



July 29, 2011

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. ER11-\_\_\_\_\_ -000  
Tariff Amendment to Modify Tariff Provisions  
Regarding Dynamic Transfers**

Dear Secretary Bose:

The California Independent System Operator Corporation (ISO) submits this filing to modify the provisions in the ISO tariff regarding dynamic transfers of energy and ancillary services into and out of the ISO balancing authority area.<sup>1</sup> This dynamic transfers tariff amendment is intended to: (i) expand upon and clarify the existing ISO tariff provisions governing dynamic scheduling of imports into the ISO balancing authority area, (ii) incorporate provisions into the tariff to facilitate potential dynamic scheduling of exports of energy from generating units in the ISO balancing authority area to other balancing authority areas, and (iii) incorporate provisions into the tariff to implement the ability of generators inside and outside the ISO balancing authority area to engage in dynamic transfers to and out of the ISO balancing authority area through a mechanism known as “pseudo-ties.”<sup>2</sup>

These tariff modifications regarding dynamic transfers build upon existing tariff provisions and upon provisions in pilot agreements between the ISO and

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<sup>1</sup> The ISO submits this filing pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d, and Section 35.13 of the Commission’s regulations, 18 C.F.R. § 35.13. The ISO is also sometimes referred to as the CAISO. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the ISO tariff and in this dynamic transfers tariff amendment, and except where otherwise noted herein, references to section numbers are references to sections of the tariff.

<sup>2</sup> In addition, this filing includes proposed clarifications and corrections regarding several other related matters as discussed below.

market participants that the Commission accepted for filing in earlier proceedings. The proposed modifications are just and reasonable because they enhance the ability of resources, particularly intermittent resources utilizing renewable energy sources, to participate in and serve electricity markets throughout the western interconnection, thereby improving the efficiency and operation of those markets, while at the same time ensuring the continued reliability of the grid.

The ISO requests that the Commission make the tariff revisions contained in this filing effective as of November 1, 2011. The ISO also requests that the Commission issue an order on the tariff revisions by October 1, 2011. Issuance of a Commission order by October 1 will give the ISO sufficient time to work with owners and scheduling coordinators for resources that wish to engage in dynamic transfers to implement an orderly transition of existing resources to these new tariff provisions and to make the functionality provided by these new tariff provisions available to new resources.

## **I. Background**

Dynamic transfer is the transfer of energy or ancillary services from resources interconnected in one balancing authority area into another balancing authority area pursuant to a dynamic signal processed in the balancing authorities' energy management systems.<sup>3</sup>

There are two basic categories of dynamic transfers: dynamic schedules and pseudo-ties. A dynamic schedule is a dynamic transfer in which the resource supplying the energy or ancillary services remains under the control of the balancing authority – called the host balancing authority – for the balancing authority area where the resource is interconnected to the electric system. Under a dynamic schedule, the host balancing authority includes the resource's output in its balancing of supply and demand. A pseudo-tie is a dynamic transfer in which the resource supplying the energy or ancillary services is accounted for in the balancing of supply and demand by the balancing authority for the balancing authority area – called the attaining balancing authority area – into which the energy or ancillary services are delivered, and the attaining balancing authority also performs other balancing authority functions for the resource, even though the resource is interconnected to the electric system within another balancing authority area – called its native balancing authority area.<sup>4</sup>

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<sup>3</sup> Thus, by definition a dynamic transfer must cross an intertie between balancing authority areas. A dynamic transfer cannot both originate and be delivered within the ISO balancing authority area (or any other balancing authority area).

<sup>4</sup> The features and characteristics of dynamic transfers, dynamic schedules, and pseudo-ties are explained in greater detail in Appendix A to the ISO's dynamic transfer straw proposal

Currently, the ISO tariff includes provisions that permit dynamic scheduling of imports from system resources (*i.e.*, resources located outside the ISO balancing authority area) that satisfy the applicable requirements, but it does not include provisions regarding dynamic scheduling of exports from resources within the ISO balancing authority area to other (external) balancing authority areas.<sup>5</sup> The ISO has also filed and received Commission acceptance of several pilot agreements separately negotiated between the ISO and market participants to permit dynamic transfers into or out of the ISO balancing authority area using pseudo-ties,<sup>6</sup> but the tariff does not include language making such pseudo-tie arrangements available to market participants on a more general basis. As the performance of these pilot pseudo-tie arrangements has thus far been satisfactory, and the ISO has determined that it can support dynamic scheduling of exports based on the successful operation of dynamic scheduling of imports, the ISO has determined that modifying its existing tariff provisions regarding dynamic scheduling and implementing the ability of resources to engage in dynamic transfers through pseudo-ties would be beneficial to California electricity markets as well as markets throughout the western interconnection.

Enhancement of the ISO's existing dynamic transfer provisions will serve several purposes. For one thing, doing so will expand the dynamic transfer options available to market participants, thus augmenting the ability of market participants to participate in the ISO's markets. This may make the markets more competitive thereby exerting a positive impact on prices for energy and ancillary services, which will ultimately benefit consumers.

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(Mar. 10, 2010), available on the ISO's website at <http://www.caiso.com/2755/2755e7b852d20.pdf>.

<sup>5</sup> The existing tariff provisions regarding dynamic scheduling of imports include language in the body of the ISO tariff, a *pro forma* dynamic scheduling agreement for scheduling coordinators set forth in Appendix B.5 to the tariff, a *pro forma* dynamic scheduling host balancing authority operating agreement set forth in Appendix B.9 to the tariff, the dynamic scheduling protocol currently set forth in Appendix X to the tariff, and related defined terms set forth in Appendix A to the tariff. An entity may engage in dynamic scheduling only if the relevant agreements with the ISO are executed and the relevant testing, certification, and other requirements referenced in the dynamic scheduling tariff provisions are satisfied.

<sup>6</sup> See filing of pseudo participating generator agreement between the ISO and Calpine Construction Finance Company, L.P., Docket No. ER06-58-001 (Jan. 17, 2006); Commission letter order, Docket No. ER06-58-001 (Mar. 1, 2006) (order accepting agreement); filing of pilot pseudo tie implementation agreement among the ISO, Pacific Gas and Electric Company, Sacramento Municipal Utility District, and Western Area Power Administration, Docket No. ER06-1470-000 (Sept. 6, 2006) (order accepting agreement); Commission letter order, Docket No. ER06-1470-000 (Oct. 23, 2006); filing of pseudo participating generator agreement with El Dorado Energy, LLC, Docket No. ER10-342-000 (Nov. 30, 2009); Commission letter order, Docket No. ER10-342-000 (Jan. 8, 2010) (order accepting agreement).

Enhancement of the existing dynamic transfer capability will provide more opportunity and remove barriers to meeting the requirements of California's legislation establishing renewable energy portfolio standards and will satisfy the requests of market participants for enhancement of that capability. Pursuant to the renewable energy portfolio standards legislation, electric corporations in California were required to increase procurement from renewable (also sometimes called intermittent) energy resources by at least 1 percent of their retail sales annually, until they reached 20 percent by the end of 2010.<sup>7</sup> Further, in 2008 and 2009, the Governor of California issued executive orders that set a target for renewable energy resources to supply 33 percent of the power to California by 2020.<sup>8</sup> The 33 percent by 2020 target was made a legal requirement in 2011.<sup>9</sup> Pursuant to the enactment of that legislation, "[e]ligible renewable energy resource electricity products that . . . [h]ave an agreement to dynamically transfer electricity to a California balancing authority" count toward meeting the 33 percent standard.<sup>10</sup>

With the advent of the 20 and 33 percent renewable energy portfolio standards, the frequency of requests to the ISO for import services into the ISO using dynamic scheduling has increased dramatically. In recent years, multiple independent power project developers of external conventional and renewable generation resources have inquired with the ISO about participation in various ISO markets and renewable energy programs. For example, in comments submitted in the stakeholder process for this dynamic transfers tariff amendment, Pacific Gas and Electric Company (PG&E) stated that dynamic transfer is essential for incorporating renewable resources outside the ISO's balancing authority area into PG&E's resource portfolio, and the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California stated that they have already contracted outside the ISO balancing authority area but cannot get power to their cities due to the current ISO tariff provisions and procedures.<sup>11</sup>

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<sup>7</sup> See report of the California Public Utilities Commission (CPUC) entitled *Renewables Portfolio Standard Quarterly Report – Q4 2010*, at 1. This report is available on the CPUC's website at <http://www.cpuc.ca.gov/NR/rdonlyres/CFD76016-3E28-44B0-8427-3FAB1AA27FF4/0/FourthQuarter2010RPSReporttotheLegislature.pdf>.

<sup>8</sup> See *id.*, referring to Executive Orders S-14-08 and S-21-09.

<sup>9</sup> See <http://www.energy.ca.gov/renewables/>.

<sup>10</sup> California Senate Bill X1-2, Section 22, available at [http://info.sen.ca.gov/pub/11-12/bill/sen/sb\\_0001-0050/sbx1\\_2\\_bill\\_20110201\\_introduced.html](http://info.sen.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_bill_20110201_introduced.html).

<sup>11</sup> See the ISO's dynamic transfers final proposal (May 2, 2011) at 4. The dynamic transfers final proposal, which is discussed throughout this filing, is provided in Attachment D to the filing and is available on the ISO's website at <http://www.caiso.com/2b72/2b72e3f642fa0.pdf>. A mapping table showing how the provisions of the dynamic transfers final proposal have been implemented by specific tariff changes is provided in Attachment E to this filing and is available on the ISO's website at <http://www.caiso.com/2bb4/2bb4be5549c90.pdf>.

Moreover, the policies of the North American Electric Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC) do not currently address the implementation of dynamic transfers for renewable resources. Various efforts are underway within WECC to consider how to implement, operate, and account for the coordinated interchange of intermittent energy from source to sink balancing authority areas. Also, the use of dynamic transfer functionality to establish pseudo-ties available to provide supply in markets is a relatively new and rarely used concept in the west.<sup>12</sup> The ISO believes it well serves market participants to be at the forefront of the efforts to enhance the existing dynamic transfer capability.

The ISO initiated the stakeholder process for this dynamic transfers tariff amendment in November 2009. As part of the stakeholder process, the ISO also had discussions with representatives of neighboring balancing authority areas in the western interconnection, in addition to presenting briefings to WECC subcommittees and participating in discussions of the “Joint Initiatives” (including the dynamic scheduling system) among balancing authorities and market participants in the WECC region, to ensure that the ISO’s dynamic transfers tariff amendment is consistent with their own dynamic transfer initiatives.<sup>13</sup> During the policy development process, the ISO, in consultation with General Electric (GE Energy), performed a study to determine if there are any technical limitations on the amount of dynamic transfers of intermittent resources that need to be established other than the intertie transfer capability itself.<sup>14</sup> The ISO’s technical studies have concluded that no dynamic transfer capability limits need to be applied at this time to dynamic transfers of intermittent resources to the ISO’s balancing authority area. Other balancing authorities may determine that they need to impose limitations on dynamic transfers based on impacts in their balancing authority areas.

The stakeholder process has provided extensive opportunities for stakeholder participation over the course of the past year and a half, including a total of 15 meetings and conference calls and 15 additional opportunities for written stakeholder comments, in addition to the opportunity for stakeholders to provide comments directly to the ISO’s market surveillance committee regarding particular aspects of the proposed revisions and to the ISO’s governing board

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<sup>12</sup> Dynamic transfers final proposal at 4.

<sup>13</sup> See *id.* at 8, 29-30, 37-38.

<sup>14</sup> See the final report of GE Energy regarding the study, which was posted on the ISO’s website at <http://www.caiso.com/Documents/FinalReport-Impact-DynamicSchedulesonInterfaces-PreparedbyGE.pdf>.

regarding the proposal in general.<sup>15</sup> The ISO issued the dynamic transfers final proposal on May 2, 2011, and the final proposal was presented to and approved by the ISO governing board on May 19, 2011.<sup>16</sup>

The ISO greatly appreciates the extensive input provided by stakeholders and representatives of neighboring balancing authority areas throughout the process. Their input has enabled the ISO to prepare a tariff amendment that it believes represents a broad consensus among stakeholders regarding how the existing dynamic transfer capability should be enhanced, and that is consistent with the dynamic transfer initiatives of the other balancing authority areas.<sup>17</sup>

## **II. Proposed Tariff Modifications**

### **A. Overview**

In this section, the ISO discusses in detail the tariff modifications proposed in this filing. The tariff modifications encompass four possible types of dynamic transfer transactions: (1) dynamic schedules of imports from system resources into the ISO balancing authority area, (2) dynamic schedules of exports from generating resources located in the ISO balancing authority area, (3) pseudo-ties of generating resources interconnected within another balancing authority area that have the ISO as their attaining balancing authority area (*i.e.*, pseudo-ties to the ISO balancing authority area), and (4) pseudo-ties of generating resources interconnected within the ISO balancing authority area that have a different attaining balancing authority area (*i.e.*, pseudo-ties out of the ISO balancing authority area). Except as required to reflect differences between dynamic transfers and internal scheduled resources, dynamic schedules of imports and pseudo-ties to the ISO balancing authority area will be treated comparably to generating units internal to the ISO that provide energy and ancillary services within the ISO balancing authority area, and dynamic schedules of exports and

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<sup>15</sup> A list of key dates in the ISO stakeholder process for the dynamic transfers tariff amendment is provided in Attachment F to this filing. Materials related to the stakeholder process are available on the ISO's website at <http://www.caiso.com/informed/Pages/StakeholderProcesses/DynamicTransfers.aspx>.

<sup>16</sup> Materials related to the governing board's approval are provided in Attachment G to this filing and are available on the ISO's website at <http://www.caiso.com/informed/Pages/BoardCommittees/BoardGovernorsMeetings.aspx>.

<sup>17</sup> To the extent that new dynamic transfers use the same functionality that supports the existing dynamic transfers, the ISO will be able to support the new dynamic transfers under the existing ISO tariff or after the tariff revisions contained in this filing go into effect. In instances where the ISO needs to modify its existing market or operations systems to support new dynamic transfers, the ISO will use interim functionality until the needed system enhancements can be implemented, as further explained in Section III of this transmittal letter.

pseudo-ties out of the ISO balancing authority area will be treated comparably to non-dynamic transfers of energy and ancillary services out of the ISO.

The ISO first discusses the tariff revisions applicable solely to dynamic schedules. These revisions include tariff changes to implement dynamic scheduling of exports that are similar to (*i.e.*, are essentially the converse of) existing tariff provisions regarding dynamic scheduling of imports, and to include more general references to applicable agreements and balancing authorities. The ISO also proposes to modify the dynamic scheduling agreement for scheduling coordinators, the dynamic scheduling host balancing authority operating agreement, and the dynamic scheduling protocol to include provisions regarding dynamic scheduling of exports and make certain modifications to the provisions for dynamic scheduling of imports. Further, the ISO proposes to move the dynamic scheduling protocol from Appendix X to the tariff to Appendix M, so that it is located immediately before the new pseudo-tie protocol the ISO proposes to include in Appendix N to the tariff.

The ISO then addresses the tariff revisions applicable solely to pseudo-ties. These tariff modifications applicable solely to pseudo-ties include new and modified defined terms to incorporate provisions regarding pseudo-ties, modifications to the body of the tariff to add general provisions for pseudo-ties of generating resources to and out of the ISO balancing authority area and to clarify the treatment of pseudo-ties of generating resources to the ISO balancing authority area for purposes of particular provisions, the addition of the *new pro forma* pseudo-tie participating generator agreement to Appendix B.16 to the tariff, and the addition to the tariff of a new pseudo-tie protocol as Appendix N to the tariff. The provisions of the pseudo-tie participating generator agreement and pseudo-tie protocol include modified and enhanced versions of provisions that the Commission has already accepted in the ISO's previous filing of pilot pseudo-tie participating generator agreements.

Next the ISO addresses its proposed tariff modifications applicable to both dynamic schedules and pseudo-ties. These modifications concern a number of proposed changes to the tariff, including changes to the existing tariff provisions regarding market modeling, pricing, and settlement and regarding intermittent resources in order to reflect new provisions relating to dynamic schedules and pseudo-ties, as well as provisions permitting the ISO to impose a moratorium on new dynamic transfers if necessary.

The ISO also addresses several more general revisions, as well as minor miscellaneous clarifications and corrections proposed in this dynamic transfers tariff amendment.

A table listing each of these proposed tariff revisions and the sections of this transmittal letter in which the ISO explains the reasons for the tariff revisions is provided in Attachment C to this filing.

## **B. Tariff Modifications Applicable Solely to Dynamic Schedules**

### **1. Modifications to the General Tariff Provisions Regarding Dynamic Schedules of Imports and Exports**

Section 4.5.4.3 of the current ISO tariff specifies the general scope of the dynamic scheduling of imports of energy and ancillary services into the ISO balancing authority area and provides references to the more detailed provisions of the tariff regarding this subject. The ISO proposes to modify Section 4.5.4.3 to make minor clarifications to the references to the agreements needed with other balancing authorities and to include similar general tariff provisions regarding dynamic scheduling of exports of energy out of the ISO balancing authority area.<sup>18</sup> The ISO has broken out the section numbering of Section 4.5.4.3 to include Section 4.5.4.3.1, which concerns dynamic scheduling of imports, and new Section 4.5.4.3.2, which concerns dynamic scheduling of exports. These changes serve to implement the functionality, requested by a number of stakeholders, to allow resources within the ISO to engage in dynamic scheduling of energy exports from generating resources within the ISO's balancing authority area.

Section 4.5.4.3.2 includes provisions that largely parallel those in Section 4.5.4.3.1. Section 4.5.4.3.2 states that scheduling coordinators may submit bids for dynamic schedules of exports of energy from generating units located in the ISO balancing authority area, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards and any requirements of the Nuclear Regulatory Commission, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the dynamic scheduling protocol in Appendix M to the tariff or posted in standards on the ISO website, are satisfied, (c) the scheduling coordinator for the generating unit executes a dynamic scheduling agreement for scheduling coordinators as provided in Appendix B.5 to the tariff with the ISO for the operation of dynamic scheduling functionality, and (d) all affected balancing authorities each execute with the ISO an operating agreement particular to the operation of dynamic scheduling functionality.

Section 4.5.4.3.2 also specifies limitations on the proposed expansion of dynamic scheduling functionality to include dynamic scheduling of exports that the ISO considers necessary based on tariff and systems constraints.

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<sup>18</sup> The ISO does not propose to allow dynamic schedules of exports of ancillary services out of the ISO balancing authority area.



Scheduling coordinators may not submit bids for dynamic schedules of exports of ancillary services from resources located in the ISO balancing authority area, as the ISO tariff does not currently support exports of ancillary services under any circumstances. This would require a separate policy initiative. Nor may scheduling coordinators submit bids for dynamic schedules of exports from loads located in the ISO balancing authority area. The ISO anticipates that any extension of dynamic exports functionality to loads would involve unanticipated complications beyond those the ISO has encountered with existing functionality. The ISO is not in a position to commit to implementation of this functionality in its tariff without first testing the feasibility of such functionality through a pilot. An additional constraint on the implementation of dynamic export functionality even for generation is that the ISO has not had the opportunity to conduct a pilot to determine exactly what software programming and process changes may be needed. The potential need for additional functionality or processes, at least for the first proposal for a dynamic export, is described further in Section III of this transmittal letter.

## **2. Modifications to Include More General References to Applicable Agreements and Balancing Authorities**

The ISO envisions that Commission acceptance of the tariff changes proposed in this dynamic transfers tariff amendment will result in all future dynamic transfer arrangements with the ISO being governed by the ISO tariff as amended by this filing. In the past the ISO has attempted to address arrangements for dynamic schedules of imports, including regulation service, in provisions of its interconnected balancing authority area operating agreements with other balancing authorities, for which the ISO had developed a *pro forma* agreement. However, with the acceptance of this tariff amendment, the ISO does not plan to require the use of such *pro forma* agreements in the future.<sup>19</sup> Therefore, the ISO proposes to modify Section 4.5.4.3.1 of the ISO tariff, the *pro forma* dynamic scheduling host balancing authority operating agreement set forth in Appendix B.9 to the tariff, and the dynamic scheduling protocol set forth in Appendix M (formerly Appendix X) to the tariff to delete overly specific references to host balancing authorities, intermediary balancing authorities, and an interconnected balancing authority area operating agreement, in order to permit the tariff language to be flexible enough to accommodate the particular interests and preferences for forms of operating agreements of the variety of other balancing authorities with which the ISO anticipates it will need to negotiate to implement these proposed dynamic transfers functionalities on a case-by-case basis.

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<sup>19</sup> An interconnected balancing authority area operating agreement is defined in Appendix A to the ISO tariff as an “agreement entered into between the CAISO and a Balancing Authority of a Balancing Authority Area interconnected to the CAISO Balancing Authority Area to govern operation of their interconnected electric systems.”

