes in some detail the ISO practices regarding the setting of transmission constraints, the relaxation of such constraints and the biasing practices of market operators.[9] In addition, the ISO

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6 Available at http://www.caiso.com/23e5/23e598f94d6a0.html

7 Southern California Edison also requested clarification on the reference to the IFM in Section 31.2.1. SCE requested that the ISO clarify the difference between the changes proposed for Section 31.2.1 as it relates to the changes proposed to the definition for the All Constraint Run. The ISO explained during the July 23 conference call that the reason why the proposed changes differ is because Section 31.2.1 deals only with the day-ahead market whereas the ACR definition applies to all the markets in which the ACR applies, i.e., the day-ahead and the real-time markets. Therefore, Section 31.2.1 refers to the IFM specifically whereas the definition references all the markets to which it applies. In addition, in responding to SCE's comments the ISO further clarified the proposed amendment to that language so that it is clear that the constraints enforced in the ACR are those expected to be enforced in the IFM, which is appropriate because in the day-ahead market the ACR completes the needed market power mitigation for the IFM. A similar clarification was made to the definition of ACR, the wording of which must be valid for both the day-ahead and the real-time markets.

8 Available at http://www.caiso.com/23e5/23e598f94d6a0.html.

9 *See e.g.*, Business Practice Manual for Managing the Full Network Model Section 2.1 (http://www.caiso.com/17ba/17baa8bc1ce20.html) ; (http://www.caiso.com/23ec/23ecdbac69c40.pdf); and http://www.caiso.com/23ea/23eae8aef980ex.html).

discussed these issues at great length with stakeholders at the last two meetings of the ISO's Market Surveillance Committee. The ISO understands that these efforts did not address all of the requests put forth in the recently submitted comments and recognizes the need for further dialogue on these issues.

The ISO is considering these requests more carefully. The ISO is seeking to balance the request for greater transparency to the constraint enforcement and biasing practices and the requests for specific information sought by certain market participants, against the nature, timing, and format of the data to be provided and any confidentiality and data sensitivity concerns. However, for purposes of this filing, it is important to note that stakeholder consideration of the ISO's constraint enforcement practice, changes to which are not proposed here, need not be resolved for the Commission to accept the narrow tariff clarification described above.

IV. EFFECTIVE DATE

Pursuant to Section 35.31 of the Commission's regulations, the ISO requests that the tariff sheets with proposed revisions become effective October 2, 2009, sixty days after the date of this filing.

V. COMMUNICATIONS

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list established by the Secretary with respect to this submittal:

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VI. CONTENTS OF FILING

This filing comprises:

This transmittal letter;

Attachment A: Clean Tariff Sheets

Attachment B: Blackline Tariff Sheets

VII. SERVICE

The ISO has served copies of this transmittal letter, and all attachments, on the California Public Utilities Commission, the California Energy Commission, and all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff. In addition, the CAISO is posting this transmittal letter and all attachments on the ISO website.

VIII. CONCLUSION

For the reasons set forth above, the ISO respectfully requests that the Commission accept these tariff changes and grant the requested effective date.

Respectfully submitted,

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Attachment A – Clean Sheets

Transmission Constraints Amendment Filing

Fourth Replacement CAISO Tariff

August 3, 2009

8.3.3.5 Use of the Full Network Model and Procurement of Ancillary Services.

The Full Network Model is used in the SCUC application, which optimizes the provision of Ancillary Services and Energy in order to meet Ancillary Service requirements and Energy requirements. The Full Network Model models network constraints as described in Section 27.5.1. The Ancillary Services Awards reflect the Ancillary Service Region and Sub-Region definitions and requirements. The Ancillary Service requirements, the definition of Ancillary Service Regions and Ancillary Service Sub-Regions, and any minimum or maximum limit that is used within an Ancillary Service Region or Ancillary Service Sub-Region are all inputs to the CAISO Market Processes.