The ISO has also proposed minor clarifications to Section 8.3.7.2, regarding requirements for imports of regulation. The proposed clarifications would (1) add use of the defined terms host balancing authority and host balancing authority area, which terms were added to the ISO tariff after this section was originally written, (2) make the reference to the requirement of an operating agreement generic in order to encompass any such agreement that the ISO and the host balancing authority determine is appropriate, and (3) clarify that the ISO certifies the scheduling coordinator, and not the host balancing authority, for its ability to provide imports of regulation service, recognizing that the scheduling coordinator will need the cooperation of the host balancing authority to demonstrate the ability to dynamically adjust interchange schedules based on ISO control signals.

### **3. Modifications to the Dynamic Scheduling Agreement for Scheduling Coordinators**

As noted above, the ISO is proposing to implement in this amendment functionality to allow the dynamic scheduling of exports.<sup>20</sup> Consistent with that proposal, the ISO has modified Sections 4.1.2, 4.1.4, 4.1.5, 4.1.6, and 6.1 of the *pro forma* dynamic scheduling agreement for scheduling coordinators set forth in Appendix B.5 to the tariff to apply to generating resources from which a scheduling coordinator intends to dynamically schedule exports and that are set forth in Schedule 1 to the agreement. The ISO has also modified Schedule 1 of the dynamic scheduling agreement for scheduling coordinators to include placeholders for descriptions of the applicable generating resources, including associated power plants and maximum power values, associated inertia, and affected balancing authority areas for dynamic exports from the ISO balancing authority area in addition to the similar existing provisions for dynamic imports to the ISO balancing authority area.

In the dynamic transfers final proposal, the ISO proposed to eliminate the tolerance band approach set forth in Section 5.1 of the dynamic scheduling agreement for scheduling coordinators as a means of measuring compliance with ISO requirements for reliable operations. The ISO explained the difficulty of making the tolerance band approach workable under the existing approach in the agreement of exposure to potential contract termination after three events of noncompliance and observed that enforcement of the requirement to comply with the ISO's operating orders would be a more effective means of ensuring compliance with applicable operating requirements.<sup>21</sup> The ISO also stated that it would propose alternatives to contract termination, including contract

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<sup>20</sup> Dynamic transfers final proposal at 3, 33-35.

<sup>21</sup> *Id.* at 21-26.

suspension, as a means of ensuring compliance with the ISO's operating requirements.<sup>22</sup>

Pursuant to that proposal, the ISO has modified Section 5.1 of the dynamic scheduling agreement for scheduling coordinators to delete its provisions regarding the tolerance band approach to measuring compliance. In conjunction with the elimination of that existing approach to ensuring compliance, the ISO has modified Section 3.2.2 of the same agreement to state that the ISO will have the right to suspend (in addition to the existing right to terminate) the agreement after three instances of non-compliance with the provisions of the dynamic scheduling protocol. The ISO considers this right to suspend the agreement to provide it sufficient latitude to employ any of the proposed remedies for noncompliance discussed in the dynamic transfers final proposal that might be effective to relieve the noncompliance. The ISO also retains in Section 1.5.7 of Appendix M (formerly Appendix X) to the ISO tariff the obligation to comply with the ISO's operating orders, which carries with it the enforcement provisions of the ISO tariff applicable to failure to comply with ISO operating orders.

In addition, the ISO has modified Section 4.2 of the dynamic scheduling agreement for scheduling coordinators to cross-reference the dynamic scheduling protocol set forth in Appendix M (formerly Appendix X) to the ISO tariff. The ISO has also modified the agreement to correct minor typographical errors and to update the address listed for the ISO.

As explained in the dynamic transfers final proposal, the ISO reviews requests to enter into a dynamic scheduling agreement for scheduling coordinators on a case-by-case basis. The ISO permits such agreements in cases where performance terms and conditions, supported by successful management of inadvertent energy and sufficient contingency reserves, indicate that the subject resources will reliably perform as dynamic schedules. The ISO will use the same criteria to evaluate requests by single-generator balancing authority areas to enter into dynamic scheduling agreements for scheduling coordinators.<sup>23</sup> Therefore, no tariff revisions are required to permit single-generator balancing authority areas to take part in dynamic scheduling.

#### **4. Modifications to the Dynamic Scheduling Host Balancing Authority Operating Agreement**

The ISO proposes one significant revision and some other minor modifications to the *pro forma* dynamic scheduling host balancing authority

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<sup>22</sup> *Id.* at 26.

<sup>23</sup> *Id.* at 8, 33.

operating agreement set forth in Appendix B.9 to the ISO tariff. Most significantly, the ISO is proposing to incorporate into the agreement a *pro rata* allocation of deviations among balancing authority areas for dynamic schedules.<sup>24</sup> Therefore, the ISO has revised Section 6.4 of the agreement to state that the ISO and the host balancing authority will share in the real-time deviations from the dynamic, non-regulation ancillary services and energy from the dynamic system resource, for which the ISO's maximum responsibility will be on a *pro rata* basis.<sup>25</sup> This revision is intended to allow dynamically scheduled resources to schedule only a portion of their output in the ISO's markets while avoiding the potential for the allocation of excessive costs to the ISO's market participants that can result if the ISO assumes the entire amount of any deviation by such resources from their scheduled output. Revised Section 6.4 also specifies that the host balancing authority will remain responsible for regulation obligation for a portion of the system resource's output not dynamically scheduled into the ISO balancing authority area in accordance with WECC and NERC reliability standards.

The ISO is also updating the ISO's current address in this agreement, modifying recital C to remove references to an interconnected balancing authority area operating agreement, modifying Section 2.2.1 to reference Appendix M instead of Appendix X, making minor punctuation changes to Section 3.1, and modifying Section 3.2 to correct the inadvertent omission of a reference to the WECC reliability standards in addition to those of NERC. In addition, the ISO proposes to revise the existing term *dynamic scheduling host balancing authority operating* in Appendix A to the tariff to add the word *agreement* to the end of the term, thus correcting an inadvertent omission in the existing tariff language, and to abbreviate the word *operating* in order to satisfy eTariff rules on permitted lengths of headings.

## **5. Modifications to the Dynamic Scheduling Protocol**

The ISO proposes a number of revisions to the dynamic scheduling protocol, which the ISO has moved from Appendix X to Appendix M to the tariff so it is located immediately before the new pseudo-tie protocol in Appendix N to the tariff. This move will make it easier to find those protocols in the tariff.

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<sup>24</sup> This sharing of deviations between balancing authorities does not apply to pseudo-tie resources, as the balancing authority for the attaining balancing authority area assumes full responsibility for deviations by a pseudo-tie resource. *See id.* at 28, 39.

<sup>25</sup> A dynamic system resource is defined in Appendix A to the ISO tariff as a "System Resource that has satisfied the CAISO's contractual and operational requirements for submitting a Dynamic Schedule, and for which a Dynamic Schedule has been submitted, including a Dynamic Resource-Specific System Resource."

The ISO proposes to include the existing provisions of the dynamic scheduling protocol in new Section 1 of that protocol applicable to dynamic schedules of imports to the ISO balancing authority area, after modifying the provisions to reflect the changes proposed in the dynamic transfers final proposal and to include enhancements and clean-up changes. The ISO proposes to add new Section 2 to the protocol to incorporate provisions applicable to dynamic schedules of exports of energy from generating units in the ISO balancing authority area that largely parallel those in Section 1.

Sections 1 and 2 of the dynamic scheduling protocol will include the following provisions:

- Sections 1.1 and 2.1 each require consistency with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines. The ISO proposes to revise the existing provisions of Section 1.1, and to incorporate similar provisions in Section 2.1, to expand the listing of NERC and WECC compliance requirements and to remove references to the non-binding NERC dynamic transfers white paper and the potential need for NERC-specified peer review of new dynamic functionality.
- Sections 1.2 and 2.2 each address the contractual relationships among the ISO, the relevant balancing authorities, and the relevant scheduling coordinators that are required in order to implement a dynamic scheduling arrangement. The ISO proposes to revise the existing requirements of Section 1.2.1, and to incorporate similar provisions in Section 2.2.1, to make the requirements for inter-balancing authority agreements less prescriptive.
- Sections 1.3 and 2.3 each set forth communications, telemetry, and other technical requirements applicable to the dynamic scheduling functionalities. The ISO proposes to revise the existing provisions of Sections 1.3.2, 1.3.3, and 1.3.4, and to incorporate similar provisions in Sections 2.3.2, 2.3.3, and 2.3.4, to relax the existing requirements for the backup communications link for the dynamic signal between the energy management systems of the host balancing authority and the receiving balancing authority.
- Sections 1.4 and 2.4 set forth the ISO's authority to establish limits on, respectively, dynamic imports and dynamic exports. The ISO proposes to revise the existing provisions of Section 1.4.1, and to incorporate similar provisions in Section 2.4.1, to specify its authority to implement a moratorium on new dynamic schedules at a particular intertie if it determines that the volume of dynamic transfers at that intertie could have an adverse effect on system reliability, which moratorium is discussed in more detail in Section II.D.3 of this transmittal letter.

- Sections 1.5 and 2.5 each set forth operating and scheduling requirements for dynamic schedules. See below for further discussion of these provisions.
- Section 1.6 sets forth requirements regarding certification, testing, and performance monitoring of dynamic imports of ancillary services. See below for further discussion of these provisions.<sup>26</sup>
- Sections 1.7 and 2.6 each set forth provisions regarding compliance, losses, and financial settlements applicable to dynamic scheduling. The ISO proposes to revise the existing provisions of Section 1.7.3, and to incorporate similar provisions in Section 2.6.2, to make clear that the limits established by transmission reservations are subject dispatch instructions for imbalance energy as well as dispatch instructions for the delivery of energy associated with ancillary services.

In the stakeholder process leading up to the filing of this tariff amendment, certain stakeholders correctly pointed out that the requirement in Section 1.5.1 (formerly Section 6.1) of the dynamic scheduling protocol that dynamic schedules must be supported by firm transmission reservations in each hour can create an unnecessary obligation for day-ahead scheduling. Based on this stakeholder feedback, the ISO stated that it would propose to modify Section 1.5.1 (formerly Section 6.1) to allow dynamic schedules for energy (but not pseudo-ties) to use non-firm transmission through external balancing authority areas.<sup>27</sup> Therefore, the ISO proposes to modify Section 1.5.1 of the protocol accordingly, and to reflect the availability of non-firm transmission for dynamic schedules of energy in its business practice manuals. In implementing this revision to Section 1.5.1, the ISO has distinguished between dynamic schedules of energy, for which the existing requirement of firm transmission service is being relaxed, and dynamic schedules of ancillary services, for which the requirement of firm transmission service remains in effect. The ISO has also proposed to add a provision to Section 1.5.1 specifying the need to report a derate in the ISO's outage management system in the event the transmission reservation and any additional available transmission are insufficient to support dispatch of the energy from the dynamic schedule up to its maximum available capacity.

In the dynamic transfers final proposal, the ISO stated that the capability for a resource's real-time dispatch to exceed its day-ahead or hour-ahead

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<sup>26</sup> Section 2 of the dynamic scheduling protocol does not include any similar provisions in this regard, because this dynamic transfers tariff amendment does not include proposed tariff provisions to implement dynamic exports of ancillary services.

<sup>27</sup> Dynamic transfers final proposal at 36-37, 39.

transmission reservation can be useful for a dispatchable dynamic transfer as well as for an intermittent dynamic transfer, by allowing the resource to be dispatched for peaking capacity when needed by the ISO's system conditions, when transmission capacity is available in real-time. A fast-start peaker resource may choose to submit an economic bid without establishing a day-ahead or hour-ahead transmission reservation, and be available for real-time dispatch on a similar basis as a peaker resource within the ISO's balancing authority area. To accommodate this, the dynamic transfers final proposal stated that the ISO would clarify Section 1.5.8 (formerly Section 6.8) of Appendix M (formerly Appendix X) of the ISO tariff to be applicable to imbalance energy as well as ancillary services.<sup>28</sup> The ISO has proposed to make that revision to Section 1.5.8.

In the dynamic transfers final proposal, the ISO stated that, with certain qualifications, it was prepared to support the division of a single generating unit outside the ISO balancing authority area into separate dynamically scheduled resources.<sup>29</sup> Therefore, the ISO proposes to include provisions in Sections 1.5.12 and 2.5.10 of the protocol stating that only one dynamic system resource may be associated with any one physical generating resource, unless the ISO approves an implementation plan to establish multiple dynamic system resources for that generating resource.<sup>30</sup> Each separate dynamic system resource established pursuant to these provisions will need to meet the requirements for dynamic scheduling individually, including telemetry requirements.

The ISO proposes to revise other existing provisions of Section 1.5 (formerly Section 6) of Appendix M. The revisions to Sections 1.5.4, 1.5.7, 1.5.10, and 1.5.13, and the related provisions of Sections 2.5.5 and 2.5.8, are explained in other sections of this transmittal letter. The ISO also proposes to revise the existing provisions of Section 1.5.2, and to incorporate similar provisions in Section 2.5.1, to make clear that electronic tags are required for all dynamic schedules and not just those that are newly implemented. The ISO proposes to revise the existing provisions of Section 1.5.3, and to incorporate

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<sup>28</sup> *Id.* at 15-16, fn. 12.

<sup>29</sup> *Id.* at 35-36. With respect to pseudo-ties, however, the ISO explained that its business systems (particularly metering) would not be able to support creating separate pseudo-tie resources based on a single generating unit, just as the ISO cannot divide generating units within its own balancing authority area into multiple resources. *Id.* at 36.

<sup>30</sup> No tariff changes besides those discussed above are necessary to permit multiple dynamic system resources for a single physical generating resource. Accommodation of multiple dynamic system resources for a single physical generating resource is implicit in the existing definition in Appendix A to the tariff of the term dynamic system resource as a type of system resource, because a system resource is defined in Appendix A as "[a] *group of resources*, single resource, or a portion of a resource located outside of the CAISO Balancing Authority Area . . . ." (Emphasis added.)

similar provisions in Section 2.5.2, to provide each balancing authority for an intermediary balancing authority area the option whether to have a dynamic signal routed through its energy management system. This revision is based on the ISO's experience that not all balancing authorities want this functionality, including the need for the ISO to seek a waiver of the existing provisions of this section from the Commission in conjunction with a new set of dynamic scheduling agreements. The ISO proposes to revise Section 1.5.9 to correct the grammar of the provision. Finally, the ISO proposes to revise the existing provisions of Section 1.5.11, and to incorporate similar provisions in Section 2.5.9, to incorporate a different approach to specifying the maximum value for a dynamic schedule. The ISO's new approach bases this maximum value on the ISO's specified dispatch operating point for the dynamic schedule, which the ISO considers to be the more appropriate value against which to evaluate that maximum value.

In the stakeholder process, some stakeholders expressed concerns about the forms of documentation required by the dynamic scheduling protocol, particularly some of the documentation required of affected balancing authorities in connection with certification of the ability to provide ancillary services from a dynamic system resource. The ISO proposed to modify these documentation requirements to address stakeholders' concerns.<sup>31</sup> To that end, the ISO proposes to modify the certification requirements set forth in Sections 1.6, 1.6.1, 1.6.3, and 1.6.5, and proposes to delete Attachment A to the dynamic scheduling protocol, which contains a form of request for certification of imports of spinning and non-spinning reserves for which the associated energy is delivered dynamically from a system resource.<sup>32</sup> The ISO proposes these revisions to remove the requirement that the host balancing authority be directly involved in the ISO's certification of dynamic imports of ancillary services, leaving only the requirement that the responsible scheduling coordinator obtain such certification pursuant to the ISO tariff provisions and operating procedures applicable to ancillary services certification and that it do so with the cooperation of the host balancing authority.

The definition of the term *dynamic scheduling host balancing authority operating agreement* in Appendix A to the tariff has been updated to cross-reference the new location of the dynamic scheduling protocol in Appendix M (formerly Appendix X) to the tariff. The ISO has also updated this cross-reference to the dynamic scheduling protocol in Sections 4.5.4.3.1, 8.3.2, and 8.3.4 of the tariff, in Section 3.2.2 of the *pro forma* dynamic scheduling

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<sup>31</sup> Dynamic transfers final proposal at 37.

<sup>32</sup> In connection with these tariff changes, the ISO will also make modifications to its standards for imports of regulation, which are available on the ISO's website at <http://www.caiso.com/docs/2000/05/09/20000509165702192.pdf>.



agreement for scheduling coordinators set forth in Appendix B.5 to the tariff, in Section 2.2.1 of the *pro forma* dynamic scheduling host balancing authority operating agreement set forth in Appendix B.9 to the tariff, and throughout new Appendix M itself.

### **C. Tariff Modifications Applicable Solely to Pseudo-Ties**

As noted above, the ISO has engaged in a number of successful pseudo-tie pilots, and is now proposing to amend its tariff to implement this functionality to and out of the ISO balancing authority area on a more general basis. Incorporating this functionality in the ISO's tariff will improve the efficiency of the ISO's markets as well as other electricity markets throughout the western interconnection, and is unanimously supported by stakeholders. At the same time, the ISO has drafted tariff language to ensure that this functionality will be implemented in a manner that preserves the reliability of its grid and other affected grids, and does not create adverse seams issues.

#### **1. Definitions Relating to Pseudo-Ties**

The ISO proposes to add or modify the following defined terms in Appendix A to the tariff in order to implement the ability of generators to engage in dynamic transfers through the pseudo-tie mechanism.

- The ISO has defined the new term *pseudo-tie* in Appendix A to mean a functionality by which the output of a generating unit physically interconnected to the electric grid in a native balancing authority area is telemetered to and deemed to be produced in an attaining balancing authority area that provides balancing authority services for and exercises balancing authority jurisdiction over the pseudo-tie.
- In connection with this definition of the new term pseudo-tie, the ISO has modified elements of the definition of the existing term *generating unit* in Appendix A to incorporate the concept of a pseudo-tie of a generating unit to the ISO balancing authority area. Similarly, the ISO has modified elements of the definitions of the existing terms *node* and *wheeling out* in Appendix A to incorporate pseudo-ties of generating units to the ISO balancing authority area. In addition, the ISO has added a definition of the new term *pseudo-tie participating generator agreement*, which the owner of a pseudo-tie generating unit must enter into with the ISO. And most significantly, the ISO has modified the definition of the existing term *participating generator* to include a signatory to a pseudo-tie participating generator agreement. This ensures that a pseudo-tie of a generating unit to the ISO balancing authority area will be treated in the same manner as any other participating generator, subject to any exceptions expressly specified in the tariff revisions.

- The ISO has added two new defined terms to Appendix A to distinguish between the balancing authority area in which a pseudo-tie generating unit is interconnected to the electric grid and the balancing authority area in which a pseudo-tie generating unit is deemed to provide its output. The ISO has defined the new term *native balancing authority area* as the balancing authority area where a pseudo-tie generating unit is physically interconnected to the electric grid. The ISO has defined the new term *attaining balancing authority area* as the balancing authority area where the output of a pseudo-tie generating unit is fully included for purposes of calculation of area control error and meeting balancing authority area load responsibilities.

## **2. Modifications to the Body of the Tariff and Appendix I to Implement Pseudo-Ties**

The ISO has also made a number of modifications to the body of its tariff in order to implement pseudo-tie functionality to and out of the ISO balancing authority area. The ISO has added new Sections 4.15 and 4.16 to the tariff to specify the general scope of the provisions regarding pseudo-ties of generating units into and out of the ISO balancing authority area, respectively, and to provide references to the more detailed provisions of the tariff regarding pseudo-ties. Section 4.15 states that a generator that desires a pseudo-tie of its generating unit from a native balancing authority area to the ISO balancing authority area must comply with the applicable provisions of the pseudo-tie protocol contained in Appendix N to the ISO tariff, in addition to all provisions of the ISO tariff applicable to participating generators, except as expressly provided, including that the pseudo-tie will be required to enter into a pseudo-tie participating generator agreement with the ISO rather than a participating generator agreement. Section 4.16 states that a pseudo-tie of the output of a generating unit out of the ISO balancing authority area to an attaining balancing authority area must comply with the applicable provisions of the pseudo-tie protocol in Appendix N, including being the subject of a special operating agreement with the ISO.

In conjunction with the provisions of Section 4.15 and the expansion of the definition of a participating generator to include a generator with a pseudo-tie generating unit, the ISO has revised Sections 4.5.1.1.6.2, 4.6, 9.3.6, and 43.5.2 of the tariff to make clear that execution of a pseudo-tie participating generator agreement results in treatment as a participating generator (except as specified in the tariff).<sup>33</sup>

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<sup>33</sup> The ISO also proposes to incorporate the *pro forma* qualifying facility participating generator agreement set forth in Appendix B.3 into the list of other ISO agreements set forth in Sections 9.3.6 and 43.5.2 of the tariff.

The ISO has made a number of other revisions to the body of the tariff to clarify the treatment of pseudo-tie generating units in particular provisions. First, the ISO has clarified Section 4.6.1.1 of the tariff, which specifies the general responsibilities of participating generators to operate pursuant to relevant provisions of the tariff. As revised, Section 4.6.1.1 clarifies that, in addition to complying with the other requirements of Section 4.6.1.1 regarding the operation of its generating unit, a participating generator with a pseudo-tie of a generating unit to the ISO balancing authority area must comply with the requirements of the applicable provisions of the pseudo-tie protocol in Appendix N to the tariff.