8.3.4 Certification and Testing Requirements.

The owner of and Scheduling Coordinator for each Generating Unit, System Unit, Dynamic System Resource, or Participating Load for which a Bid to provide Ancillary Services or Submission to Self-Provide Ancillary Services is allowed under the CAISO Tariff, and all other System Resources that are allowed to submit a Bid to provide Ancillary Services under this CAISO Tariff, must comply with the CAISO's certification and testing requirements as contained in Appendix K and the CAISO's Operating Procedures. Each Generating Unit, Dynamic System Resource, and System Unit used to bid Regulation or used to self-provide Regulation must have been certified and tested by the CAISO using the process defined in Part A of Appendix K. Each Dynamic System Resource offering Regulation must comply with the Dynamic Scheduling Protocol in Appendix X. Spinning Reserve may be provided only from Generating Units, System Resources that submit Bids to provide Spinning Reserve from imports, or System Units, which have been certified and tested by the CAISO using the process defined in Part B of Appendix K. Non-Spinning Reserve may be provided from Curtailable Demand, on-demand rights from other entities or Balancing Authority Areas, Generating Units, System Resources that submit Bids to provide Non-Spinning Reserve from imports, or System Units, which have been certified and tested by the CAISO using the process defined in Part C of Appendix K. Voltage Support may only be provided

27.5.1 Description of FNM for CAISO Markets.

The FNM is a representation of the CAISO Balancing Authority Area that enables the CAISO to conduct power flow analyses to identify transmission Constraints for the optimization of the CAISO Markets. External Balancing Authority Areas and external transmission systems are modeled to the extent necessary to support the commercial requirements of the CAISO Markets. External connections are retained between Intertie branches within Transmission Interfaces. Certain external loops are modeled, which allows the CAISO to increase the accuracy of the Congestion Management process. Resources are modeled at the appropriate network Nodes. The pricing Location (PNode) of a Generating Unit generally coincides with the Node where the relevant revenue quality meter is connected or corrected, to reflect the point at which the Generating Units are connected to the CAISO Controlled Grid. The Dispatch, Schedule and LMP of a Generating Unit refers to a PNode, but the Energy injection is modeled in the FNM for network analysis purposes at the corresponding Generating Unit(s) (at the physical interconnection point), taking into account any losses in the transmission network leading to the point where Energy is delivered to Demand. The FNM incorporates physical characteristics needed for determining Transmission Losses and models network Constraints within the CAISO Balancing Authority Area, which are reflected in the Day-Ahead Schedules, AS Awards and RUC Awards, HASP Intertie Schedules, Dispatch Instructions and the LMPs resulting from each CAISO Markets Process. In operating the CAISO Markets, the CAISO establishes, enforces, and manages the transmission limits and Constraints associated with network facilities modeled in the FNM, as further described in the Business Practice Manuals. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the FNM separately from Transmission Losses within the CAISO

Balancing Authority Area, and does not allow such losses to determine the Marginal Cost of Losses in the LMPs that apply to the CAISO Markets. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO only enforces network Constraints that reflect limitations of the transmission facilities and Entitlements turned over to the Operational Control of the CAISO by a Participating TO, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. For the HASP, STUC, RTUC and the RTD processes, the Real-Time power flow parameters developed from the State Estimator are applied to the FNM.

27.5.2 Metered Subsystems.

The FNM includes a full model of MSS transmission networks used for power flow calculations and Congestion Management in the CAISO Markets Processes. Network Constraints (i.e. circuit ratings, thermal ratings, etc.) within the MSS, or at its boundaries, that are modeled in the FNM shall be monitored but not enforced in operation of the

CAISOMarkets. If overloads are observed in the forward markets, are internal to the MSS or at the MSS boundaries, and are attributable to MSS operations, the CAISO shall communicate such events to the Scheduling Coordinator for the MSS and coordinate any manual Re-dispatch required in Real-Time. If, independent of the CAISO, the Scheduling Coordinator for the MSS is unable to resolve Congestion internal to the MSS or at the MSS boundaries in Real-Time, the CAISO will use Exceptional Dispatch Instructions on resources that have been bid into the HASP and RTM to resolve the Congestion. The costs of such Exceptional Dispatch will be allocated to the responsible MSS Operator. Consistent with Section 4.9, the CAISO and MSS Operator shall develop specific procedures for each MSS to determine how network Constraints will be handled.

27.5.3 Integrated Balancing Authority Areas.

To the extent sufficient data are available or adequate estimates can be made for an IBAA, the FNM used by the CAISO for the CAISO Markets Processes will include a model of the IBAA's network topology. The CAISO monitors but does not enforce the network Constraints for an IBAA in running the CAISO Markets Processes. Similarly, the CAISO models the resistive component for transmission losses on an IBAA but does not allow such losses to determine LMPs that apply for pricing transactions to and from an IBAA and the CAISO Balancing Authority Area, unless allowed under a Market Efficiency Enhancement Agreement. For Bids and Schedules between the CAISO Balancing Authority Area and the IBAA, the CAISO will model the associated sources and sinks that are external to the CAISO Balancing Authority Area using individual or aggregated injections and withdrawals at locations in the FNM that allow the impact of such injections and withdrawals on the CAISO Balancing Authority Area to be reflected in the CAISO Markets Processes as accurately as possible given the information available to the CAISO.

using Demand Bids as in the IFM the MPM-RRD process optimizes resources to meet one hundred percent of the CAISO Demand Forecast and Export Bids to the extent the Export Bids are selected in the MPM-RRD process, and meet one hundred percent of Ancillary Services requirements based on Supply Bids submitted to the DAM. The pool of resources identified in the MPM-RRD process is then passed to the IFM to constitute the pool of resources available for commitment in the IFM. The CAISO performs the MPM-RRD for the DAM for the twenty-four (24) hours of the targeted Trading Day.

31.2.1 The Reliability and Market Power Mitigation Runs.

The first run of the MPM-RRD procedures is the Competitive Constraints Run (CCR), in which only limits on transmission lines pre-designated as competitive are enforced. The only RMR Units considered in the CCR are Condition 1 RMR Units that have provided market Bids for the DAM and Condition 2 RMR Units when obligated to submit a Bid pursuant to an RMR Contract. The second run is the All Constraints Run (ACR), during which all transmission Constraints that are expected to be enforced in the Integrated Forward Market are enforced. All RMR Units, Condition 1 and Condition 2, are considered in the ACR. The resources committed in the ACR form the pool of resources that is available for commitment in the IFM.

31.2.2 Bid Mitigation.

The CAISO shall compare the resource dispatch levels derived from CCR and ACR and will mitigate Bids as follows.

31.3.2 Congestion and Transmission Losses Cost Determination.

Except for those transactions exempt from such charges as specified in Section 11.2.1.5, Scheduling Coordinators will be responsible for MCC and MCL as specified in Section 27.1. The CAISO will determine the Marginal Losses surplus it has collected and will allocate such revenues to Scheduling Coordinators as described in Section 11.2.1.6.

31.3.3 Metered Subsystems.

In clearing the IFM, the CAISO will not enforce Constraints within each MSS. The Full Network Model (FNM) includes a full model of MSS transmission networks used for power flow calculations and Constraint management in the IFM and RTM. Network Constraints (i.e. circuit ratings, thermal ratings, etc.) within the MSS, or at its boundaries, that are modeled in the FNM shall be monitored but not enforced in the operation of the CAISO Markets. If overloads are observed in the forward markets that are internal to the MSS or at the MSS boundaries and are attributable to MSS operations, the CAISO shall communicate such events to the Scheduling Coordinator for the MSS and coordinate any manual Re-dispatch required in Real-Time. If, independent of the CAISO, the Scheduling Coordinator for the MSS is unable to resolve Congestion internal to the MSS or at the MSS boundaries in Real-Time, the CAISO will use Exceptional Dispatch Instructions on resources that have been bid into the HASP and RTM to resolve the Congestion. Such costs will be allocated pursuant to the provisions specified in Section 11.5.6.2.5.2. The CAISO and MSS Operator shall develop specific procedures for each MSS to determine how network Constraints will be handled. Costs associated with internal Congestion and Transmission Losses in the MSS will be the responsibility of the MSS Operator. The Scheduling Coordinator for the MSS shall be responsible for payment of Marginal Losses for transactions at any points of interconnection between the MSS and the CAISO Controlled Grid, and for the delivery of Energy to the MSS or from the MSS in accordance with the CAISO Tariff. For MSS Operators that elect Load following, the CAISO shall exclude the effect of Transmission Losses in the relevant MSS in the CAISO's calculation of loss sensitivity factors used to calculate LMPs.

assessment deems the constraint competitive. In general, a constraint may be an individual transmission line or a collection of lines that create a distinct transmission constraint. For purposes of the competitive assessment, the set of constraints that will be included in the network model are those modeled along with transmission limits expected to be enforced in clearing the CAISO Markets.