In addition, the ISO has modified Section 8.1 of its tariff to make clear that the ISO will accept submissions to self-provide ancillary services from pseudo-ties of generating units to the ISO balancing authority area if they are certified to provide ancillary services pursuant to the terms of the tariff. Also, the ISO has modified Section 8.2.3.3 of the tariff, regarding requirements for voltage support, to recognize that a pseudo-tie generating unit is likely to be interconnected to the system of a utility other than a participating transmission owner or utility distribution company.

The ISO has also modified Sections 4.6, 6.5.5.1.1, 8.3.1, 8.3.2, 8.3.7, 16.5.1, 17.2.1, 30.7.6.2, and 33.6 of the tariff to ensure that it is clear that those tariff provisions applicable to resources internal to the ISO balancing authority area include pseudo-ties of generating units to the ISO balancing authority area. These changes reinforce the fact that such pseudo-tie generating units will be treated, in most respects, in a manner identical to generating units internal to the ISO balancing authority area.

The ISO has included only a very few provisions that treat pseudo-ties of generating units to the ISO balancing authority area differently from the units of other participating generators. Among other revisions to this effect, the ISO has modified Section 2.2.1 of the station power protocol set forth in Appendix I to the tariff to specify that pseudo-ties of generating units to the ISO balancing authority area can participate in the ISO's station power program, but only if firm transmission service has been reserved across the transmission path from the ISO intertie to the pseudo-tie generating unit and station power service is provided by a utility within the ISO balancing authority area. Further, the ISO has modified Section 40.9.4.2.1 of the tariff, regarding the ability to provide substitute capacity for resource adequacy purposes, to specify that the provisions of that section are applicable only to resources internal to the ISO balancing authority area, and not to pseudo-ties of generating units to the ISO balancing authority area. Both of these differences in treatment reflect complications that the existence of intervening transmission facilities create for administration of the processes set forth in these tariff provisions, and the additional limitation on the application of the station power protocol reflects the difficulty to the ISO in

attempting to administer the station power program if station power service is provided by a utility outside the ISO balancing authority area. Other differences in treatment are described in Sections II.D.1 (special treatment regarding congestion) and II.D.2 (special treatment of intermittent resources) of this transmittal letter.

The ISO has also modified Section 8.3.2 of its tariff, regarding procurement of ancillary services from internal and external resources, to recognize that pseudo-tie generating units by virtue of their location will necessarily have to compete for use of intertie transmission capacity with imports, even though they are otherwise treated as internal to the ISO balancing authority area.

### **3. Addition of the New Pseudo-Tie Participating Generator Agreement**

In order to include in the ISO tariff a standard form of agreement that establishes the terms and conditions on which the ISO (as attaining balancing authority area) and a participating generator with a pseudo-tie of a generating unit interconnected within another balancing authority area will discharge their respective duties and responsibilities under the tariff, the ISO has added the new *pro forma* pseudo-tie participating generator agreement to Appendix B.16 to the tariff. The provisions of the *pro forma* pseudo-tie participating generator agreement are modeled after the applicable provisions of pilot pseudo-tie participating generator agreements submitted by the ISO that the Commission has previously accepted for specific pseudo-tie participating generators, and the provisions of those pilot agreements are themselves largely modeled after the applicable provisions of the *pro forma* participating generator agreement set forth in Appendix B.2 to the tariff and the *pro forma* dynamic scheduling agreement for scheduling coordinators set forth in Appendix B.5 to the tariff.<sup>34</sup>

The body of the *pro forma* pseudo-tie participating generator agreement includes the following provisions:

- Article I contains relevant defined terms and rules of interpretation.

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<sup>34</sup> See, e.g., filing of pseudo participating generator agreement between the ISO and Calpine Construction Finance Company, L.P., Docket No. ER06-58-001 (Jan. 17, 2006); Commission letter order, Docket No. ER06-58-001 (Mar. 1, 2006) (order accepting agreement); filing of pilot pseudo tie implementation agreement among the ISO, Pacific Gas and Electric Company, Sacramento Municipal Utility District, and Western Area Power Administration, Docket No. ER06-1470-000 (Sept. 6, 2006) (order accepting agreement); Commission letter order, Docket No. ER06-1470-000 (Oct. 23, 2006); filing of pseudo participating generator agreement with El Dorado Energy, LLC, Docket No. ER10-342-000 (Nov. 30, 2009); Commission letter order, Docket No. ER10-342-000 (Jan. 8, 2010) (order accepting agreement).

- Article II states the responsibility of the ISO for the efficient use and efficient operation of the ISO controlled grid and the ISO balancing authority area, and acknowledges that the ISO may be unable to satisfy these responsibilities fully if the participating generator fails to comply with all of its obligations.
- Article III provides for the effective date and termination of the pseudo-tie participating generator agreement, as discussed below.
- Article IV contains the general terms and conditions regarding pseudo-tie requirements and pseudo-tie participating generator obligations, the requirement to comply with all applicable provisions of the ISO tariff, and obligations relating to ancillary services and major incidents.
- Article V states that the pseudo-tie participating generator will be subject to all penalties made applicable to participating generators within the ISO balancing authority area.
- Article VI states that the pseudo-tie participating generator will be responsible for all costs incurred for the purpose of meeting its obligations under the pseudo-tie participating generator agreement.
- Articles VII through XI contain standard provisions concerning dispute resolution, liability, uncontrollable forces, *etc.*, which are very similar to the provisions of the *pro forma* participating generator agreement and the *pro forma* dynamic scheduling agreement for scheduling coordinators in this regard.

In addition, the *pro forma* pseudo-tie participating generator agreement contains the following schedules:

- Schedule 1, which sets forth relevant technical information; and
- Schedule 2, which sets forth notice information for the participating generator and the ISO.

The ISO proposes that the pseudo-tie participating generator agreement include the right to terminate or suspend the agreement in the event the pseudo-tie could cause the ISO to violate applicable reliability standards. The generating facility, although represented as if it is in the ISO balancing authority area, nonetheless remains interconnected to facilities that are not under ISO operational control. This may create a reliability concern for which the ISO believes a remedy is needed. For example, operating conditions or planning criteria could require the native balancing authority to take action that may have a detrimental effect upon the pseudo-tie. Although such circumstances may be

unlikely and did not surface during the pseudo-tie pilot program, the ISO remains concerned in view of the expected increase in the numbers of pseudo-ties and believes a suspension or termination right to be appropriate, particularly when stakeholder concerns have focused on financing requirements. If in fact there ever were such a circumstance and the ISO exercised its rights, once the conditions had changed such that a threat to reliability no longer existed, the ISO would restore the pseudo-tie, either by lifting the suspension or by entering into a new pseudo-tie participating generator agreement.

#### **4. Addition of the New Pseudo-Tie Protocol**

The ISO proposes to add the new pseudo-tie protocol to Appendix N to the ISO tariff to address pseudo-ties to and out of the ISO balancing authority area. The provisions of Section 1 of the pseudo-tie protocol are generally the same as the provisions contained in Schedule 2 of the pilot pseudo-tie participating generator agreements submitted by the ISO that the Commission has previously accepted for specific pseudo-tie participating generators,<sup>35</sup> as modified in this dynamic transfers tariff amendment to reflect the changes proposed in the dynamic transfers final proposal and to make various clean-up changes. These clean-up changes particularly include omission of several provisions that are necessary to incorporate by reference provisions of the tariff applicable to participating generators into the pilot agreements, but that are not necessary in these tariff revisions given the revision of the defined term *participating generator* to apply to pseudo-ties of generating units to the ISO balancing authority area. The revision of the term *participating generator* makes pseudo-ties of generating units to the ISO balancing authority area subject to all of the provisions of the tariff applicable to participating generators directly.

Section 1 of the protocol contains provisions that apply to pseudo-ties of generating units to the balancing authority area, and Section 2 contains somewhat parallel provisions that apply to pseudo-ties of generating units out of the ISO balancing authority area. The provisions of Section 2 are adapted from the provisions of Schedule 2 of the pilot pseudo-tie agreement for the pseudo-tie of the New Melones generating facility out of the ISO balancing authority area. Sections 1 and 2 of the pseudo-tie protocol include the following provisions:

- Sections 1.1.1 and 2.1.1 each require consistency with NERC and WECC requirements, which requirements are specified more generally than in some of the pilot agreements.
- Sections 1.2 and 2.2 each set forth ISO operational, technical, and business requirements, as discussed further below.

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<sup>35</sup> See Section II.C.3 of this filing, above.

- Sections 1.3 and 2.3 each set forth requirements regarding applicable operating agreements, which requirements are similar to those in the dynamic scheduling protocol as well as being adapted from pilot agreements previously accepted by the Commission.

Regarding the operational, technical, and business requirements set forth in the pseudo-tie protocol, several provisions not discussed elsewhere in this transmittal letter are worth mention. In Section 1.2.1.4, the ISO proposes to require demonstration of the ability to deliver the maximum output of a pseudo-tie generating unit by requiring a copy of the interconnection agreement for the unit. In Section 1.2.1.5, the ISO proposes to incorporate provisions from Section 1.5.1 of the dynamic scheduling protocol requiring a derate in the event transmission is unavailable. In Section 1.2.1.11, the ISO proposes to incorporate provisions from Section 1.5.11 of the dynamic scheduling protocol limiting the maximum real-time dynamic transfer from a pseudo-tie generating unit to its dispatch operating point. The ISO proposes to specify in Section 1.2.2.1 that communications and telemetry requirements for pseudo-tie generating units include both those applicable to dynamic schedules and those applicable to generating units in the ISO balancing authority area, given the unique circumstances of such units. With regard to the specification of business requirements applicable to pseudo-tie generating units in Section 1.2.3, the ISO included only very limited provisions relative to the pilot agreements, addressing only the differences in settlements and related treatment for pseudo-tie generating units from the tariff provisions otherwise applicable to pseudo-tie generating units as units of participating generators. In particular, the ISO has set forth in Section 1.2.3.5.1 a list of specific differences in settlements treatment for transfers from a pseudo-tie generating unit into the ISO balancing authority area.

Regarding pseudo-ties of generating units out of the ISO balancing authority area, the most significant difference from the pilot agreement for the New Melones generating facility is that the pseudo-tie protocol does not include any requirement for the use of existing transmission contract rights or ownership rights in order to reserve transmission across the ISO balancing authority area. Among other notable provisions, the ISO proposes in Section 2.2.2.1 not to impose the ISO's communication and telemetry requirements applicable to generating units in the ISO balancing authority area on pseudo-ties of generating units out of the ISO balancing authority area. The ISO proposes in Section 2.2.2.3 provisions for emergency service to an alternate intertie in the event delivery cannot be made to the designated intertie associated with the pseudo-tie of the generating unit out of the ISO balancing authority area. The ISO proposes in Section 2.2.3.2 to incorporate provisions regarding the exposure of a pseudo-tie of a generating unit out of the ISO balancing authority area to transmission losses.

In the dynamic transfers final proposal, the ISO stated that it would continue to support layoffs from pseudo-tie generating units (*i.e.*, sales of a portion of a pseudo-tie generating unit's output back to its native balancing authority area), as the ISO has done for its pilot pseudo-tie arrangements for pseudo-ties of generating units to the ISO balancing authority area. The ISO also specified that layoff exports from a pseudo-tie generating unit will be charged at the same location (*i.e.*, at the same locational marginal price) that the pseudo-tie generating unit is paid for its generation output.<sup>36</sup> The ISO has included provisions in Sections 1.2.1.9, 1.2.3.1, and 1.2.3.5.2 of the pseudo-tie protocol in order to support layoffs from pseudo-tie generators as discussed in the dynamic transfers final proposal. The provisions of Sections 2.2.1.2, 2.2.1.3, 2.2.1.5, and 2.2.3.5 of the pseudo-tie protocol specify different treatment for pseudo-ties of generating units out of the ISO balancing authority area in this regard, due to limitations of the ISO's systems and the different circumstances of pseudo-ties out.

**D. Tariff Modifications Applicable to Both Dynamic Schedules and Pseudo-Ties**

**1. Tariff Modifications Regarding Market Modeling, Pricing, and Settlement**

The ISO has modified Section 27.5.1.1 of the tariff, which addresses the base market model used in the ISO markets, to state that the dispatch, schedule, and locational marginal price of a dynamic system resource or pseudo-tie of a generating unit to the ISO balancing authority area refer to a pricing node or aggregated pricing node, if applicable, reflective of the resource's physical location in the external transmission systems that are modeled in the base market model, subject to the modeling of transmission losses in the portions of the full network model and exclusion of the effects of such transmission losses on the locational marginal prices that are external to the ISO balancing authority area.<sup>37</sup> Modified Section 27.5.1.1 also states that the locational marginal price thus associated with a dynamic system resource or pseudo-tie generating unit will be used for settlement of energy and will include the marginal cost of congestion and marginal cost of losses components of the locational marginal

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<sup>36</sup> Dynamic transfers final proposal at 35.

<sup>37</sup> Regarding the use of an aggregated pricing node (if applicable) under these tariff provisions, the ISO explained in the dynamic transfers final proposal that it generally supports aggregation of conventional and/or renewable resources that are electrically close together, although the acceptability of a proposed resource aggregation needs to be determined by the balancing authorities for both the native balancing authority area and the attaining balancing authority area. *Id.* at 31-33.



price to that dynamic system resource or pseudo-tie generating unit point, excluding losses and congestion external to the ISO balancing authority area. These tariff modifications are consistent with the dynamic transfers final proposal, in which the ISO explained that it will model and price dynamic resource-specific system resources and pseudo-tie generating units at their actual physical locations.<sup>38</sup> Doing so allows the ISO to establish feasible interchange schedules and thereby maintain the reliable operation of the ISO's transmission system by modeling and pricing the resulting flows as accurately as possible.

The implementation of locational marginal prices for dynamic transfers does not require substantial system development or tariff modification since the ISO already computes locational marginal prices for resource locations beyond the ISO's boundaries, external to the ISO balancing authority area and the ISO controlled grid. Sections 27.1 and 27.5 and Appendix C of the ISO tariff detail the ISO's existing locational marginal price calculations, including locational marginal prices at locations outside the ISO balancing authority area and the ISO controlled grid. The added text in Section 27.5.1.1 is sufficient to establish the use of locational marginal prices for all dynamic transfers (both dynamic schedules and pseudo-ties), without repeating this language in Appendices M and N.

To clarify that Section 27.5.1.1 applies to both dynamic schedules and pseudo-ties, the ISO has incorporated references to this tariff section into the provisions of Sections 1.7.4 and 2.6.3 of Appendix M (formerly Appendix X) and Section 1.2.1.1 of Appendix N. (Regarding the special circumstances of a pseudo-tie of a generating unit out of the ISO balancing authority area, the ISO has incorporated a more general provision regarding the treatment of transmission losses in Section 2.2.3.2 of Appendix N.) The ISO's market network model already contains detailed models of certain external balancing authority areas using looped network configurations that encompass the majority of the ISO's scheduling points. The ISO will evaluate and implement the practicable expansion of the market network model needed for appropriate modeling of additional dynamic transfers. Within the existing modeling of external balancing authority areas, the ISO models existing dynamic transfers at locations that are essentially adjacent to, or have the same locational marginal prices as, their physical locations. Therefore, uniformly modeling the existing dynamic transfers at their physical locations will have negligible impacts on existing congestion revenue rights and existing transmission contract rights. Further, modeling existing dynamic transfers at their physical locations will not require redefinition of existing transmission constraints. When new dynamic transfers become operational, the ISO will define their physical locations as

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*Id.* at 27-28.

pricing nodes based on the physical network topology. The ISO will enforce unit characteristics of dynamically transferred resources in market runs through the same processes that apply to generating units within the ISO balancing authority area.

In the dynamic transfers final proposal, the ISO noted that Sections 11.10.1.1.1 and 11.10.9.1 of the tariff establish the congestion charges and credits assessed in the event a dynamic system resource that is providing ancillary services becomes undeliverable due to a transmission derate. The ISO explained that it would clarify that these sections are applicable to all dynamic transfers (including pseudo-ties of generating units) that are providing ancillary services, and stated that similar provisions will apply for credits for release of transmission reservations that occur prior to the hour-ahead scheduling process due to a transmission derate.<sup>39</sup> These clarifications address the fact that congestion may exist between a dynamically transferred resource and the ISO balancing authority area. Therefore, the ISO has modified Sections 11.10.1.1.1 and 11.10.9.1 of its tariff, as well as Sections 11.10.1.2.1 and 11.10.1.3.1 of the tariff, to include the appropriate clarifications regarding the assessment of congestion charges and credits to dynamic system resources and pseudo-tie generating units.

## **2. Tariff Modifications Regarding Intermittent Resources**

In the dynamic transfers final proposal, the ISO explained that, like conventional resources, intermittent resources will need to comply with all applicable tariff requirements before they can establish a dynamic transfer with the ISO. Further, the tariff provisions that apply to eligible intermittent resources that do not participate in the ISO's participating intermittent resource program will also apply to dynamic transfers of intermittent resources. The dynamic transfers final proposal pointed out that intermittent resources outside the ISO's balancing authority area are currently not eligible for the ISO's participating intermittent resource program and that the ISO is considering inclusion of such resources in that program in a separate stakeholder process.<sup>40</sup> The ISO proposes to revise the tariff provisions regarding eligible intermittent resources to apply those provisions to intermittent resources that utilize pseudo-ties and dynamic schedules as follows.

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<sup>39</sup> *Id.* at 16.

<sup>40</sup> *Id.* at 9, fn. 4. As noted in the dynamic transfers final proposal, the appropriate scope of the ISO's participating intermittent resource program is under consideration in the ISO's "Renewable Integration Market and Product Review" stakeholder process that is currently ongoing. Information on this stakeholder process is available at <http://www.caiso.com/informed/Pages/StakeholderProcesses/RenewablesIntegrationMarketProductReviewPhase1.aspx>.

Most significantly, the ISO proposes to expand the scope of the existing term *eligible intermittent resource* to include dynamic system resources and pseudo-ties of generating units to the ISO balancing authority area. This ensures that intermittent resources that utilize dynamic schedules and pseudo-ties to the ISO balancing authority area will be treated the same as other eligible intermittent resources under the tariff except as otherwise specified.

In conjunction with the expansion of the definition of an eligible intermittent resource, the ISO has also made clarifying modifications to the eligible intermittent resources protocol set forth in Appendix Q to the tariff. The ISO has modified Section 2.2.1(a) of that protocol to expand the list of required agreements, one of which an eligible intermittent resource must execute depending on its circumstances unless otherwise inapplicable, to include the dynamic scheduling agreement for scheduling coordinators or the pseudo-tie participating generator agreement. However, to reflect the fact that dynamic system resources are not required to install ISO-certified and -polled revenue metering, the ISO has modified Section 2.2.1(b) of the protocol to exclude dynamic system resources from the requirement applicable to other eligible intermittent resources to execute a meter service agreement for ISO metered entities, unless the eligible intermittent resource is not subject to those agreements pursuant to the ISO tariff (*e.g.*, unless the resource is an eligible intermittent resource of an MSS operator).

The ISO also proposes to modify Section 2.2.2 of the eligible intermittent resources protocol to maintain the current status that the ISO's participating intermittent resource program does not include resources outside the ISO balancing authority area, pending the outcome of the separate stakeholder process addressing that matter discussed above. Section 2.2.2(c) currently provides that a participating intermittent resource must be electrically connected at a single point on the ISO controlled grid unless otherwise permitted. This requirement would generally continue to operate to limit participation to resources within the ISO balancing authority area pending the outcome of the separate stakeholder process. However, there is a small portion of the ISO controlled grid that extends outside the ISO balancing authority area. The expansion of the definition of an eligible intermittent resource in these proposed tariff revisions to include resources currently outside the ISO balancing authority area creates the possibility that such a resource could avoid the limitation otherwise imposed by Section 2.2.2(c) by connecting to the small portion of the ISO controlled grid outside the ISO balancing authority area. As the ISO did not address the merits of eligibility for the participating intermittent resource program in the stakeholder process on these tariff revisions, the ISO wishes to avoid providing some incidental interim opportunity for this possibility as a result of these tariff revisions prior to the outcome of the separate stakeholder process addressing this matter directly. To preserve the status quo for the interim, the

ISO proposes to modify Section 2.2.2(c) to add a provision stating that interconnection to a portion of the ISO controlled grid outside or not contiguous to the ISO balancing authority area by an eligible intermittent resource that is a dynamic system resource or pseudo-tie to the ISO balancing authority area does not make that resource eligible to be included within a participating intermittent resource. This will leave the substantive determination regarding eligibility for the participating intermittent resource program to be implemented through subsequent revisions to this and other provisions of the tariff to reflect the outcome of the separate stakeholder process.

As for other proposed revisions to address the special circumstances of intermittent resources, the ISO proposes to include in Sections 1.5.10 and 2.5.8 of the dynamic scheduling protocol set forth in Appendix M (formerly Appendix X) to the tariff provisions recognizing that dynamic imports of eligible intermittent resources are not subject to ordinary inertia ramping practices applicable to other types of resources, and proposes to include in Sections 1.2.1.10 and 2.2.2.1 of the new pseudo-tie protocol set forth in Appendix N to the tariff additional requirements for the provision of meteorological, operational, and forecast data applicable to pseudo-ties of generating units that are eligible intermittent resources to and from the ISO balancing authority area in order to ensure that the ISO receives sufficient data from these resources to permit it to operate reliably.

One other tariff revision that the ISO proposes to make in recognition of the special circumstances of intermittent resources whose output will be dynamically transferred to the ISO balancing authority area is a revision to Section 34.11.2 of the tariff to clarify the dispatch operating target that the ISO will use for such resources, given the variability of their output. The ISO proposes to add a new subsection (iv) to the end of Section 34.11.2 to state that a dynamic system resource or pseudo-tie generating unit that is an eligible intermittent resource will be dispatched based on the most recently available telemetry for the actual output. The ISO considers this the best available indicator of the actual output of these types of resources absent their ability to follow dispatch instructions.

Further, the ISO proposes to modify Sections 40.8.1.6 and 40.8.1.12.1 of its tariff, which address the measurement of the qualifying capacity and deliverability of capacity from wind and solar units for resource adequacy purposes, to clarify the applicability of the provisions of those sections to dynamic transfers. The ISO proposes to modify Section 40.8.1.12.1, regarding the deliverability of capacity of dynamic system resources, to extend the provisions of that section to pseudo-ties of generating units to the ISO balancing authority area, given their similar circumstances with regard to intervening transmission. The ISO also proposes to revise that section to clarify that both types of resources are subject to the limitation on the qualifying capacity of wind and solar

resources set forth in Section 40.8.1.6. In connection with those modifications to Section 40.8.1.12.1, the ISO proposes to modify Section 40.8.1.6 to remove any implication that it applies only to generating units in the ISO balancing authority area (in order to ensure that it is applicable to dynamic system resources) and to provide an alternative approach for the determination of qualifying capacity for wind or solar units with less than three years of operating history to the otherwise applicable requirement that the determination be based on production data from other comparable resources in the same transmission access charge area. It is unlikely that intermittent resources that are dynamic system resources or pseudo-tie generating units will be located in an existing transmission access charge area, as those areas are based on the current boundaries of the ISO balancing authority area. And the ISO does not consider it useful to attempt to establish new or revised transmission access charge areas just for the purpose of specifying areas from which it would attempt to gather production data from comparable intermittent resources for use in establishing the qualifying capacity for a relatively new wind or solar dynamic system resource or pseudo-tie generating unit. Consequently, the ISO proposes to revise Section 40.8.1.6 to provide the ISO some discretion in determining the appropriate comparable production data from which to determine the qualifying capacity of an intermittent resource that is a dynamic system resource or pseudo-tie generating unit.

### **3. Tariff Modifications Regarding ISO Authority to Impose a Moratorium on New Dynamic Transfers**

The ISO already has the authority, pursuant to Section 1.4.1 (formerly Section 5.1) of the dynamic scheduling protocol set forth in Appendix M (formerly Appendix X) to the tariff, to establish limits applicable to the amount of any ancillary services and/or energy imported into the ISO's balancing area authority, whether delivered dynamically or statically, based on certain characteristics set forth in Section 1.4.1. During the stakeholder process on this initiative, stakeholders raised concerns regarding the potential for the number of requests for dynamic transfers at a particular intertie, particularly for dynamic transfers of intermittent resources, to take up a substantial portion of the transfer capability of the intertie, thereby increasing congestion, limiting static schedules at that intertie, and potentially resulting in adverse impacts on system reliability. In Section I of this transmittal letter, the ISO describes the conclusions of the ISO's technical studies that no dynamic transfer capability limits need to be applied at this time to dynamic transfers of intermittent resources to the ISO's balancing authority area. However, to further allay the concerns of stakeholders, the ISO committed in the dynamic transfers final proposal that as part of its overall operational response to increasing levels of generation by intermittent resources, it will monitor any operational issues that relate to dynamic transfers and, if limitations become apparent in the future, the ISO will identify appropriate responses, including potentially limiting new dynamic transfers of intermittent

resources without limiting dynamic transfers that would have already been established.<sup>41</sup>

To implement this commitment, the ISO is proposing to add language to Sections 1.4.1 and 2.4.1 of the dynamic scheduling protocol, and to Sections 1.2.1.15 and 2.2.1.11 of the new pseudo-tie protocol set forth in Appendix N to the tariff, to specify that the ISO reserves the authority to implement a moratorium on the establishment of new dynamic schedules and new pseudo-ties associated with a particular intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on system reliability. If the ISO implements such a moratorium, it will undertake studies to determine technical options to address the effect of dynamic transfers on the capacity of the affected intertie in order to eliminate the moratorium.

#### **E. Miscellaneous Changes, Clarifications, and Corrections**

In order to accommodate the move of the existing provisions of the dynamic scheduling protocol from Appendix X to Appendix M to the tariff, the existing provisions of Appendix M need to be moved to another location in the tariff. As the existing provisions of Appendix M relate to reliability standards for transmission operations, the ISO proposes to move those provisions to Section 7.2 of the tariff relating to operating reliability criteria. Although the move of these provisions from Appendix M to Section 7.2 is shown as changed text in Attachment B to this filing, the ISO does not propose to make any change to the substance of these provisions.

In addition, during the stakeholder process on this initiative, stakeholders expressed concern that the current provisions of the dynamic scheduling protocol and provisions that the ISO proposes to add in this amendment use the term operating order without clearly specifying the meaning of this term as it applies to dynamic transfers. As the ISO explained in the dynamic transfers final proposal, the term operating order (used without initial capitalization) is defined in Section 37.2.1.1 of the ISO tariff to be different from a routine dispatch instruction (with dispatch instruction being a defined term), because an operating order is more focused on conditions when reliability requires a specific response to the ISO operator's instructions.<sup>42</sup> In the stakeholder process leading to this amendment,

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<sup>41</sup> Dynamic transfers final proposal at 30.

<sup>42</sup> *Id.* at 21-22, 24-25. Section 37.2.1.1 of the tariff states that, “[f]or purposes of enforcement under this Section 37.2, an operating order shall be an order(s) from the CAISO directing a Market Participant to undertake a single, clearly specified action (e.g., the operation of a specific device, or change in status of a particular Generating Unit) that is feasible and intended to resolve a specific operating condition. Deviation from an ADS Dispatch Instruction shall not constitute a violation of this Section 37.2.1.1.” By comparison, a dispatch instruction is defined in Appendix A to the tariff as an “instruction by the CAISO for an action with respect to specific equipment, or to a resource for increasing or decreasing its Energy Supply or Demand from the

the ISO stated that it planned to distinguish operating orders from routine dispatch instructions as they apply to dynamic transfers.<sup>43</sup> Consistent with that plan, the ISO proposes to specify in Sections 1.5.7 and 2.5.5 of the dynamic scheduling protocol set forth in Appendix M (formerly Appendix X) to the tariff, and in Sections 1.2.1.3, 1.2.2.3, and 2.2.1.10 of the new pseudo-tie protocol set forth in Appendix N to the tariff, that an operating order as described in those sections means an operating order as defined in Section 37.2.1.1. The definition of this term in Section 37.2.1.1 has been the subject of recent consideration and direction for revision by the Commission with regard to revisions to tariff Section 37 generally. The ISO only proposes in this set of tariff revisions to clarify the use of this term in relation to dynamic transfers. The ISO does not intend for the Commission to reconsider the definition of this term as recently accepted by the Commission in Section 37.2.1.1.

In conjunction with its other revisions to the substance of the tariff provisions regarding dynamic transfers, the ISO identified the need for a clarification of the references in the tariff to the standards for imports of regulation that the ISO is required to post on its website. In anticipation that the ISO may in the future determine to specify these standards in some other form, the ISO has revised the following provisions to incorporate a reference to any successor standards the ISO may establish to the current standards for imports of regulation: Sections 1.3.1, 1.5.13, and 1.6 of Appendix M (formerly Appendix X) and Section 1.2.2.4 of Appendix N.

Another set of minor clarifications that the ISO proposes to make that are not directly related to dynamic transfers is to clarify the references to the need for compliance with requirements of the Nuclear Regulatory Commission in several provisions where the ISO is also proposing revisions more directly implementing its dynamic transfers initiative. The ISO proposes to revise the following provisions to make clear that compliance with requirements of the Nuclear Regulatory Commission is separate from compliance with NERC and WECC reliability standards: Sections 4.5.4.3.1, 8.1, 8.2.3.3, 8.3.7.1, and 8.3.7.2 of the tariff and Sections 1.4.2 and 1.5.4 of Appendix M (formerly Appendix X).

The ISO proposes to make minor clarifications and corrections of capitalization, spacing, and punctuation errors in Sections 8.1, 8.3.1, 8.3.2, 8.3.7.1, 27.5.1.1, and 30.7.6.2 of the tariff, and in the definition of the terms *generating unit* and *interruptible imports* in Appendix A to the tariff.

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Day-Ahead Schedule, RUC [residual unit commitment] Schedule, and Day-Ahead AS [ancillary service] Award to a specified Dispatch Operating Point pertaining to Real-Time operations.”

<sup>43</sup> Dynamic transfers final proposal at 22, 25-26.

### III. Future Dynamic Transfer Enhancements

As explained in the dynamic transfers final proposal, the stakeholder process also addressed enhancements for dynamic transfers that the ISO plans to implement in the future.<sup>44</sup> These features will require changes to the ISO's market software systems and other related business systems. The implementation of these future enhancements will also require additional tariff changes, which the ISO will file with the Commission closer to the date when the software functionality is available. However, the implementation of the tariff revisions contained in this filing is in no way dependent on the implementation of the future enhancements. The future enhancements concern the following subjects:

- Transmission reservations – By the spring of 2013, the ISO plans to implement software changes and related tariff revisions to allow dynamic transfers to specify maximum deliveries exceeding their expected average deliveries of transmission reservations in the ISO market through an economic bid, and to settle congestion charges and the ISO's grid management charge for the greater of scheduled and actual delivery. At a minimum, the ISO will establish transmission reservations based on energy schedules and ancillary service awards. Once software changes can be implemented, allowing dynamic transfers to specify maximum deliveries exceeding their expected average delivery of energy through an economic bid will account for the variation in the output of renewable resources. Given that the ISO provides hourly firm transmission and requires external transmission to be procured only for each operating hour, the ISO will discourage market participants from scheduling excess transmission capacity for dynamic transfers through the settlement of congestion charges and the ISO's grid management charge for the greater of scheduled and actual delivery.

Until those changes go into effect, transmission reservations for dynamic transfers will be conducted using the ISO's existing software and existing tariff language as modified by this tariff amendment, under which dynamic schedules use the value for expected deliveries as the transmission reservation in the ISO market.<sup>45</sup> The ISO will continue to dispatch dynamic transfers in compliance with NERC and WECC standards, including limiting day-ahead and hour-ahead transmission reservations to the available transmission capability, and limiting the sum of all real-time energy dispatches and ancillary service awards to the available

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<sup>44</sup> *Id.* at 39-40.

<sup>45</sup> *Id.* at 13-16, 39-40; mapping table set forth in Attachment E to this filing at 1; ISO board memorandum set forth in Attachment G to this filing at 3, 6.



transmission capability. These scheduling and dispatch processes do not require the ISO to limit dynamic transfers' real-time energy deliveries to the transmission reservations. Instead, the ISO will consider real-time energy dispatches in excess of the initial transmission reservations to be accompanied by recallable transmission reservations that are awarded only for the duration of the dispatch interval. The ISO recognizes that this practice is not currently used by some neighboring transmission providers, and the ISO's proposed tariff revisions require derates to be reported in the ISO's outage management system to ensure that the ISO's dispatches would not cause energy deliveries to exceed transmission reservations outside the ISO if the market participant is not able to obtain additional transmission during an operating hour.

- Congestion management – As described above, this tariff amendment adds a provision to Section 34.11.2 to allow the ISO's dispatch operating target to recognize the variability of renewable resources by dispatching a dynamic system resource or pseudo-tie generating unit of an eligible intermittent resource based on the most recently available telemetry for its actual output. By the spring of 2013, the ISO plans to implement software changes in conjunction with additional ISO tariff revisions in order to allow intermittent resources to update their expected energy availability profile by five-minute intervals within the operating hour, and extending for a forward-looking two-hour period. Until those changes go into effect, congestion management will be conducted using an interim approach set forth in the ISO's operating procedures.<sup>46</sup>

An additional area in which the ISO may need to enhance its market functionality relates to dynamically scheduled exports and pseudo-ties of generating resources out of the ISO's balancing authority area. The ISO has not yet had any experience with a dynamic transfer from a generating resource since it implemented its new markets, other than the New Melones pseudo-tie that is supported by the capacity of an existing transmission contract. As a result, the ISO will have to evaluate the specifics of any proposal for the first dynamic schedule of an export and the first new pseudo-tie of a generating resource out of the ISO balancing authority area to determine the extent to which any additional functionality and processes will need to be developed to implement the particular proposal. For a pseudo-tie of a generating resource out of the ISO balancing authority area, the ISO anticipates that any necessary functionality and processes will be described in the operating agreement for the affected resource, which will be filed with the Commission for review. In recognition of this issue for dynamic exports, the ISO has included in Section 2.3.8 of the dynamic

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<sup>46</sup> Dynamic transfers final proposal at 16-21, 40; mapping table at 1; ISO board memorandum at 4, 6.

scheduling protocol in Appendix M a provision requiring that the dynamic signal for the dynamic export must be properly incorporated in the ISO's market systems.

The ISO addressed the potential need for this additional effort in the dynamic transfers final proposal, where it stated that to support dynamic exports, the ISO will need to enhance its current market software.<sup>47</sup> The implementation of the new dynamic export functionality will be subject to the timeline for development and implementation of the necessary market design and bidding modifications, which will be identified as the ISO receives specific project proposals. The discussion of specific details with the involved market participants will ensure that the ISO appropriately identifies the needed software changes.

#### **IV. Effective Date and Request for Commission Order Prior to Effective Date**

The ISO requests that the Commission make the tariff revisions contained in this filing effective as of November 1, 2011. The ISO also requests that the Commission issue an order on the tariff revisions by October 1, 2011. Issuance of a Commission order by October 1 will greatly assist the ISO by giving it sufficient time to work with owners and scheduling coordinators for resources that wish to engage in dynamic transfers to implement an orderly transition of existing resources to these new tariff provisions and to make the functionality provided by these new tariff provisions available to new resources. In particular, a Commission order issued by October 1 will provide the required certainty as to the provisions in the agreements needed for new dynamic transfers.

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<sup>47</sup> Dynamic transfers final proposal at 35.

## V. Communications

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

Nancy Saracino General Counsel Michael D. Dozier Senior Counsel John C. Anders Senior Counsel California Independent System Operator Corporation 250 Outcropping Way Folsom, CA 95630 Tel: (916)608-7048 Fax: (916) 608-7222 E-mail: <a href="mailto:mdozier@caiso.com">mdozier@caiso.com</a> <a href="mailto:janders@caiso.com">janders@caiso.com</a>	Michael Kunselman Bradley R. Miliauskas Alston & Bird LLP The Atlantic Building 950 F Street, NW Washington, DC 20004 Tel: (202) 239-3300 Fax: (202) 239-3333 E-mail: <a href="mailto:michael.kunselman@alston.com">michael.kunselman@alston.com</a> <a href="mailto:bradley.miliauskas@alston.com">bradley.miliauskas@alston.com</a>
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## VI. 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 ISO is posting this transmittal letter and all attachments on the ISO website.

## VII. Attachments

The following attachments, in addition to this transmittal letter, support the instant filing:

Attachment A	Revised ISO tariff sheets that incorporate the proposed changes described above
Attachment B	The proposed changes to the ISO tariff shown in black-line format
Attachment C	Table listing tariff changes and the sections of this transmittal letter that explain the reasons for the tariff changes
Attachment D	Dynamic transfers final proposal

Attachment E	Table showing how the provisions of the dynamic transfers final proposal have been implemented by specific tariff changes
Attachment F	List of key dates in the dynamic transfers stakeholder process
Attachment G	ISO Board memorandum and resolution

### **VIII. Conclusion**

For the foregoing reasons, the Commission should accept the proposed tariff modifications contained in the instant filing without modification. Please contact the undersigned if you have any questions regarding this matter.

Respectfully submitted,

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Counsel for the California Independent System Operator Corporation

**Attachment A - Clean Tariff**  
**Dynamic Transfer Proposal Tariff Amendment**  
**California ISO Fifth Replacement Tariff**  
**July 29, 2011**

\* \* \*

#### **4.5.1.1.6.2 Scheduling Coordinator Applicant's Obligation for Contracts**

A Scheduling Coordinator Applicant must certify that it is duly authorized to represent the Generators and Loads that are its Scheduling Coordinator Customers and must further certify that:

- (a) represented Generators have entered into Participating Generator Agreements, Qualifying Facility Participating Generator Agreements, or Pseudo-Tie Participating Generator Agreements as provided in Appendices B.2, B.3, and B.16, respectively with the CAISO;
- (b) represented UDCs have entered into UDC Operating Agreements as provided in Appendix B.8 with the CAISO;
- (c) represented CAISO Metered Entities have entered into Meter Service Agreements for CAISO Metered Entities as provided in Appendix B.6 with the CAISO;
- (d) none of the Wholesale Customers it will represent are ineligible for wholesale transmission service pursuant to the provisions of the FPA Section 212(h); and
- (e) each End-Use Customer it will represent is eligible for service as a Direct Access End User pursuant to an established program approved by the California Public Utilities Commission or a Local Regulatory Authority.

A Scheduling Coordinator Applicant that seeks to serve as Scheduling Coordinator for one or more Convergence Bidding Entities must certify that it is duly authorized to represent those Convergence Bidding Entities and to submit and settle Virtual Bids on their behalf.

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#### **4.5.4.3 Dynamic Scheduling**

##### **4.5.4.3.1 Dynamic Scheduling of Imports**

Scheduling Coordinators may submit Bids for imports of Energy and Ancillary Services for which associated Energy is delivered from Dynamic System Resources located outside of the CAISO Balancing

Authority Area, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards and any requirements of the NRC, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the Dynamic Scheduling Protocol in Appendix M or posted in standards on the CAISO Website, are satisfied, (c) the Scheduling Coordinator for the Dynamic System Resource executes a Dynamic Scheduling Agreement for Scheduling Coordinators as provided in Appendix B.5 with the CAISO for the operation of dynamic scheduling functionality, and (d) all affected Balancing Authorities each execute with the CAISO a Dynamic Scheduling Host Balancing Authority Operating Agreement as provided in Appendix B.9, or a special operating agreement particular to the operation of dynamic functionality.

#### **4.5.4.3.2 Dynamic Scheduling of Exports of Energy**

Scheduling Coordinators may submit Bids for Dynamic Schedules of exports of Energy from Generating Units located in the CAISO Balancing Authority Area, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards and any requirements of the NRC, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the Dynamic Scheduling Protocol in Appendix M or posted in standards on the CAISO Website, are satisfied, (c) the Scheduling Coordinator for the Generating Unit executes a Dynamic Scheduling Agreement for Scheduling Coordinators as provided in Appendix B.5 with the CAISO for the operation of dynamic scheduling functionality, and (d) all affected Balancing Authorities each execute with the CAISO an operating agreement particular to the operation of dynamic functionality. Scheduling Coordinators may not submit Bids for Dynamic Schedules of exports of Ancillary Services from resources located in the CAISO Balancing Authority Area, nor may Scheduling Coordinators submit Bids for Dynamic Schedules of exports from Loads located in the CAISO Balancing Authority Area.

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#### **4.6 Relationship Between CAISO And Generators**

The CAISO shall not accept Bids for any Generating Unit interconnected to the electric grid within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) otherwise than through a Scheduling Coordinator. The CAISO shall further not

be obligated to accept Bids from Scheduling Coordinators relating to Generation from any Generating Unit interconnected to the electric grid within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) unless the relevant Generator undertakes in writing, by entering into a Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Metered Subsystem Agreement with the CAISO, to comply with all applicable provisions of this CAISO Tariff as they may be amended from time to time, including, without limitation, the applicable provisions of this Section 4.6 and Section 7.7.

#### **4.6.1 General Responsibilities**

##### **4.6.1.1 Operate Pursuant to Relevant Provisions of CAISO Tariff**

Participating Generators shall operate, or cause their facilities to be operated, in accordance with the relevant provisions of this CAISO Tariff, including, but not limited to, the operating requirements for normal and emergency operating conditions specified in Section 7 and the requirements for the dispatch and testing of Ancillary Services specified in Section 8.

- (i) Each Participating Generator shall immediately inform the CAISO, through its respective Scheduling Coordinator, of any change or potential change in the current status of any Generating Units that are under the Dispatch control of the CAISO. This will include, but not be limited to, any change in status of equipment that could affect the maximum output of a Generating Unit, the minimum load of a Generating Unit, the ability of a Generating Unit to operate with automatic voltage regulation, operation of the PSSs (whether in or out of service), the availability of a Generating Unit governor, or a Generating Unit's ability to provide Ancillary Services as required. Each Participating Generator shall immediately report to the CAISO, through its Scheduling Coordinator, any actual or potential concerns or problems that it may have with respect to Generating Unit direct digital control equipment, Generating Unit voltage control equipment, or any other equipment that may impact the reliable operation of the CAISO Controlled Grid.