39.7.2.3 Candidate Path Identification.

The first assessment of competitive constraints will be determined prior to the effective date of this provision and will consider all interfaces to neighboring Balancing Authority Areas and all inter-zonal interfaces for zones that existed prior to the effective date of this provision to be competitive. The set of candidate constraints that will be evaluated for competitiveness in the initial assessment will be limited to intra-zonal constraints for zones that existed prior to the effective date of this provision, that were managed for Congestion in Real-Time in greater than five hundred (500) hours in the most recent twelve (12)-month period. The Congestion frequency threshold of five-hundred (500) hours for designation of competitive constraint candidates will be based on the combination of real-time intra-zonal congestion hours that pre-dated the effective date of this provision, and congestion in IFM and Real-Time markets after the effective date of this provision for the twelve (12) months of historical data. Subsequent assessments will again consider all pre-existing interfaces to neighboring Balancing Authority Areas and all inter-zonal interfaces to be competitive and will not be included in the set of candidate constraints for assessment. The set of candidate constraints will be further reduced to those remaining constraints that were congested or managed for congestion in greater than five hundred (500) hours in the prior twelve (12) months.

39.7.2.4 Feasibility Index.

The CAISO will perform a pivotal supplier test on all suppliers in the CAISO Balancing Authority Area for each path to be assessed using the Feasibility Index (FI). Suppliers will be considered in two groups: those suppliers with the largest portfolios will be considered in the preliminary simulations, and any additional suppliers who are likely to be pivotal given the competitive designations from the preliminary

Aggregated Pricing Node (Aggregated PNode)	A Load Aggregation Point, Trading Hub or any group of Pricing Nodes as defined by the CAISO.
Alert, Warning or Emergency (AWE) Notice	A CAISO operations communication issued to Market Participants and the public, under circumstances and in a form specified in CAISO Operating Procedures, when the operating requirements of the CAISO Controlled Grid are marginal because of Demand exceeding forecast, loss of major Generation sources, or loss of transmission capacity that has curtailed imports into the CAISO Balancing Authority Area, or if insufficient Bids for the Supply of Energy and Ancillary Services have been submitted in the HASP for the CAISO Balancing Authority Area.
All Constraints Run (ACR)	The second optimization run of the MPM-RRD process through which all transmission Constraints that are expected to be enforced in the market-clearing processes (IFM, RUC, STUC, RTUC and RTD) are enforced.
Ancillary Service Award or AS Award	The notification by the CAISO indicating that a Bid to supply an Ancillary Service has been selected to provide such service in the DAM, HASP, or RTM.
Ancillary Service Bid Cost or AS Bid Cost	An amount equal to the product of the AS Award from each accepted AS Bid, reduced by any applicable No Pay capacity, and the relevant AS Bid price.
Ancillary Service Bid or AS Bid	The Bid component that indicates the quantity in MW and a price in dollars per MW for a specific Ancillary Service, including Regulation Up, Regulation Down, Spinning Reserve and Non-Spinning Reserve, that a Scheduling Coordinator is offering to supply in a CAISO Market from a Generating Unit or System Resource, and only for Non-Spinning Reserve from the Load of a Participating Load.
Ancillary Service Marginal Price (ASMP)	The marginal cost of providing an Ancillary Service as further provided in Section 27.1.2.
Ancillary Service Obligation or AS Obligation	A Scheduling Coordinator's hourly obligation for Regulation Down, Regulation Up, Spinning Reserves, and Non-Spinning Reserves calculated pursuant to Section 11.10.2.1.3, 11.10.2.2.2, 11.10.3.2, and 11.10.4.2, respectively.

Attachment B - Blacklines

Transmission Constraints Amendment Filing

Fourth Replacement CAISO Tariff

August 3, 2009

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8.3.3.5 Use of the Full Network Model and Procurement of Ancillary Services.

The Full Network Model ~~and~~ is used in the SCUC application, which optimizes the provision of Ancillary Services and Energy in order to meet Ancillary Service requirements and Energy requirements. The Full Network Model ~~incorporates Transmission Losses and~~ models ~~and enforces all~~ network constraints as described in Section 27.5.1.~~, which are reflected in~~ tThe Ancillary Services Awards reflect the Ancillary Service Region and Sub-Region definitions and requirements ~~as well as the other results from each of the CAISO Market Processes~~. The Ancillary Service requirements, the definition of Ancillary Service Regions and Ancillary Service Sub-Regions, and any minimum or maximum limit that is used within an Ancillary Service Region or Ancillary Service Sub-Region are all inputs to ~~the Full Network Model and are incorporated into~~ the CAISO Market Processes.