- (ii) In the event that a Participating Generator cannot meet its Generation schedule as specified in the Day-Ahead Schedule, or comply with a Dispatch Instruction, whether due to a Generating Unit trip or the loss of a piece of equipment causing a reduction in capacity or output, the Participating Generator shall notify the CAISO, through its Scheduling Coordinator, at once. If a Participating Generator will not be able to meet a time commitment or requires the cancellation of a Generating Unit Start-Up, it shall notify the CAISO, through its Scheduling Coordinator, at once.
- (iii) In addition to complying with the other requirements of this Section 4.6.1.1 regarding the operation of its Generating Unit, a Participating Generator with a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area shall comply with the requirements of Section 1.2.1 and related provisions of the Pseudo-Tie Protocol in Appendix N.

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#### **4.15 Relationships between CAISO and Pseudo-Ties to CAISO**

A Generator that desires a Pseudo-Tie of its Generating Unit from a Native Balancing Authority Area to the CAISO Balancing Authority Area shall comply with the applicable provisions of the Pseudo-Tie Protocol in Appendix N in addition to all provisions of this CAISO Tariff applicable to Participating Generators, except as expressly provided, including that it shall be required to enter into a Pseudo-Tie Participating Generator Agreement with the CAISO rather than a Participating Generator Agreement.

#### **4.16 Relationships between CAISO and Pseudo-Ties Out**

A Pseudo-Tie of the output of a generating unit out of the CAISO Balancing Authority Area to an Attaining Balancing Authority Area shall comply with the applicable provisions of the Pseudo-Tie Protocol in Appendix N, including being the subject of a special operating agreement with the CAISO.

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**6.5.5.1.1** Every fifteen (15) minutes, the CAISO will communicate via the secure communication system Start-Up and Shut-Down Instructions and Real-Time AS Awards to internal resources (which include Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area).

\* \* \*

## **7.2 Operating Reliability Criteria**

The CAISO shall exercise Operational Control over the CAISO Controlled Grid in compliance with all Applicable Reliability Criteria and Operating Procedures. The North American Electric Reliability Corporation's (NERC) Qualified Path Unscheduled Flow Relief for the Western Electricity Coordinating Council (WECC), Reliability Standard WECC-IRO-STD-006-0 filed by NERC in FERC Docket No. RR07-11-000 on March 26, 2007, and approved by FERC on June 8, 2007, and any amendments thereto, are hereby incorporated and made part of this CAISO Tariff. See [www.nerc.com](http://www.nerc.com) for the current version of the NERC's Qualified Path Unscheduled Flow Relief Procedures for WECC.

\* \* \*

## **8.1 Scope**

The CAISO shall be responsible for ensuring that there are sufficient Ancillary Services available to maintain the reliability of the CAISO Controlled Grid consistent with NERC and WECC reliability standards and any requirements of the NRC. The CAISO's Ancillary Services requirements may be self-provided by Scheduling Coordinators as further provided in the Business Practice Manuals. Those Ancillary Services which the CAISO requires to be available but which are not being self-provided will be competitively procured by the CAISO from Scheduling Coordinators in the Day-Ahead Market, the HASP, and the RTM consistent with Section 8.3. The provision of Ancillary Services from the Interties with interconnected Balancing Authority Areas is limited to Ancillary Services bid into the competitive procurement processes in the IFM, HASP, and RTM. The CAISO will not accept Submissions to Self-Provide Ancillary Services that are imports to the CAISO Balancing Authority Area over the Interties with interconnected Balancing Authority Areas, except from Dynamic System Resources certified to provide Ancillary Services or if provided pursuant to ETCs, TORs or Converted Rights. The CAISO will accept Submissions to Self-Provide Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area if they are certified to provide Ancillary Services. The CAISO will calculate

payments for Ancillary Services supplied by Scheduling Coordinators and charge the cost of Ancillary Services to Scheduling Coordinators based on their Ancillary Service Obligations.

For purposes of this CAISO Tariff, Ancillary Services are: (i) Regulation Up and Regulation Down, (ii) Spinning Reserve, (iii) Non-Spinning Reserve, (iv) Voltage Support, and (v) Black Start capability.

These services will be procured as stated in Section 8.3.5. Bids for these services may be submitted by a Scheduling Coordinator for resources that are capable of providing the specific service and that meet applicable Ancillary Service standards and technical requirements, as set forth in Sections 8.1 through 8.4, and are certified by the CAISO to provide Ancillary Services. Identification of specific services in this CAISO Tariff shall not preclude development of additional interconnected operation services over time. The CAISO and Market Participants will seek to develop additional categories of these unbundled services over time as the operation of the CAISO Controlled Grid matures or as required by regulatory authorities.

\* \* \*

### **8.2.3.3 Voltage Support**

The CAISO shall determine on an hourly basis for each day the quantity and location of Voltage Support required to maintain voltage levels and reactive margins within NERC and WECC reliability standards and any requirements of the NRC using a power flow study based on the quantity and location of scheduled Demand. The CAISO shall issue daily voltage schedules (Dispatch Instructions) to Participating Generators, Participating TOs and UDCs, which are required to be maintained for CAISO Controlled Grid reliability. All other Generating Units shall comply with the power factor requirements set forth in contractual arrangements in effect on the CAISO Operations Date, or, if no such contractual arrangements exist and the Generating Unit exists within the system of a Participating TO, the power factor requirements applicable under the Participating TO's TO Tariff or other tariff on file with the FERC. All Participating Generators that operate Asynchronous Generating Facilities subject to the Large Generator Interconnection Agreement set forth in Appendix BB or CC shall maintain the CAISO specified voltage schedule for those facilities at the Point of Interconnection to the extent possible, except as permitted under Appendix H of the Large Generator Interconnection Agreement, while operating within

the power factor range specified in their interconnection agreements. For all other Generating Units, Participating Generators shall maintain the CAISO specified voltage schedule at the Generating Unit terminals to the extent possible, while operating within the power factor range specified in their interconnection agreements, or, for Regulatory Must-Take Generation, Regulatory Must-Run Generation and Reliability Must-Run Generation, consistent with existing obligations. For Generating Units that do not operate under one of these agreements, the minimum power factor range will be within a band of 0.90 lag (producing VARs) and 0.95 lead (absorbing VARs) power factors. Participating Generators with Generating Units existing at the CAISO Operations Date that are unable to meet this operating power factor requirement may apply to the CAISO for an exemption. Prior to granting such an exemption, the CAISO shall require the Participating TO, UDC, or other utility to whose system the relevant Generating Units are interconnected to notify it of the existing contractual requirements for Voltage Support established prior to the CAISO Operations Date for such Generating Units. Such requirements may be contained in CPUC Electric Rule 21 or the Interconnection Agreement with the Participating TO, UDC, or other utility. The CAISO shall not grant any exemption under this Section from such existing contractual requirements. The CAISO shall be entitled to instruct Participating Generators to operate their Generating Units at specified points within their power factor ranges. Participating Generators shall receive no compensation for operating within these specified ranges.

If the CAISO requires additional Voltage Support, it shall procure this either through Reliability Must-Run Contracts or, if no other more economic sources are available, by instructing a Generating Unit to move its MVar output outside its mandatory range. Only if the Generating Unit must reduce its MW output in order to comply with such an instruction will it be eligible to recover its opportunity cost in accordance with Section 11.10.1.4.

All Loads directly connected to the CAISO Controlled Grid shall maintain reactive flow at grid interface points within a specified power factor band of 0.97 lag to 0.99 lead. Loads shall not be compensated for the service of maintaining the power factor at required levels within the bandwidth. A UDC interconnecting with the CAISO Controlled Grid at any point other than a Scheduling Point shall be subject to the same power factor requirement.

The CAISO will establish voltage control standards with UDCs and the operators of other Balancing Authority Areas and will enter into operational agreements providing for the coordination of actions in the event of a voltage problem occurring.

\* \* \*

### **8.3.1 Procurement Of Ancillary Services**

The CAISO shall operate a competitive Day-Ahead Market, HASP, and Real-Time Markets to procure Ancillary Services. The Security Constrained Unit Commitment (SCUC) and Security Constrained Economic Dispatch (SCED) applications used in the Integrated Forward Market (IFM), HASP, and the Real-Time Market (RTM) shall calculate optimal resource commitment, Energy, and Ancillary Services Awards and Schedules at least cost to End-Use Customers consistent with maintaining System Reliability. Any Scheduling Coordinator representing resources, System Units, Participating Loads, Proxy Demand Resources or imports of System Resources may submit Bids into the CAISO's Ancillary Services markets provided that it is in possession of a current certificate for the resources concerned. Regulation Up, Regulation Down, and Operating Reserves necessary to meet CAISO requirements not met by self-provision will be procured by the CAISO as described in this CAISO Tariff. The amount of Ancillary Services procured in the IFM is based on the CAISO Forecast of CAISO Demand and the forecasted intertie schedules in HASP for the Operating Hour net of (i) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services and (ii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of additional Ancillary Services procured in the HASP is based on the CAISO Forecast of CAISO Demand, the Day-Ahead Schedules established net interchange, and the forecast of the Intertie Schedules for the Operating Hour in the HASP net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, and (iii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of Ancillary Services procured in the Real-Time Market is based upon the CAISO Forecast of CAISO Demand and the HASP Intertie Schedule established net

interchange for the Operating Hour net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, (iii) additional Operating Reserves procured in HASP, and (iv) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right.

The CAISO will manage the Energy from both CAISO procured and Self-Provided Ancillary Services as part of the Real-Time Dispatch. In the Day-Ahead Market, the CAISO procures one-hundred (100) percent of its Ancillary Service requirements based on the Day-Ahead Demand Forecast net of Self-Provided Ancillary Services. After the Day-Ahead Market, the CAISO procures additional Ancillary Services needed to meet system requirements from all resources in the Real-Time Market. The amount of Ancillary Services procured in the HASP and Real-Time Market is based on the CAISO Forecast of CAISO Demand for the Operating Hour net of Self-Provided Ancillary Services.

The CAISO procurement of Ancillary Services from Non-Dynamic System Resources in the HASP is for the entire next Operating Hour. The CAISO procurement of Ancillary Services from all other resources in the Real-Time Market is for a fifteen (15) minute time period to which the relevant RTUC applies. The CAISO's procurement of Ancillary Services from Non-Dynamic System Resources in HASP and from Dynamic System Resources and internal Generation (which includes Generation from Generating Units that are Pseudo-Ties to the CAISO Balancing Authority Area) in the Real-Time Market is based on the Ancillary Service Bids submitted or generated in the HASP consistent with the requirements in Section 30. The CAISO may also procure Ancillary Services pursuant to the requirements in Section 42.1 and as permitted under the terms and conditions of a Reliability Must-Run Contract.

The CAISO will contract for long-term Voltage Support service with owners of Reliability Must-Run Units under Reliability Must-Run Contracts. The CAISO will procure Black Start capability through individual contracts with Scheduling Coordinators for Reliability Must-Run Units and other Generating Units which have Black Start capability. These requirements and standards apply to all Ancillary Services whether self-provided or procured by the CAISO.

### **8.3.2 Procurement from Internal And External Resources**

The CAISO will procure Spinning Reserves and Non-Spinning Reserves from resources operating within the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and from imports of System Resources. Scheduling Coordinators are allowed to bid Regulation from resources located outside the CAISO Balancing Authority Area by dynamically scheduling such System Resources certified to provide Regulation. Each System Resource used to bid Regulation must comply with the Dynamic Scheduling Protocol in Appendix M. Scheduling Coordinators may submit Bids for Operating Reserves from Non-Dynamic System Resources but they may not submit Bids for Regulation from such resources because these resources cannot be dynamically scheduled consistent with Appendix M. When bidding to supply Ancillary Services in the IFM, HASP, or RTM, imports and Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area compete for use of Intertie transmission capacity when the requested use is in the same direction, e.g., imports of Ancillary Services and Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area compete with Energy on Interties in the import direction, and exports of Ancillary Services (i.e., on demand obligations) compete with Energy on Interties in the export direction. To the extent there is Congestion, imports of Ancillary Services and suppliers of Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area will pay Congestion costs in the IFM, HASP, and RTM markets pursuant to Section 11.

### **8.3.4 Certification And Testing Requirements**

The owner of and Scheduling Coordinator for each resource 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 resource 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 M. Spinning Reserve may be provided only from resources that 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 resources that have been certified and tested by the CAISO using the process defined in Part C of Appendix K. Voltage Support may only be provided from resources that have been certified and tested by the CAISO using the process defined in Part D of Appendix K. Black Start capability may only be provided from Generating Units that have been certified and tested by the CAISO using the process defined in Part E of Appendix K. CAISO certification to provide Ancillary Services may be revoked by the CAISO under the provisions of this CAISO Tariff, including Appendix K.

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### **8.3.7 AS Bidding Requirements**

Scheduling Coordinators may submit Bids or Submissions to Self-Provide an Ancillary Service consistent with the rules specified in Section 30 and any further requirements in this Section 8.3.7. Scheduling Coordinators may (i) submit Bids or Submissions to Self-Provide an Ancillary Service from resources located within the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) or Dynamic System Resources certified to provide Ancillary Services, (ii) submit Submissions to Self-Provide an Ancillary Service from System Resources located outside the CAISO Balancing Authority Area if provided pursuant to ETCs, TORs, or Converted Rights, (iii) submit Bids for Ancillary Services from Dynamic and Non-Dynamic System Resources located outside the CAISO Balancing Authority Area certified to provide Ancillary Services, or (iv) submit Inter-SC Trades of Ancillary Services. Ancillary Services procured in the IFM and in the Real-Time Market are comprised of the following: Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve. The HASP process evaluates the need for Energy, Regulation and Operating Reserves from System Resources and internal resources (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and issues binding Ancillary Services awards only for Operating Reserves Ancillary Services from Non-Dynamic System Resources. Each resource for which a Scheduling Coordinator wishes to submit Ancillary Service Bids must meet the requirements set forth in this CAISO Tariff. The same resource capacity may be simultaneously offered to the same CAISO Market for multiple Ancillary Services types. Ancillary Services Bids and Submissions to Self-Provide an Ancillary Service can be submitted up to seven (7) days in advance. The CAISO will only use Operating Reserve Ramp Rates for procuring capacity associated with the specific Ancillary Services. The CAISO will issue



Real-Time Dispatch Instructions in the Real-Time Market for the Energy associated with the awarded capacity based upon the applicable Operational Ramp Rate submitted with the single Energy Bid Curve in accordance with Section 30.7.7. There is no ability to procure Ancillary Services for export.

To the extent a Scheduling Coordinator has an on-demand obligation to serve loads outside the CAISO Balancing Authority Area, it can do so provided that (1) it is using export transmission capacity available in Real-Time, and (2) the resource capacity providing Energy to satisfy the on-demand obligation is not under an RMR Contract or Resource Adequacy Capacity obligation, and has not been paid a RUC Availability Payment for the Trading Hour. All resources subject to the Ancillary Services must offer requirements, as specified in Section 40.6, must submit Bids consistent with the requirements specified therein and in Section 30.

#### **8.3.7.1 Requirement for Imports of Spinning or Non-Spinning Reserves**

Scheduling Coordinators may submit Bids for imports of Spinning Reserve or Non-Spinning Reserve from System Resources located outside the CAISO Balancing Authority Area, including Dynamic System Resources, where technically feasible and consistent with NERC and WECC reliability standards and any requirements of the NRC; and provided that such Scheduling Coordinators have certified to the CAISO their ability to deliver the service to the point of interchange with the CAISO Balancing Authority Area (including with respect to their ability to make changes, or cause such changes to be made, to Interchange Schedules during any interval of a Settlement Period at the discretion of the CAISO).

#### **8.3.7.2 Requirement for Imports of Regulation**

Scheduling Coordinators may bid imports of Regulation from System Resources located outside the CAISO Balancing Authority Area, where technically feasible and consistent with NERC and WECC reliability standards and any requirements of the NRC, by dynamic scheduling; provided that the Host Balancing Authority for the Host Balancing Authority Area in which the System Resources are located has entered into an operating agreement with the CAISO particular to the operation of dynamic functionality; and provided that such Scheduling Coordinator, with the cooperation of the Host Balancing Authority for the Host Balancing Authority Area in which the resources are located, has been certified by the CAISO as to their ability to dynamically adjust Interchange Schedules based on control signals issued by the CAISO

anytime during a Settlement Period at the discretion of the CAISO. Such certification shall include a demonstration of their ability to support the dynamic Interchange of Regulation service based on CAISO control signals received on dedicated communications links (either directly or through EMS computers) for CAISO computer control and telemetry to provide this function in accordance with CAISO standards and procedures posted on the CAISO Website.

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### **9.3.6 Maintenance Outage Planning**

Each Operator shall, by not later than October 15 each year, provide the CAISO with a proposed schedule of all Maintenance Outages it wishes to undertake in the following year. The proposed schedule shall include all of the Operator's transmission facilities that comprise the CAISO Controlled Grid and Generating Units subject to a Participating Generator Agreement, QF PGA, or Pseudo-Tie Participating Generator Agreement (including its Reliability Must-Run Units). In the case of a Participating TO's transmission facilities, that proposed schedule shall be developed in consultation with the UDCs interconnected with that Participating TO's system and shall take account of each UDC's planned maintenance requirements. The nature of the information to be provided and the detailed Maintenance Outage planning procedure shall be established by the CAISO. This information shall include:

The following information is required for each Generating Unit of a Participating Generator:

- (a) the Generating Unit name and Location Code;
- (b) the MW capacity unavailable;
- (c) the scheduled start and finish date for each Outage; and
- (d) where there is a possibility of flexibility, the earliest start date and the latest finish date, along with the actual duration of the Outage once it commences.

The following information is required for each transmission facility:

- (a) the identification of the facility and location;
- (b) the nature of the proposed Maintenance Outage;
- (c) the preferred start and finish date for each Maintenance Outage; and

- (d) where there is a possibility of flexibility, the earliest start date and the latest finish date, along with the actual duration of the Outage once it commences.

Either the CAISO, pursuant to Section 9.3.7, or an Operator, subject to Section 9.3.6.11, may at any time request a change to an Approved Maintenance Outage. An Operator may, as provided in Section 9.3.6.3, schedule with the CAISO Outage Coordination Office a Maintenance Outage on its system, subject to the conditions of Sections 9.3.6.4.1, 9.3.6.8, and 9.3.6.9.

\* \* \*

#### **11.10.1.1.1 Congestion Charges for Day-Ahead Intertie Ancillary Service Awards**

Suppliers of Day-Ahead Ancillary Services Awards and qualified Self-Provided Ancillary Services over the Interties, including Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area, also are charged for Congestion if the Ancillary Service Award or the qualified Self-Provided Ancillary Service is at a congested Scheduling Point. The charge shall be equal to the Shadow Price of the applicable congested Scheduling Point multiplied by the quantity of the Ancillary Service Award or the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period; provided, however, that no such charge for Congestion will apply to any qualified Self-Provided Ancillary Service that is within the entitlement of an Existing Right, Converted Right or Transmission Ownership Right.

#### **11.10.1.2.1 Congestion Charges**

If a Scheduling Coordinator, including a Scheduling Coordinator for a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area, receives an Ancillary Services Award or provides a qualified Self-Provided Ancillary Service at a congested Scheduling Point, the CAISO will charge the Scheduling Coordinator for Congestion. The charge for Congestion at such locations is equal to the simple average of the fifteen (15) minute applicable intertie constraint Shadow Price over the applicable Trading Hour at the location of the Ancillary Service Award, multiplied by the quantity of Ancillary Services Award or the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period. No such charge for Congestion will apply when Scheduling Coordinator's HASP Ancillary Services Awards and qualified Self-Provided Ancillary Services at Scheduling Points are provided pursuant to the CAISO Tariff rules that apply to Existing Rights and Transmission Ownership Rights.

\* \* \*

#### **11.10.1.3.1 Congestion Charges for Real-Time Intertie Ancillary Service Awards from Dynamic System Resources and Pseudo-Ties**

For each Settlement Period, the suppliers of Real-Time Ancillary Services Awards, Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area, or qualified Self-Provided Ancillary Services at Scheduling Points for Dynamic System Resources shall be charged for Congestion and such charge shall be equal to the simple average of the fifteen (15) minute Shadow Prices at the applicable Scheduling Point for the applicable Trading Hour for the awarded or Self-Provided Ancillary Service multiplied by the quantity of the Ancillary Service Award for the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period; provided, however, that no such charge for Congestion will apply to any qualified Self-Provided Ancillary Service that is within the entitlements of an Existing Right or Transmission Ownership Right.

\* \* \*

#### **11.10.9.1 Rescission Undispatchable AS**

If a Scheduling Coordinator has Undispatchable Capacity that it is obligated to supply to the CAISO during a Settlement Interval, the Ancillary Service capacity payment for the amount of Energy that cannot be delivered from the Generating Unit, Participating Load, Proxy Demand Resource, System Unit or System Resource for the Settlement Interval shall be rescinded; provided, however, that to the extent an Ancillary Service procured in the IFM from a System Resource or a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area becomes Undispatchable Capacity due to an Intertie transmission derate before the Operating Hour for which it was procured, in rescinding the Ancillary Service capacity payment, the CAISO shall credit back to the Scheduling Coordinator any charge for Congestion assessed pursuant to Section 11.10.1.1.1, but at the lower of the Day-Ahead and simple average of the fifteen (15) minute Real-Time Shadow Price over the applicable Trading Hour on the corresponding Intertie.