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27.5.1 Description of FNM for CAISO Markets.

The FNM is a representation of the CAISO Balancing Authority Area that enables the CAISO to conduct power flow analyses to identify transmission Constraints for the optimization of the CAISO Markets. External Balancing Authority Areas and external transmission systems are modeled to the extent necessary to support the commercial requirements of the CAISO Markets. External connections are retained between Intertie branches within Transmission Interfaces. Certain external loops are modeled, which allows the CAISO to increase the accuracy of the Congestion Management process. Resources are modeled at the appropriate network Nodes. The pricing Location (PNode) of a Generating Unit generally coincides with the Node where the relevant revenue quality meter is connected or corrected, to reflect the point at which the Generating Units are connected to the CAISO Controlled Grid. The Dispatch, Schedule and LMP of a Generating Unit refers to a PNode, but the Energy injection is modeled in the FNM for network analysis purposes at the corresponding Generating Unit(s) (at the physical interconnection point), taking into account any losses in the transmission network leading to the point where Energy is delivered to Demand. ~~For the CAISO Markets Processes, t~~The FNM incorporates physical characteristics needed for determining Transmission Losses and models ~~and enforces all~~ network Constraints within the CAISO Balancing Authority Area, which are reflected in the Day-Ahead

Schedules, AS Awards and RUC Awards, HASP Intertie Schedules, Dispatch Instructions and the LMPs resulting from each CAISO Markets Process. In operating the CAISO Markets, the CAISO establishes, enforces, and manages the transmission limits and Constraints associated with network facilities modeled in the FNM, as further described in the Business Practice Manuals. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the FNM separately from Transmission Losses within the CAISO Balancing Authority Area, and does not allow such losses to determine the Marginal Cost of Losses in the LMPs that apply to the CAISO Markets. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO only enforces network Constraints that reflect limitations of the transmission facilities and Entitlements turned over to the Operational Control of the CAISO by a Participating TO, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. For the HASP, STUC, RTUC and the RTD processes, the Real-Time power flow parameters developed from the State Estimator are applied to the FNM.

27.5.2 Metered Subsystems.

The FNM includes a full model of MSS transmission networks used for power flow calculations and Congestion Management in the CAISO Markets Processes. Network Constraints (i.e. circuit ratings, thermal ratings, etc.) within the MSS, or at ~~the~~ its boundaries, that are modeled in the FNM shall be monitored but not enforced in operation of the CAISO~~'s FNM~~ Markets. If overloads are observed in the forward markets, are internal to the MSS or at the MSS boundaries, and are attributable to MSS operations, the CAISO shall communicate such events to the Scheduling Coordinator for the MSS and coordinate any manual Re-dispatch required in Real-Time. If, independent of the CAISO, the Scheduling Coordinator for the MSS is unable to resolve Congestion internal to the MSS or at the MSS boundaries in Real-Time, the CAISO will use Exceptional Dispatch Instructions on resources that have been bid into the HASP and RTM to resolve the Congestion. The costs of such Exceptional Dispatch will be allocated to the responsible MSS Operator. Consistent with Section 4.9, the CAISO and MSS Operator shall develop specific procedures for each MSS to determine how network Constraints will be handled.

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31.2.1 The Reliability and Market Power Mitigation Runs.

The first run of the MPM-RRD procedures is the Competitive Constraints Run (CCR), in which only limits on transmission lines pre-designated as competitive are enforced. The only RMR Units considered in the CCR are Condition 1 RMR Units that have provided market Bids for the DAM and Condition 2 RMR Units when obligated to submit a Bid pursuant to an RMR Contract. The second run is the All Constraints Run (ACR), during which all transmission Constraints that are expected to be enforced in the Integrated Forward Market are enforced. All RMR Units, Condition 1 and Condition 2, are considered in the ACR. The resources committed in the ACR form the pool of resources that is available for commitment in the IFM.

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31.3.3 Metered Subsystems.