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#### **16.5.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units

to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with CAISO Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of Existing Contracts, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, holders of Existing Rights must follow CAISO operating orders even if those operating orders directly conflict with the terms of Existing Contracts, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the HASP or Real-Time Market.

\* \* \*

#### **17.2.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with the CAISO's Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of TORs, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, to enable the CAISO to exercise its responsibilities as Balancing Authority in accordance with Applicable Reliability Criteria, holders of TORs must follow CAISO operating orders even if those operating orders directly conflict with the terms of applicable Existing Contracts or any other contracts pertaining to the TORs, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and

an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the HASP or RTM.

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#### **27.5.1.1 Base Market Model used in the CAISO Markets**

Based on the FNM the CAISO creates the Base Market Model, which is used as the basis for formulating, as described in section 27.5.6, the individual market models used in each of the CAISO Markets to establish, enforce, and manage the Transmission Constraints associated with network facilities. The Base Market Model is derived from the FNM by (1) introducing locations for modeling Intertie Schedules and (2) introducing market resources that do not currently exist in the FNM due to their size and lack of visibility. In the Base Market Model, external Balancing Authority Areas and external transmission systems are modeled to the extent necessary to support the commercial requirements of the CAISO Markets. For those portions of the FNM that are external to the CAISO Balancing Authority Area, the Base Market Model may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the market model separately from Transmission Losses within the CAISO Balancing Authority Area. As a result, the Marginal Cost of Losses in the LMPs is not affected by external losses. For portions of the Base Market Model that are external to the CAISO Balancing Authority Area, the CAISO Markets only enforce Transmission Constraints that reflect limitations of the transmission facilities and Entitlements turned over to the Operational Control of the CAISO by a Participating Transmission Owner, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. 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 Unit is

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 Base Market Model for network analysis purposes at the corresponding Generating Unit's physical interconnection point), taking into account any losses in the non-CAISO Controlled Grid leading to the point where Energy is delivered to CAISO Controlled Grid. Based on the Base Market Model, the market models used in each of the CAISO markets incorporate physical characteristics needed for determining Transmission Losses and model Transmission Constraints within the CAISO Balancing Authority Area, which are then reflected in the Day-Ahead Schedules, AS Awards and RUC Awards, HASP Intertie Schedules, Dispatch Instructions, and LMPs resulting from each CAISO Markets Process. The Dispatch, Schedule, and LMP of a Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area refer to a PNode, or Aggregated Pricing Node, if applicable, of the resource at its physical location in the external transmission systems that are modeled in the Base Market Model, subject to the modeling of Transmission Losses in the portions of the FNM and exclusion of such Transmission Losses' effects on the LMPs that are external to the CAISO Balancing Authority Area described in this Section 27.5.1.1. The LMP price thus associated with a Dynamic System Resource or Pseudo-Tie Generating Unit will be used for Settlement of Energy and will include the Marginal Cost of Congestion and Marginal Cost of Losses components of the LMP to that Dynamic System Resource or Pseudo-Tie Generating Unit point, excluding losses and congestion external to the CAISO Balancing Authority Area, in accordance with this Section 27.5.1.1. Further, in formulating the market models for the HASP, STUC, RTUC, and RTD processes, the Real-Time power flow parameters developed from the State Estimator are applied to the Base Market Model.

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### **30.7.6.2 Treatment of Ancillary Services Bids**

When Scheduling Coordinators bid into the Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve markets, they may submit Bids for the same capacity into as many of these markets as desired at the same time by providing the appropriate Bid information to the CAISO. The CAISO optimization will evaluate AS Bids simultaneously with Energy Bids. A Scheduling Coordinator may specify that its Bid applies only the markets it desires. A Scheduling Coordinator shall also have the ability to specify different capacity prices for the Spinning Reserve, Non-Spinning Reserve, and

Regulation markets. A Scheduling Coordinator providing one or more Regulation Up, Regulation Down, Spinning Reserve, or Non-Spinning Reserve services may not change the identification of the Generating Units or Proxy Demand Resources offered in the Day-Ahead Market or in the Real-Time Market for such services unless specifically approved by the CAISO (except with respect to System Units, if any, in which case Scheduling Coordinators are required to identify and disclose the resource specific information for all Generating Units, Participating Loads, and Proxy Demand Resources constituting the System Unit for which Bids and Submissions to Self-Provide Ancillary Services are submitted into the CAISO's Day-Ahead Market and Real-Time Market).

The following principles will apply in the treatment of Ancillary Services Bids in the CAISO Markets:

- (a) not differentiate between bidders for Ancillary Services and Energy other than through cost, price, effectiveness, and capability to provide the Ancillary Service or Energy, and the required locational mix of Ancillary Services;
- (b) select the bidders with most cost effective Bids for Ancillary Service capacity which meet its technical requirements, including location and operating capability to minimize the costs to users of the CAISO Controlled Grid;
- (c) evaluate the Day-Ahead Bids over the twenty-four (24) Settlement Periods of the following Trading Day along with Energy, taking into account Transmission Constraints and AS Regional Limits;
- (d) evaluate Import Bids along with Bids from internal resources (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area);
- (e) establish Real-Time Ancillary Service Awards through RTUC from imports and resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) at fifteen (15) minutes intervals to the hour of operation; and
- (f) procure sufficient Ancillary Services in the Day-Ahead and Real-Time Markets to meet its forecasted requirements.



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### **33.6 HASP Results**

The CAISO publishes the binding HASP Intertie Schedules and HASP AS Awards for System Resources, as well as HASP Advisory Schedules and HASP AS Awards for internal Generating Units (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) no later than forty-five (45) minutes prior to the Trading Hour.

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### **34.11.2 Failure To Conform To Dispatch Instructions**

In the event that, in carrying out the Dispatch Instruction, an unforeseen problem arises (relating to plant operations or equipment, personnel or the public safety), the recipient of the Dispatch Instruction must notify the CAISO or, in the case of a Generator, the relevant Scheduling Coordinator immediately. The relevant Scheduling Coordinator shall notify the CAISO of the problem immediately. If a resource is unavailable or incapable of responding to a Dispatch Instruction, or fails to respond to a Dispatch Instruction in accordance with its terms, the resource shall be considered to be non-conforming to the Dispatch Instruction unless the resource has notified the CAISO of an event that prevents it from performing its obligations within thirty (30) minutes of the onset of such event through a SLIC log entry. Notification of non-compliance via the Automated Dispatch System (ADS) will not supplant nor serve as the official notification mechanism to the CAISO. If the resource is considered to be non-conforming as described above, the Scheduling Coordinator for the resource concerned shall be subject to Uninstructed Imbalance Energy as specified in Section 11.5.2 and Uninstructed Deviation Penalties as specified in Section 11.23. This applies whether any Ancillary Services concerned are contracted or Self-Provided. For a Non-Dynamic System Resource Dispatch Instruction prior to the Trading Hour, the Scheduling Coordinator shall inform the CAISO of its ability to conform to a Dispatch Instruction via ADS. The Non-Dynamic System Resource has the option to accept, partially accept, or decline the Dispatch Instruction, but in any case must respond within the timeframe specified in a Business Practice Manual. The Non-Dynamic System Resource can change its response within the indicated timeframe. If a Non-Dynamic System Resource does not respond within the indicated timeframe, the Dispatch Instruction will be considered declined. A decline of such a Non-Dynamic System Resource for a Dispatch Instruction

received at least forty (40) minutes prior to the Trading Hour will be subject to Uninstructed Deviation Penalties as specific in Section 11.23. A decline of such a Non-Dynamic System Resource for a Dispatch Instruction received less than forty (40) minutes prior to the Trading Hour will not be subject to Uninstructed Deviation Penalties. A Non-Dynamic System Resource that only partially accepts a Dispatch Instruction is subject to Uninstructed Deviation Penalties for the portion of the Dispatch Instruction that is declined.

When a resource demonstrates that it is not following Dispatch Instructions, the RTM will no longer assume that the resource will ramp from its current output level. The RTM assumes the resource to be "non-compliant" if it is deviating its five (5)-minute Ramping capability for more than N intervals by a magnitude determined by the CAISO based on its determination that it is necessary to improve the calculation of the expected Imbalance Energy as further defined in the BPM. When a resource is identified as "non-compliant," RTM will set the Dispatch operating target for that resource equal to its actual output in the Market Clearing software such that the persistent error does not cause excessive AGC action and consequently require CAISO to take additional action to comply with reliability requirements. Such a resource will be considered to have returned to compliance when the resource's State Estimator or telemetry value (whichever is applicable) is within the above specified criteria. During the time when the resource is "non-compliant", the last applicable Dispatch target shall be communicated to the Scheduling Coordinator as the Dispatch operating target. The last applicable Dispatch target may be (i) the last Dispatch operating target within the current Trading Hour that was instructed prior to the resource becoming "non-compliant," or (ii) the Day-Ahead Schedule, or (iii) the HASP Self-Schedule depending on whether the resource submitted a Bid and the length of time the resource was "non-compliant," or (iv) for a Dynamic System Resource or a Pseudo-Tie Generating Unit that is an Eligible Intermittent Resource, the most recently available telemetry for the actual output.

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#### **40.8.1.6 Wind and Solar**

As used in this Section, wind units are those wind generating units without backup sources of Generation and solar units are those solar generating units without backup sources of Generation. Wind and solar

units, other than Qualifying Facilities with effective contracts under the Public Utility Regulatory Policies Act, must be Participating Intermittent Resources or subject to availability provisions of Section 40.6.4.3.4.

The Qualifying Capacity of all wind or solar units, including Qualifying Facilities, for each month will be based on their monthly historic performance during that same month during the hours of noon to 6:00 p.m., using a three-year rolling average. For wind or solar units with less than three years operating history, all months for which there is no historic performance data will utilize the monthly average production factor of all units (wind or solar, as applicable) within the TAC Area, or other production data from another area determined by the CAISO to be appropriate if the unit is not within a TAC Area, in which the generating unit is located.

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#### **40.8.1.12 System Resources and Pseudo-Ties**

##### **40.8.1.12.1 Dynamic System Resources and Pseudo-Ties**

Dynamic System Resources and Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area shall be treated similar to resources within the CAISO Balancing Authority Area, except with respect to the deliverability screen under Section 40.4.6.1 and with respect to the limitation on the Qualifying Capacity of wind and solar resources set forth in Section 40.8.1.6. However, eligibility as a Resource Adequacy Resource is contingent upon a showing by the Scheduling Coordinator that the Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area has secured transmission through any intervening Balancing Authority Areas for the Operating Hours that cannot be curtailed for economic reasons or bumped by higher priority transmission and that the Load Serving Entity for which the Scheduling Coordinator is submitting Demand Bids has an allocation of import capacity at the import Scheduling Point under Section 40.4.6.2 that is not less than the Resource Adequacy Capacity provided by the Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area.

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#### **40.9.4.2.1 Substitute Capacity**

A Scheduling Coordinator may substitute capacity that is not Resource Adequacy Capacity for its Resource Adequacy Capacity that is on a Forced Outage or de-rate in order to mitigate the impact of the Forced Outage or de-rate on its availability calculation. Such substitution will be accepted by the CAISO in accordance with the following procedures.

(1) For Local Capacity Area Resources. A Scheduling Coordinator providing Resource Adequacy Capacity to satisfy a Local Capacity Area requirement may pre-qualify alternate resources by providing a prequalification request in accordance with the form and schedule specified in the Business Practice Manual. If the alternate resource is located at the same bus as the Resource Adequacy Resource it would replace and has similar operational characteristics, the CAISO will approve the pre-qualification request as a substitute resource for use in the subsequent Resource Adequacy Compliance Year. Additionally, when a Local Capacity Area Resource Adequacy Resource subsequently has a Forced Outage or de-rate, the Scheduling Coordinator may, prior to the close of IFM, request to substitute a non-pre-qualified resource. The CAISO will grant the request if the alternate resource is (i) located at the same bus and meets the CAISO's operational needs, or (ii) if not located at the same bus, is located in the same Local Capacity Area, and which meets the CAISO's effectiveness and operational needs, including size of resource, as determined by the CAISO in its reasonable discretion.

(2) Non-Local Capacity Area Resources (Resource Adequacy Resources designated to meet system requirements). If a Resource Adequacy Resource that is not also a Local Capacity Area Resource has an outage that would count against its availability, the Scheduling Coordinator for that resource may, prior to the close of the IFM, request to substitute a non-Resource Adequacy Resource to be used in the place of the original resource. A Scheduling Coordinator for a non-Resource Specific System Resource that has an outage that would count against its availability may, prior to the close of the IFM, request to substitute a non-Resource Adequacy Resource that is internal to the CAISO Balancing Area Authority (which does not include a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) to be used in the place

of the original resource. The CAISO shall approve the request if the substitute resource provides the same MW quantity of deliverable capacity as the original Resource Adequacy Resource.

\* \* \*

#### **43.5.2 Obligation To Provide Capacity And Termination**

The decision to accept an CPM designation shall be voluntary for the Scheduling Coordinator for any resource. If the Scheduling Coordinator for a resource accepts an CPM designation, it shall be obligated to perform for the full quantity and full period of the designation with respect to the amount of CPM Capacity for which it has accepted an CPM designation. If a Participating Generator's or Participating Load's Eligible Capacity is designated under the CPM after the Participating Generator or Participating Load has filed notice to terminate its Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement or withdraw the Eligible Capacity from its Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement, and the Scheduling Coordinator for the resource agrees to provide service under the CPM, then the Scheduling Coordinator shall enter into a new Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement, as applicable, with the CAISO.

\* \* \*

## Appendix A

### Master Definition Supplement

\* \* \*

#### **- Attaining Balancing Authority Area**

The Balancing Authority Area where the output of a Pseudo-Tie generating unit is fully included for purposes of calculation of Area Control Error and meeting Balancing Authority Area load responsibilities.

\* \* \*

#### **- Dynamic Scheduling Host Balancing Authority Op Agreement**

An agreement entered into between the CAISO and a Host Balancing Authority governing the terms of dynamic scheduling between the Host Balancing Authority and the CAISO in accordance with the Dynamic Scheduling Protocol set forth in Appendix M, a pro forma version of which agreement is set forth in Appendix B.9.

\* \* \*

#### **- Eligible Intermittent Resource**

A Generating Unit or Dynamic System Resource 1 MW or larger subject to a Participating Generator Agreement, QF PGA, Dynamic Scheduling Agreement for Scheduling Coordinators, or Pseudo-Tie Participating Generator Agreement that is powered by wind or solar energy, except for a de minimis amount of Energy from other sources.

\* \* \*

#### **- Generating Unit**

An individual electric generator and its associated plant and apparatus whose electrical output is capable of being separately identified and metered or a Physical Scheduling Plant that, in either case, is:

- (a) located within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a generating unit to the CAISO Balancing Authority Area);
- (b) connected to the CAISO Controlled Grid, either directly or via interconnected transmission or distribution facilities or via a Pseudo-Tie; and
- (c) capable of producing and delivering net Energy (Energy in excess of a generating station's internal power requirements).

\* \* \*

**- Interruptible Imports**

Non-firm Energy sold into the CAISO Balancing Authority Area from a resource located outside the CAISO Balancing Authority Area which by contract can be interrupted or reduced at the discretion of the seller. Interruptible Imports must be submitted through Self-Schedules in the Day-Ahead Market.

\* \* \*

**- Native Balancing Authority Area**

The Balancing Authority Area where a Pseudo-Tie generating unit is physically interconnected to the electric grid.

\* \* \*

**- Node**

A point in the Full Network Model representing a physical location within the CAISO Balancing Authority Area or the CAISO Controlled Grid, which includes the Load and Generating Unit busses in the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) and at the Intertie busses between the CAISO Balancing Authority Area and interconnected Balancing Authority Areas.

\* \* \*

**- Participating Generator**

A Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the CAISO Controlled Grid (1) from a Generating Unit with a rated capacity of 1 MW or greater, (2) from a Generating Unit with a rated capacity of from 500 kW up to 1 MW for which the Generator elects to be a Participating Generator, or (3) from a Generating Unit providing Ancillary Services or submitting Energy Bids through an aggregation arrangement approved by the CAISO, which has undertaken to be bound by the terms of the CAISO Tariff, in the case of a Generator through a Participating Generator Agreement, QF PGA, or Pseudo-Tie Participating Generator Agreement.

\* \* \*

**- Pseudo-Tie**

A functionality by which the output of a generating unit physically interconnected to the electric grid in a Native Balancing Authority Area is telemetered to and deemed to be produced in an Attaining Balancing Authority Area that provides Balancing Authority services for and exercises Balancing Authority jurisdiction over the Pseudo-Tie generating unit.

**- Pseudo-Tie Participating Generator Agreement**

An agreement between the CAISO and a Participating Generator with a Pseudo-Tie Generating Unit, a pro forma version of which is set forth in Appendix B.16.

\* \* \*

**- Wheeling Out**

Except for Existing Rights exercised under an Existing Contract in accordance with Section 16.1, the use of the CAISO Controlled Grid for the transmission of Energy from a Generating Unit located within the CAISO Controlled Grid (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) to serve a Load located outside the transmission and Distribution System of a Participating TO.

\* \* \*



## Appendix B.5

### Dynamic Scheduling Agreement For SCs

**THIS AGREEMENT** is dated this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ and is entered into, by and between:

(1) **[Full Legal Name]** having its registered and principal place of business located at **[Address]** (the "Scheduling Coordinator");

and

(2) **California Independent System Operator Corporation**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way, Folsom, California 95630 (the "CAISO").

The Scheduling Coordinator and the CAISO are hereinafter referred to as the "Parties."

#### Whereas:

- A. The CAISO Tariff provides that a Scheduling Coordinator may submit Dynamic Schedules to the CAISO from System Resources.
- B. The Scheduling Coordinator is currently Scheduling Coordinator for a System Resource associated with a power plant(s) interconnected in a Balancing Authority Area other than the CAISO Balancing Authority Area (the "Host Balancing Authority Area").
- C. The Scheduling Coordinator wishes to implement and operate a dynamic functionality that allows bidding dynamically from a System Resource into the CAISO Balancing Authority Area from the Host Balancing Authority Area and, therefore, wishes to undertake to the CAISO that it will comply with the applicable provisions of the CAISO Tariff.
- D. The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Scheduling Coordinator will discharge their respective duties and responsibilities under the CAISO Tariff.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

## ARTICLE I

### DEFINITIONS AND INTERPRETATION

- 1.1 **Master Definitions Supplement.** All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement to the CAISO Tariff.
- 1.2 **Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, the CAISO Tariff will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) “includes” or “including” shall mean “including without limitation”;
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a “person” includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## **ARTICLE II**

### **ACKNOWLEDGEMENTS OF SCHEDULING COORDINATOR AND CAISO**

- 2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledges that the CAISO may not be able to satisfy fully these responsibilities if the Scheduling Coordinator fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.

## **ARTICLE III**

### **TERM AND TERMINATION**

**3.1 Effective Date.** This Agreement shall be effective as of the date set forth above, unless accepted for filing and made effective by FERC on some other date, if FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.

## **3.2 Termination**

**3.2.1 Termination by CAISO.** Subject to Section 3.2.2, the CAISO may terminate this Agreement by giving written notice of termination in the event that the CAISO's agreement with the Host Balancing Authority has terminated or the Scheduling Coordinator commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given, to the Scheduling Coordinator, written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

**3.2.2 Limitation on CAISO Termination.** Notwithstanding the provisions of Section 3.2.1, in the event of noncompliance with the provisions of the CAISO Dynamic Scheduling Protocol, set forth in Appendix M of the CAISO Tariff, the CAISO shall have the right to suspend or terminate this Agreement after three (3) instances of noncompliance. In the event that the CAISO determines that the Scheduling Coordinator has failed to comply with the CAISO Dynamic Scheduling Protocol, the CAISO will provide written notice to that effect to the Scheduling Coordinator, and the Scheduling Coordinator shall have seven (7) days to correct the non-compliant condition(s). If the CAISO determines that Scheduling Coordinator has not corrected the non-compliant condition(s) within seven (7) days after the third notice of noncompliance, the CAISO may, by further written notice to the Scheduling Coordinator, suspend or terminate this Agreement and the existing functionality and arrangements described herein pursuant to Section 3.2.1, but without providing for the additional thirty (30)-day cure period otherwise provided in Section 3.2.1.