In clearing the IFM, the CAISO will not enforce Constraints within each MSS. The Full Network Model (FNM) includes a full model of MSS transmission networks used for power flow calculations and Constraint management in the IFM and RTM. Network Constraints (i.e. circuit ratings, thermal ratings, etc.) within the MSS, or at its boundaries, that are modeled in the FNM shall be monitored but not enforced in the operation of the CAISO~~'s FNM~~Markets. If overloads are observed in the forward markets that are internal to the MSS or at the MSS boundaries and are attributable to MSS operations, the CAISO shall communicate such events to the Scheduling Coordinator for the MSS and coordinate any manual Re-dispatch required in Real-Time. If, independent of the CAISO, the Scheduling Coordinator for the MSS is unable to resolve Congestion internal to the MSS or at the MSS boundaries in Real-Time, the CAISO will use Exceptional Dispatch Instructions on resources that have been bid into the HASP and RTM to resolve the Congestion. Such costs will be allocated pursuant to the provisions specified in Section 11.5.6.2.5.2. The CAISO and MSS Operator shall develop specific procedures for each MSS to determine how network Constraints will be handled. Costs associated with internal Congestion and Transmission Losses in the MSS will be the responsibility of the MSS Operator. The Scheduling Coordinator for the MSS shall be responsible for payment of Marginal Losses for transactions at any points of interconnection between the MSS and the CAISO Controlled Grid, and for the delivery of Energy to the MSS or from the MSS in accordance with the CAISO Tariff. For MSS Operators that elect Load

following, the CAISO shall exclude the effect of Transmission Losses in the relevant MSS in the CAISO's calculation of loss sensitivity factors used to calculate LMPs.

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39.7.2.2 Criteria.

A transmission constraint will be deemed competitive if no three unaffiliated suppliers are jointly pivotal in relieving congestion on that constraint. The determination of whether or not the pivotal supplier criteria for an individual constraint are violated will be assessed using the Feasibility Index described in Section 39.7.2.4. Assessment of competitiveness will be performed assuming various system conditions potentially including but not limited to season, load, planned transmission and resource outages. If an individual constraint fails the pivotal supplier criteria under any of these system conditions, the constraint will be deemed uncompetitive for the entire year under all system conditions until a subsequent assessment deems the constraint competitive. In general, a constraint may be an individual transmission line or a collection of lines that create a distinct transmission constraint. For purposes of the competitive assessment, the set of constraints that will be included in the network model are those modeled along with transmission limits expected to be enforced ~~in the FNM used~~ in clearing the CAISO Markets.

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CAISO Tariff Appendix A

Master Definitions Supplement

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All Constraints Run (ACR)	The second optimization run of the MPM-RRD process through which all ~~known~~ transmission Constraints that are expected to be enforced in the market-clearing processes (IFM, RUC, STUC, RTUC and RTD) are enforced.

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Regulatory Must-Take Generation	Those ~~G~~generation resources identified by CPUC, or a Local Regulatory Authority, the operation of which is not subject to competition. These resources will be scheduled by the relevant Scheduling Coordinator directly with the CAISO on a must-take basis. Regulatory Must-Take Generation includes ~~G~~generation from Qualifying Facility Generating Units subject to a mandatory purchase obligation as defined by federal

law, nuclear units and pre-existing power purchase contracts with minimum Energy take requirements.

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Reliability Coordinator	The entity designated by WECC as responsible for reliability coordination in Real-Time for the area defined by WECC.
Reliability Criteria	Pre-established criteria that are to be followed in order to maintain desired performance of the CAISO Controlled Grid under Contingency or steady state conditions.
Reliability Must-Run Charge (RMR Charge)	The sum payable by a Responsible Utility to the CAISO pursuant to Section 41 for the costs, net of all applicable credits, incurred under the Reliability Must-Run Contract.
Reliability Must-Run Contract (RMR Contract)	A Must-Run Service Agreement between the owner of a Reliability Must-Run Unit and the CAISO.
Reliability Must-Run Generation (RMR Generation)	Generation that the CAISO determines is required to be on line to meet Applicable Reliability Criteria requirements. This includes i) Generation constrained on line to meet NERC and WECC reliability criteria for interconnected systems operation; ii) Generation needed to meet Load demand in constrained areas; and iii) Generation needed to be operated to provide voltage or security support of the CAISO or a local area.
Reliability Must-Run Unit (RMR Unit)	A Generating Unit of a Participating Generator which is the subject of a Reliability Must-Run Contract.