**3.2.3 Termination by Scheduling Coordinator.** In the event that the Scheduling Coordinator no longer wishes to submit dynamic Bids to the CAISO, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days written notice. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or upon ninety (90) days after the CAISO's receipt of the Scheduling

Coordinator's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## ARTICLE IV

### GENERAL TERMS AND CONDITIONS

#### 4.1 Dynamic Scheduling Requirements and Obligations

- 4.1.1** The dynamic functionality established under this Agreement shall be implemented and operated in accordance with CAISO Tariff Section 4.5.4.3, other applicable provisions of the CAISO Tariff, all applicable NERC and WECC policies, requirements, and provisions, and the CAISO Dynamic Scheduling Protocol.
- 4.1.2** The maximum allowable dynamic power transfer (in MW) from the Scheduling Coordinator's System Resource(s) and from the generating resources from which it intends to dynamically schedule exports shall be as set forth in Schedule 1 and will be referred to as "PMax" in all CAISO scheduling and control systems.
- 4.1.3** The Scheduling Coordinator warrants that the power plant(s) listed in Schedule 1 is interconnected within the Host Balancing Authority Area specified in Schedule 1, placing both the plant(s) as well as the associated System Resource under the operational jurisdiction of the Host Balancing Authority.
- 4.1.4** The CAISO Interties associated with the System Resource(s) and the generating resources from which it intends to dynamically schedule exports are set forth in Schedule 1. The Scheduling Coordinator may request, and the CAISO may agree, at its sole discretion, to change the foregoing CAISO Intertie association, subject to any limitations set forth in the CAISO Dynamic Scheduling Protocol.
- 4.1.5** Dynamic functionalities implemented between the CAISO and the Scheduling Coordinator may provide for imports from the System Resource(s) listed in Schedule 1 to the CAISO Balancing Authority Area or for exports from generating resources listed in Schedule 1 from the CAISO Balancing Authority Area.
- 4.1.6 Identification of System Resources.** The Scheduling Coordinator has identified the System Resources and the generating resources from which it intends to dynamically schedule exports that it represents in Schedule 1.
- 4.1.7 Notification of Changes.** Sixty (60) days prior to changing any technical information in Schedule 1, the Scheduling Coordinator shall notify the CAISO of the proposed changes. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics provided in the revised Schedule 1. Unless the Scheduling Coordinator fails to test at the values in the proposed change(s), the change will become effective upon the effective date for the next scheduled update of the CAISO's Master File, provided the Scheduling Coordinator submits the changed information by the applicable deadline and is tested by the deadline.
- 4.2 Agreement Subject to CAISO Tariff.** The Parties will comply with all applicable provisions of the CAISO Tariff, including Sections 4.5.4.3 and 8.4.5 and the Dynamic Scheduling Protocol in

Appendix M. This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.

#### **4.3 Obligations Relating to Ancillary Services**

- 4.3.1 Submission of Bids.** When the Scheduling Coordinator submits a Bid for Ancillary Services, the Scheduling Coordinator will, by the operation of this Section 4.3.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.

### **ARTICLE V**

#### **PENALTIES AND SANCTIONS**

- 5.1 Uninstructed Deviations.** Deviations from Dynamic Schedules of Energy will also be subject to Uninstructed Deviation Penalties pursuant to Section 11.23 and related provisions of the CAISO Tariff.
- 5.2 General.** The Scheduling Coordinator shall be subject to all penalties made applicable to dynamic imports from System Resources set forth in the CAISO Tariff.

### **ARTICLE VI**

#### **COSTS**

- 6.1 Operating and Maintenance Costs.** The Scheduling Coordinator shall be responsible for all its costs incurred in connection with dynamic scheduling and compliance by the System Resources and the generating resources from which it intends to dynamically schedule exports identified in Schedule 1 for the purpose of meeting its obligations under this Agreement.

### **ARTICLE VII**

#### **DISPUTE RESOLUTION**

- 7.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

### **ARTICLE VIII**

#### **REPRESENTATIONS AND WARRANTIES**

- 8.1 Representation and Warranties.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.

## ARTICLE IX

### LIABILITY

- 9.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE X

### UNCONTROLLABLE FORCES

- 10.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE XI

### MISCELLANEOUS

- 11.1 Assignments.** Either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.
- 11.2 Notices.** Any notice, demand or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.

- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.
- 11.8 [NOT USED]**
- 11.9 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Scheduling Coordinator shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.
- 11.10 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**NAME OF SCHEDULING COORDINATOR**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_



## **SCHEDULE 1**

### **SYSTEM RESOURCES AND BALANCING AUTHORITY AREA INFORMATION**

**[Sections 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.7]**

**Description of System Resource(s), including Associated Power Plants and PMax Values, for Dynamic Imports to the CAISO Balancing Authority Area:**

**CAISO Intertie:**

**Host Balancing Authority Area:**

**Intermediary Balancing Authority Areas:**

**Description of Generating Resource(s), including Associated Power Plants and PMax Values, for Dynamic Exports from the CAISO Balancing Authority Area:**

**CAISO Intertie:**

**Receiving Balancing Authority Area:**

**Intermediary Balancing Authority Areas:**

**SCHEDULE 2**

**NOTICES**

**[Section 11.2]**

**Scheduling Coordinator**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

\* \* \*

## Appendix B.9

### DSHBA Operating Agreement (DSHBAOA)

#### THIS DYNAMIC SCHEDULING HOST BALANCING AUTHORITY OPERATING AGREEMENT

(“AGREEMENT”) is established this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_ and is accepted by and between:

**[Full legal name]** (“Host Balancing Authority”), having its registered and principal executive office at [address],

and

**California Independent System Operator Corporation** (“CAISO”), a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way, Folsom, California 95630.

The Host Balancing Authority and the CAISO are hereinafter referred to as the “Parties.”

#### Whereas:

- A. The Parties named above operate Balancing Authority Areas.
- B. The Parties wish to coordinate operation of dynamic scheduling functionality to satisfy North American Electric Reliability Corporation (“NERC”) and Western Electricity Coordinating Council (“WECC”) standards and criteria and Good Utility Practice.
- C. The Host Balancing Authority desires to implement an agreement to facilitate dynamic scheduling from System Resources in its Balancing Authority Area to the CAISO Balancing Authority Area.
- D. The Parties wish to enter into this Agreement to establish the terms and conditions for the operation of the dynamic scheduling functionality from Host Balancing Authority’s Balancing Authority Area to the CAISO Balancing Authority Area.
- E. The CAISO has certain statutory obligations under California law to maintain power system reliability.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

#### 1. Term and Termination

##### 1.1 Effective Date

This Agreement shall be effective as of the date set forth above, unless this Agreement is accepted for filing and made effective by the Federal Energy Regulatory Commission (“FERC”) on some other date, if FERC filing is required, and shall continue in effect until terminated.

##### 1.2 Termination

This Agreement may be terminated by either Party upon thirty (30) days written notice to the other Party or upon mutual consent of both Parties. For entities subject to FERC jurisdiction, termination will be effective upon acceptance by FERC of notice of termination, if this Agreement has been filed with FERC, or thirty (30) days after the date of the notice of termination by a Party, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders. The CAISO shall timely file any required notice of termination with FERC. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination with FERC within sixty (60) days after issuance of the notice of termination by a Party; or (2) the CAISO files the notice of termination with FERC in accordance with the requirements of FERC Order No. 2001.

## **2. Definitions**

### **2.1 WECC Definitions**

Except as defined below, terms and expressions used in this Agreement shall have the same meanings as those contained in the WECC Glossary of WECC Terms and Acronyms.

### **2.2 Specific Definitions**

**2.2.1 CAISO Dynamic Scheduling Protocol:** The CAISO's Dynamic Scheduling Protocol, which is set forth in Appendix M of the CAISO Tariff.

**2.2.2 CAISO Tariff:** CAISO Operating Agreement, Protocols, and Tariff as amended from time to time, together with any appendices or attachments thereto.

**2.2.3 Good Utility Practice:** Any of the practices, methods, and acts engaged in or approved by a significant portion of the electric utility industry in the WECC region during the relevant time period, or any of the practices, methods, and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. Good Utility Practice is not intended to be any one of a number of the optimum practices, methods, or acts to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

**2.2.4 Point of Contact:** A person or entity having the authority to receive and act upon scheduling or dispatch communications from the other Balancing Authority and available through a communications device mutually agreed upon on a 24-hour, 7-day basis.

**2.2.5 Scheduling Coordinator:** An entity certified by the CAISO for the purposes of undertaking the functions of: submitting bids or schedules for energy, generation, transmission losses, and ancillary services; coordinating generation; tracking, billing, and settling trades with other Scheduling Coordinators; submitting forecast information; paying the CAISO's charges; and ensuring compliance with CAISO protocols.

**2.2.6 System Resource:** "System Resource" is defined in the CAISO Tariff and, in the context of this Agreement, may include combinations of resources as described in the CAISO Dynamic Scheduling Protocol.

### **3 General**

#### **3.1 Purpose**

This Agreement sets forth the requirements that must be satisfied by the Host Balancing Authority should it elect to support Scheduling Coordinators' requests for implementation of a dynamic scheduling functionality and delivery of energy and energy associated with ancillary services (except regulation service) into the CAISO Balancing Authority Area. The requirements encompass technical (energy management system ("EMS"), automatic generation control ("AGC"), and communications), interchange scheduling, telemetry, and aspects of Balancing Authority Area operations.

#### **3.2 NERC/WECC Operating Standards Observed**

Nothing in this Agreement is intended to change, supersede, or alter either Party's obligations to abide by NERC and WECC reliability standards and policies and WECC criteria.

#### **3.3 Applicable Standards**

This Agreement incorporates, by reference, the CAISO Dynamic Scheduling Protocol.

#### **3.4 Communication**

The CAISO and the Host Balancing Authority shall each operate and maintain a 24-hour, 7-day control center with real-time scheduling and control functions. Appropriate control center staff will be provided by each Party who shall be responsible for operational communications and who shall have sufficient authority to commit and bind that Party. The CAISO and the Host Balancing Authority shall jointly develop communication procedures necessary to support scheduling and dispatch functions. The Parties agree to exchange operational contact information in a format to be provided by the CAISO and completed as of the effective date of this Agreement. Each Party shall provide the other Party ten (10) calendar days advance notice of updates to its operational contact information is expected to change.

### **4. Telecommunications Requirements**

The CAISO and Host Balancing Authority shall establish and maintain real-time, redundant, diversely routed, communications links between the CAISO EMS and the Host Balancing Authority EMS, with the primary link utilizing the standard inter-control center communications protocol ("ICCP") in accordance with the CAISO Dynamic Scheduling Protocol for the dynamically scheduled System Resources listed in Schedule 2.

### **5. Telemetry**

For each operating hour for which a System Resource is scheduled to deliver energy, and/or energy associated with any of the non-regulating ancillary services to the CAISO Balancing Authority Area, the Host Balancing Authority shall provide, via the ICCP communication links to the CAISO EMS, the data for each System Resource, as set forth in the CAISO Dynamic Scheduling Protocol.

### **6. Interchange Scheduling Requirements**

## **6.1 Dynamic Scheduling**

The Host Balancing Authority shall support Scheduling Coordinators' requests to arrange dynamic interchange schedules for the delivery of energy to the CAISO Balancing Authority Area, reflecting the System Resource's instantaneous energy production or allocation level and taking into account available transmission capacity.

## **6.2 Treatment of Area Control Error ("ACE")**

The Host Balancing Authority shall instantaneously compensate its AGC for the System Resource's energy output that is generated or allocated for establishing the dynamic schedule to the CAISO such that the System Resource energy production or allocation changes have an equal in magnitude and opposite in sign effect on the Host Balancing Authority's ACE.

## **6.3 Integration of Dynamic Scheduling**

For each operating hour during which energy was dynamically scheduled for delivery to the CAISO Balancing Authority Area, the Host Balancing Authority shall compute an integrated amount of interchange based on the System Resource's integrated energy production, by integrating the instantaneous System Resource production levels. Such integrated MWH value shall be agreed to hourly by the real-time schedulers.

## **6.4 Delivery of Megawatts ("MW")**

The CAISO and the Host Balancing Authority will share in the real time deviations from the dynamic, non-regulation ancillary services and energy from the dynamic System Resource, for which the CAISO's maximum responsibility will be on a pro rata basis. The Host Balancing Authority will remain responsible for regulation obligation for the portion of the System Resource's output not dynamically scheduled into the CAISO Balancing Authority Area in accordance with WECC and NERC reliability standards.

## **6.5 Access to Information**

The Parties agree to exchange information related to telemetry sent and received with respect to the delivery of energy (i) at the request of the other Party for purposes of after-the-fact interchange accounting or (ii) on demand for any other purpose.

## **7. Other Host Balancing Authority Responsibilities**

### **7.1 Operational Jurisdiction**

The Host Balancing Authority will have, at a minimum, the level of operational jurisdiction over the System Resource and the associated dynamic schedule that NERC and WECC vest in Host Balancing Authorities.

### **7.2 E-Tagging**

The Host Balancing Authority must support associated e-tagging as described in the CAISO Dynamic Scheduling Protocol and deemed to be consistent with NERC and/or WECC requirements.

### **7.3 Real-Time Adjustments**

The Host Balancing Authority must have a means to manually override and/or otherwise adjust the dynamic signal in real-time, if needed.

### **7.4 Coordination with Other Balancing Authorities**

The Host Balancing Authority must provide in real-time the instantaneous value of each dynamic schedule to every intermediary Balancing Authority Area through whose systems such dynamic schedule may be implemented to the CAISO.

## **8. Other**

### **8.1 Losses**

The CAISO shall not be responsible for transmission losses caused by transmitting energy dynamically within or across the Host Balancing Authority's Balancing Authority Area for delivery to the CAISO.

### **8.2 Certification**

Only CAISO-certified System Resource/Host Balancing Authority arrangements will be allowed to bid or self provide ancillary services in the CAISO's ancillary services market through a CAISO-certified Scheduling Coordinator.

### **8.3 No Guarantee of Award**

Certification of a System Resource/Host Balancing Authority arrangement allows for bidding of energy and/or certain ancillary services into the CAISO market; it does not, however, guarantee selection of such bid.

### **8.4 Performance Assessment**

The CAISO will monitor and measure dynamically imported ancillary services, whether bid or self-provided, against the performance benchmarks described in the CAISO Dynamic Scheduling Protocol.

### **8.5 Description of System Resources**

Each dynamically scheduled System Resource permitted pursuant to this Agreement is described in Schedule 2.

## **9. Notifications**

The CAISO and the Host Balancing Authority shall jointly develop methods for coordinating the notification of all affected scheduling entities within their respective Balancing Authority Areas regarding schedule changes in emergency or curtailment conditions.

## **10 Liability**



## **10.1 Uncontrollable Forces**

An Uncontrollable Force means any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm, flood, earthquake, explosion, any curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond the reasonable control of a Balancing Authority which could not be avoided through the exercise of Good Utility Practice.

Neither the CAISO nor the Host Balancing Authority will be considered in default of any obligation under this Agreement or liable to the other for direct, indirect, and consequential damages if prevented from fulfilling that obligation due to the occurrence of an Uncontrollable Force. Neither the CAISO nor the Host Balancing Authority will be considered in default of any obligation under this Agreement to the extent caused by any act, or failure to act, of any intermediary Balancing Authority.

In the event of the occurrence of an Uncontrollable Force, which prevents either the CAISO or the Host Balancing Authority from performing any obligations under this Agreement, the affected entity shall not be entitled to suspend performance of its obligations in any greater scope or for any longer duration than is required by the Uncontrollable Force. The CAISO and the Host Balancing Authority shall each use its best efforts to mitigate the effects of such Uncontrollable Force, remedy its inability to perform, and resume full performance of its obligations hereunder.

## **10.2 Liability To Third Parties**

Except as otherwise expressly provided herein, nothing in this Agreement shall be construed or deemed to confer any right or benefit on, or to create any duty to, or standard of care with reference to any third party, or any liability or obligation, contractual or otherwise, on the part of CAISO or the Host Balancing Authority.

## **10.3 Liability Between the Parties**

The Parties' duties and standard of care with respect to each other, and the benefits and rights conferred on each other, shall be no greater than as explicitly stated herein. Neither Party, its directors, officers, employees, or agents, shall be liable to the other Party for any loss, damage, claim, cost, charge, or expense, whether direct, indirect, or consequential, arising from the Party's performance or nonperformance under this Agreement, except for a Party's gross negligence, or willful misconduct.

## **11 Miscellaneous**

### **11.1 Assignments**

Either Party to this Agreement may assign its obligations under this Agreement, with the other Party's prior written consent. Such consent shall not be unreasonably withheld.

Obligations and liabilities under this Agreement shall be binding on the successors and assigns of the Parties. No assignment of this Agreement shall relieve the assigning Party from any obligation or liability under this Agreement arising or accruing prior to the date of assignment.

### **11.2 Notices**

Any notice, demand, or request which may be given to or made upon either Party regarding this Agreement shall be made in writing and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 3 and shall be deemed properly served, given, or made: (a) upon delivery if delivered in person, (b) five (5) days after deposit in the mail if sent by first class United States mail, postage prepaid, (c) upon receipt of confirmation by return facsimile if sent by facsimile, or (d) upon delivery if delivered by prepaid commercial courier service. A Party must update the information in Schedule 3 relating to its address as that information changes. Such changes shall not constitute an amendment to this Agreement.

### **11.3 Waivers**

Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or matter arising in connection with this Agreement. Any delay short of the statutory period of limitations, in asserting or enforcing any right under this Agreement, shall not constitute or be deemed a waiver of such right.

### **11.4 Governing Law and Forum**

Subject to Section 11.5, this Agreement shall be deemed to be a contract made under and for all purposes shall be governed by and construed in accordance with the laws of the State of California. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement shall be brought in any of the following forums, as appropriate: a court of the State of California or any federal court of the United States of America located in the State of California or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission. No provision of this Agreement shall be deemed to waive the right of any Party to protest, or challenge in any manner, whether this Agreement, or any action or proceeding arising under or relating to this Agreement, is subject to the jurisdiction of the Federal Energy Regulatory Commission.

### **11.5 Consistency with Federal Laws and Regulations**

(a) Nothing in this Agreement shall compel any person or federal entity to: (1) violate federal statutes or regulations; or (2) in the case of a federal agency, to exceed its statutory authority, as defined by any applicable federal statutes, regulations, or orders lawfully promulgated thereunder. If any provision of this Agreement is inconsistent with any obligation imposed on any person or federal entity by federal law or regulation to that extent, it shall be inapplicable to that person or federal entity. No person or federal entity shall incur any liability by failing to comply with any provision of this Agreement that is inapplicable to it by reason of being inconsistent with any federal statutes, regulations, or orders lawfully promulgated thereunder; provided, however, that such person or federal entity shall use its best efforts to comply with the CAISO Tariff to the extent that applicable federal laws, regulations, and orders lawfully promulgated thereunder permit it to do so.

(b) If any provision of this Agreement requiring any person or federal entity to give an indemnity or impose a sanction on any person is unenforceable against a federal entity, the CAISO shall submit to the Secretary of Energy or other appropriate Departmental Secretary a report of any circumstances that would, but for this provision, have rendered a federal entity liable to indemnify any person or incur a sanction and may request the Secretary of Energy or other appropriate Departmental Secretary to take such steps as are necessary to give effect to any provisions of this Agreement that are not enforceable against the federal entity.

## **11.6 Severability**

If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

## **11.7 Section Headings**

Section headings provided in this Agreement are for ease of reading and are not meant to interpret the text in each Section.

## **11.8 Amendments**

This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that are subject to FERC approval shall not take effect until FERC has accepted such amendments for filing and has made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO or the Host Balancing Authority to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

## **11.9 Counterparts**

This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date first written above.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**[Full legal name of Host Balancing Authority]**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**SCHEDULE 1**

**[NOT USED]**

**SCHEDULE 2**

**DESCRIPTION OF DYNAMICALLY SCHEDULED SYSTEM RESOURCES**

**[Section 4]**

**SCHEDULE 3**

**NOTICES**

**[Section 11.2]**

**Host Balancing Authority**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

\* \* \*



**B.16**

**Pseudo-Tie Participating Generator Agreement**

**THIS AGREEMENT** is dated this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_ and is entered into, by and between:

(1) **[Full Legal Name]** having its registered and principal place of business located at **[Address]** (the "Participating Generator");

and

(2) **California Independent System Operator Corporation**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way, Folsom, California 95630 (the "CAISO").

The Participating Generator and the CAISO are hereinafter referred to as the "Parties."

**Whereas:**

- A.** The CAISO Tariff provides that the CAISO shall not accept Bids for Energy or Ancillary Services generated by any Generating Unit otherwise than through a Scheduling Coordinator.
- B.** The CAISO Tariff further provides that the CAISO shall not be obliged to accept Bids relating to Generation from any Generating Unit unless the relevant Generator undertakes in writing to the CAISO to comply with all applicable provisions of the CAISO Tariff.
- C.** The Participating Generator owns a Generating Unit physically interconnected in a Native Balancing Authority Area other than the CAISO Balancing Authority Area.
- D.** The Participating Generator and the CAISO wish to implement and operate a Pseudo-Tie for the Generating Unit to allow the Participating Generator to submit Self-Schedules and Bids for Energy and Ancillary Services to the CAISO through a Scheduling Coordinator dynamically from the Pseudo-Tie into the CAISO Balancing Authority Area from the Native Balancing Authority Area.
- E.** The Participating Generator wishes to undertake to the CAISO that it will comply with the applicable provisions of the CAISO Tariff that are applicable to a Participating Generator with a Pseudo-Tie.
- F.** The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Participating Generator will discharge their respective duties and responsibilities under the CAISO Tariff.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

**ARTICLE I  
DEFINITIONS AND INTERPRETATION**

**1.1 Master Definitions Supplement.** All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement to the CAISO Tariff.

**1.2 Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, this Agreement will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) "includes" or "including" shall mean "including without limitation";
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a "person" includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## **ARTICLE II ACKNOWLEDGEMENTS OF PARTICIPATING GENERATOR AND CAISO**

**2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid and the CAISO Balancing Authority Area consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledges that the CAISO may not be able to satisfy fully these responsibilities if the Participating Generator fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.

## **ARTICLE III TERM AND TERMINATION**

**3.1 Effective Date.** This Agreement shall be effective as of the later of the date it is executed by the Parties or the date accepted for filing and made effective by FERC, if such FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.

**3.2 Termination**

**3.2.1 Termination by CAISO.** Subject to Section 5.2, the CAISO reserves the right to suspend or terminate this Agreement in the event the CAISO reasonably determines that the Pseudo-Tie established under this Agreement poses a risk to System Reliability or the risk of a violation of Applicable Reliability Criteria, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement, by giving immediate notice of suspension or thirty (30) days advance written notice of termination. Additionally, the CAISO may terminate this Agreement by giving written notice of termination in the event that the Native Balancing Authority provides notice to the CAISO of its withdrawal from its agreement with the CAISO to participate in the Pseudo-Tie arrangement or the Participating Generator commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given the Participating Generator written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement. With respect to any notice of termination or default given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement was filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default or termination to the Participating Generator; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default or termination to the Participating Generator, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

**3.2.2 Termination by Participating Generator.** In the event that the Participating Generator no longer wishes to be considered part of the CAISO Balancing Authority Area, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days advance written notice. With respect to any notice of termination given by the Participating Generator pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or ninety (90) days after the CAISO's receipt of the Participating Generator's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## **ARTICLE IV GENERAL TERMS AND CONDITIONS**

### **4.1 Pseudo-Tie Requirements and Participating Generator Obligations**

- 4.1.1** The Pseudo-Tie established under this Agreement shall be implemented and operated in accordance with this Agreement, Appendix N and other applicable provisions of the CAISO Tariff, the operating agreement between the CAISO and the Balancing Authority for the Native Balancing Authority Area for the Generating Unit, and all applicable NERC and WECC reliability standards, policies, requirements, and provisions.
- 4.1.2** The technical characteristics of the Generating Unit and associated Pseudo-Tie are set forth in Schedule 1. The Participating Generator may request, and the CAISO may agree, at its sole discretion, to change the CAISO Intertie association.

- 4.1.3** Any unique characteristics of the Pseudo-Tie to the CAISO Balancing Authority Area from the Participating Generator's Generating Unit are set forth in Schedule 1.
- 4.1.4 Notification of Changes.** Sixty (60) days prior to changing any technical information in Schedule 1, the Participating Generator shall notify the CAISO of the proposed changes. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics provided in the revised Schedule 1. The CAISO shall post on the CAISO Website a schedule showing, for at least one year in advance: (i) the proposed dates on which the CAISO's Master File will be updated, which dates shall occur at least every three months; (ii) the dates on which the information contained in the revised Master File will become effective; and (iii) the deadlines by which changed technical information must be submitted to the CAISO in order to be tested and included in the next scheduled update of the CAISO's Master File. Unless the Participating Generator fails to test at the values in the proposed change(s), the change will become effective upon the effective date for the next scheduled update of the CAISO's Master File, provided the Participating Generator submits the changed information by the applicable deadline and is tested by the deadline. Subject to such notification, this Agreement shall not apply to any generating unit identified in Schedule 1 which the Participating Generator no longer owns or no longer has contractual entitlement to.
- 4.2 Agreement Subject to CAISO Tariff.** The Parties will comply with all applicable provisions of the CAISO Tariff. This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.
- 4.3 Obligations Relating to Ancillary Services.**
- 4.3.1 Submission of Bids.** When the Scheduling Coordinator on behalf of the Participating Generator submits a Bid for Ancillary Services, the Participating Generator will, by the operation of this Section 4.3.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.
- 4.3.2 Certification.** The Participating Generator shall not use a Scheduling Coordinator to submit a Bid for the provision of an Ancillary Service or submit a Submission to Self-Provide an Ancillary Service unless the Scheduling Coordinator serving that Participating Generator is in possession of a current certificate pursuant to Sections 8.3.4 and 8.4 of the CAISO Tariff.
- 4.4 Obligations relating to Major Incidents.**
- 4.4.1 Major Incident Reports.** The Participating Generator shall promptly provide such information as the CAISO may reasonably request in relation to major incidents, in accordance with Section 4.6.7.3 of the CAISO Tariff.

## **ARTICLE V PENALTIES AND SANCTIONS**

- 5.1 General.** The Participating Generator shall be subject to all penalties made applicable to Participating Generators within the CAISO Balancing Authority Area. No penalties or sanctions may be imposed under this Agreement unless a Schedule or CAISO Tariff provision providing for such penalties or sanctions has first been filed with and made effective by FERC. Nothing in the Agreement, with the exception of the provisions relating to the CAISO ADR Procedures, shall be construed as waiving the rights of the Participating Generator to oppose or protest any penalty proposed by the CAISO to the FERC or the specific imposition by the CAISO of any FERC-approved penalty on the Participating Generator.

- 5.2 Corrective Measures.** If the Participating Generator fails to meet or maintain the requirements set forth in this Agreement and/or the CAISO Tariff, the CAISO shall be permitted to take any of the measures, contained or referenced in the CAISO Tariff, which the CAISO deems to be necessary to correct the situation.

## **ARTICLE VI COSTS**

- 6.1 Operating and Maintenance Costs.** The Participating Generator shall be responsible for all its costs incurred for the purpose of meeting its obligations under this Agreement.

## **ARTICLE VII DISPUTE RESOLUTION**

- 7.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

## **ARTICLE VIII REPRESENTATIONS AND WARRANTIES**

- 8.1 Representation and Warranties.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.

## **ARTICLE IX LIABILITY**

- 9.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

## **ARTICLE X UNCONTROLLABLE FORCES**

- 10.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

## **ARTICLE XI MISCELLANEOUS**

- 11.1 Assignments.** Subject to Section 3.2.1 of this Agreement, either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written

consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.

- 11.2 Notices.** Any notice, demand or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waivers at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.
- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereto and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.
- 11.8 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Participating Generator shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any

proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

**11.9 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**[NAME OF PARTICIPATING GENERATOR]**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

## **SCHEDULE 1**

**(The following page is a placeholder for Schedule 1, which contains the GENERATING UNIT, PSEUDO-TIE, AND NATIVE BALANCING AUTHORITY AREA Technical Information and Other Unique Characteristics [Sections 4.1.2 and 4.1.3])**



**SCHEDULE 2**

**NOTICES**  
**[Section 11.2]**

**Participating Generator**

Name of Primary  
Representative:

Title:

Company:

Address:

City/State/Zip Code

Email Address:

Phone:

Fax No:

Name of Alternative  
Representative:

Title:

Company:

Address:

City/State/Zip Code

Email Address:

Phone:

Fax No:

**CAISO**

Name of Primary  
Representative:

Title:

Address:

City/State/Zip Code

Email Address:

Phone:

Fax No:

Name of Alternative  
Representative:

Title:

Address:

City/State/Zip Code

Email Address:

Phone:

Fax No:

\* \* \*

## Appendix I

### Station Power Protocol

\* \* \*

#### 2.2 CAISO Monitoring and Review

2.2.1 The CAISO will take the following actions with respect to each application to establish a Station Power Portfolio:

- (a) The CAISO shall post on the CAISO Website a listing of the specific Station Power meters and Generating Units located in the CAISO Balancing Authority Area (which may include a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area, provided that firm transmission service has been reserved across the transmission path from the CAISO Intertie to the Pseudo-Tie Generating Unit and the Station Power service is provided by a UDC or MSS Operator within the CAISO Balancing Authority Area), and any generating facilities outside the CAISO Balancing Authority Area, that compose each Station Power Portfolio, and which are eligible to participate in the self-supply of Station Power in accordance with this SPP.
- (b) The CAISO will provide the appropriate UDC or MSS Operator and the Local Regulatory Authority with one-line diagrams and other information regarding each application.
- (c) The CAISO will make a determination in consultation with the UDC or MSS Operator and the Local Regulatory Authority on the factual question of whether distribution facilities are involved in the requested self-supply of Station Power. Any disputes regarding such determinations shall be subject to the dispute resolution procedures of this CAISO Tariff.
- (d) The CAISO will verify metering schemes and assign unique Load identifiers consistent with the CAISO data templates and validation rules that the Scheduling Coordinator responsible for each meter will be required to use for scheduling and Settlement.

\* \* \*

## **Appendix M**

### **Dynamic Scheduling Protocol (DSP)**

#### **1. DYNAMIC SCHEDULES OF IMPORTS TO THE CAISO BALANCING AUTHORITY AREA**

##### **1.1 CONSISTENCY WITH NERC/WECC POLICIES AND REQUIREMENTS**

**1.1.1** Scheduling and operation of Dynamic Schedule functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling, in accordance with Section 4.5.4.3 of the CAISO Tariff.

##### **1.2 CONTRACTUAL RELATIONSHIPS**

**1.2.1** The Host Balancing Authority must execute an operating agreement with the CAISO particular to the operation of the functionality supporting dynamic imports of Energy, and/or Energy associated with non-Regulation Ancillary Services to the CAISO Balancing Authority Area.

**1.2.2** The Scheduling Coordinator for the System Resource must execute a Dynamic Scheduling Agreement for Scheduling Coordinators with the CAISO governing the operation of the Dynamic Schedule functionality, which agreement will include a provision for its termination based on failure to comply with these standards.

**1.2.3** The Scheduling Coordinator for the System Resource must have the necessary operational and contractual arrangements in place with the Host Balancing Authority to implement Section 1.3 and other provisions of this Appendix M. Such arrangements must include the Host Balancing Authority's ability to receive telemetry from the System Resource and to issue a Dynamic Schedule signal pertinent to that System Resource to the CAISO. Proof of such arrangements must be provided to the CAISO.

##### **1.3 COMMUNICATIONS, TELEMETRY, AND OTHER TECHNICAL REQUIREMENTS**

**1.3.1** The communication and telemetry requirements set forth in the CAISO's Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, will apply to all Dynamic Schedules, except for (a) those dynamic functionalities established prior to the CAISO Operations Date, (b) the requirements that are specific solely to Regulation, and (c) the requirements set forth below.

**1.3.2** A dedicated primary communications link and a backup communications link between the CAISO's EMS and the Host Balancing Authority Area EMS are required.

**1.3.3** The primary circuit will be T1-class, or equivalent, utilizing the inter-control center communications protocol ("ICCP"). The backup communications link will be diversely routed between the Host Balancing Authority Area EMS and the CAISO Balancing Authority Area EMS on separate physical paths and devices, provided that the CAISO may approve an alternative means of providing backup communications if the circumstances warrant.

- 1.3.4** A dedicated primary communications link and a backup communications link between the Host Balancing Authority Area EMS and any Intermediary Balancing Authority Area EMS are required, if requested by the Intermediary Balancing Authority Area.
- 1.3.5** The Balancing Authority Area hosting a Dynamic System Resource must have a mechanism implemented to override the associated dynamic signal.
- 1.3.6** The dynamic signal must be properly incorporated into all involved Balancing Authority Areas' ACE equations.
- 1.3.7** The System Resource must have communications links with the Host Balancing Authority Area consistent with this Appendix M.

## **1.4 LIMITS ON DYNAMIC IMPORTS**

- 1.4.1** The CAISO reserves the right to establish limits applicable to the amount of any Ancillary Services and/or Energy imported into the CAISO Balancing Authority Area, whether delivered dynamically or statically. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of, or a specific import limit applicable to, total CAISO Balancing Authority Area requirements; a percentage at, or a specific import limit applicable to, a particular Intertie or a Transmission Interface; a percentage of, or a specific import limit applicable to, total requirements in a specific Ancillary Service Region; or operating factors which may include, but are not limited to, operating Nomograms, Remedial Action Schemes, protection schemes, scheduling and curtailment procedures, or any potential single points of failure associated with the actual delivery process. The CAISO may implement a moratorium on the establishment of new Dynamic Schedules associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.
- 1.4.2** The CAISO may, at its discretion, either limit or forego procuring Ancillary Services at particular Balancing Authority Area Interties to ensure that Operating Reserves are adequately dispersed throughout the CAISO Balancing Authority Area as required by NERC and WECC reliability standards and any requirements of the NRC.
- 1.4.3** A Dynamic System Resource and its Dynamic Schedules must be permanently associated with a particular CAISO Intertie (the CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Dynamic System Resource with a particular CAISO Intertie).

## **1.5 OPERATING AND SCHEDULING REQUIREMENTS**

- 1.5.1** For any Operating Hour for which Ancillary Services (and associated Energy) is scheduled dynamically to the CAISO from the System Resource, firm transmission service must be reserved across the entire Dynamic Schedule transmission path external to the CAISO Balancing Authority Area. For any Operating Hour for which only Energy is scheduled dynamically to the CAISO from the System Resource, transmission service

must be reserved across the entire Dynamic Schedule transmission path external to the CAISO Balancing Authority Area, or must be available within the Operating Hour, sufficient to support the Schedule and Dispatch of the System Resource. In the event that the System Resource has not established a sufficient transmission reservation prior to the Operating Hour, and will not be able to use additional transmission within the Operating Hour, to support Dispatch up to its maximum available capacity, a derate must be reported in the CAISO's Outage management system to limit its Dispatch to its available transmission.

- 1.5.2** All Dynamic Schedules associated with Dynamic System Resources must be electronically tagged (by use of an E-Tag).
- 1.5.3** Formal inter-Balancing Authority Area Dynamic Schedules may be issued only by the Dynamic System Resource's Host Balancing Authority Area and must be routed through the EMSs of any Intermediary Balancing Authority Area, if requested by the Balancing Authority for the Intermediary Balancing Authority Area.
- 1.5.4** The CAISO will treat dynamically scheduled Energy as a resource contingent firm import. The CAISO will procure (or allow for self-provision of) Operating Reserves for Loads served by Dynamic System Resources as required by NERC and WECC reliability standards and any requirements of the NRC.
- 1.5.5** All Energy Interchange Schedules associated with dynamically scheduled imports of Spinning Reserve and Non-Spinning Reserve will be afforded similar treatment (i.e., resource contingent firm).
- 1.5.6** The dynamic signal must be integrated over time by the Host Balancing Authority Area for every Operating Hour.
- 1.5.7** Notwithstanding any Dispatches of the System Resource in accordance with the CAISO Tariff, the CAISO shall have the right to issue operating orders as defined in Section 37.2.1.1 of the CAISO Tariff to the System Resource either directly or through the Host Balancing Authority Area for emergency or contingency reasons, or to ensure the CAISO's compliance with operating requirements based on WECC or NERC requirements and policies (e.g., WECC's Unscheduled Flow Reduction Procedure). However, such operating orders may be issued only within the range of the CAISO-accepted Energy and Ancillary Services, Bids for a given Operating Hour (or the applicable "sub-hour" interval).
- 1.5.8** If there is no Dynamic Schedule in the CAISO's Day-Ahead Market or HASP/RTM, the dynamic signal must be at "zero" ("0") except when in response to CAISO's Dispatch Instructions associated with accepted Ancillary Services or Energy Bids.
- 1.5.9** The Scheduling Coordinator for the Dynamic System Resource must have the ability to override the associated Dynamic Schedule in order to respond to the operating orders of the CAISO or the Host Balancing Authority.
- 1.5.10** Unless the Dynamic System Resource (1) is implemented as a directly-telemetered Load following functionality, (2) is base-loaded Regulatory Must-Take Generation, (3) responds

to a CAISO intra-hour Dispatch Instruction, or (4) is an Eligible Intermittent Resource, the Dynamic Schedule representing such resource must follow WECC-approved practice of 20-minute ramps centered at the top of the hour. The CAISO does not provide any special Settlements treatment nor offer any CAISO Tariff exemptions for dynamic Load following functionalities.

- 1.5.11** In Real-Time the Dynamic Schedule may not exceed the CAISO's Dispatch Operating Point. The Dispatch Operating Point represents not only the estimated Dynamic System Resource's Energy but also, in combination with any Ancillary Service Award that has not been dispatched as Energy, the transmission reservation on the associated CAISO Intertie.
- 1.5.12** Only one Dynamic System Resource may be associated with any one physical generating resource, unless the CAISO approves an implementation plan to establish multiple Dynamic System Resources for that generating resource.
- 1.5.13** If the Scheduling Coordinator for the Dynamic System Resource desires to participate in CAISO's Regulation market, all provisions of the CAISO's Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, shall apply.

**1.6 CERTIFICATION, TESTING, AND PERFORMANCE MONITORING OF DYNAMIC IMPORTS OF ANCILLARY SERVICES**

Scheduling Coordinators must be certified separately for each Ancillary Service. Scheduling Coordinators that wish to be certified for imports of Regulation shall be subject to certification under the Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, subject to verification of consistency with the requirements of this Appendix M.

- 1.6.1** The Scheduling Coordinator must request the certification of a System Resource to provide Ancillary Services for the CAISO Balancing Authority Area and cooperate, along with the Host Balancing Authority, in the testing of such System Resource in accordance with the CAISO Tariff and applicable CAISO Operating Procedures.
- 1.6.2** Only CAISO tested and certified System Resources will be allowed to bid and/or self-provide Ancillary Services into the CAISO Balancing Authority Area.
- 1.6.3** Dynamic Ancillary Services imports will be certified through testing, in accordance with the applicable CAISO Operating Procedures. All requests for certification of dynamic Ancillary Services imports will be reviewed and approved by the CAISO with respect to any technical limitations imposed by existing operational considerations, such as Remedial Action Schemes, operating Nomograms, and scheduling procedures. These reviews may impose certain Ancillary Services import limits in addition to those outlined in Section 1.4.1 of this Appendix M. Therefore, interested parties are advised and encouraged to contact the CAISO before they begin the process of the necessary systems design, preparation, and implementation for import of Ancillary Services to the CAISO Balancing Authority Area.

**1.6.4** The CAISO will measure the performance of the Dynamic Schedule of Energy associated with an accepted Ancillary Services Bid against (1) the awarded range of Ancillary Service capacity; (2) the certified limits; and (3) the bid Ramp Rate, which shall be validated by the CAISO against the certified Ramp Rate.

**1.6.5** The Scheduling Coordinator for the System Resource must notify the CAISO should any changes, modifications, or upgrades affecting control and/or performance of the System Resource be made. Upon such notification, the CAISO, at its discretion, may require that the System Resource be re-certified to import Ancillary Services into the CAISO Balancing Authority Area.

## **1.7 COMPLIANCE, LOSSES, AND FINANCIAL SETTLEMENTS**

**1.7.1** Energy delivered in association with Dynamic System Resources will be subject to all provisions of the CAISO's Imbalance Energy markets, including Uninstructed Deviation Penalties (UDP) (just as is the case with CAISO intra- Balancing Authority Area Generating Units of Participating Generators).

**1.7.2** Dynamically scheduled and delivered Ancillary Services will be subject to the CAISO's compliance monitoring and remedies, just as any CAISO intra-Balancing Authority Area Generating Units of Participating Generators.

**1.7.3** All Day-Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real-Time (with the exception of intra-hour Dispatch Instructions of the Energy associated with accepted Ancillary Services Bids or Dispatch Instructions for Imbalance Energy).

**1.7.4** All Dynamic Schedules and delivered Energy shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.

**1.7.5** Any transmission losses attributed to the Dynamic Schedule on transmission system(s) external to the CAISO Balancing Authority Area will be the responsibility of the owner(s)/operator(s) of the Dynamic System Resource.

**1.7.6** A predetermined, mutually agreed, and achievable "PMax-like" fixed MW value will be established for every Dynamic System Resource to be used as the basis for the UDP calculation. Responsible Scheduling Coordinators will be able to report de-rates affecting the Dynamic System Resource via the CAISO's SLIC Outage reporting system.

**1.7.7** Should there be any need or requirement, whether operational or procedural, for the CAISO to make Real-Time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules (to include curtailments), Dynamic Schedules shall be treated in the same manner as similarly situated and/or effective static CAISO Interchange Schedules.



## **2. DYNAMIC SCHEDULES OF EXPORTS OF ENERGY FROM GENERATING UNITS IN THE CAISO BALANCING AUTHORITY AREA**

### **2.1 CONSISTENCY WITH NERC/WECC POLICIES AND REQUIREMENTS**

**2.1.1** Scheduling and operation of Dynamic Schedule functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling, in accordance with Section 4.5.4.3 of the CAISO Tariff.

### **2.2 CONTRACTUAL RELATIONSHIPS**

**2.2.1** A Balancing Authority receiving a Dynamic Schedule of an export of Energy from a Generating Unit in the CAISO Balancing Authority Area must execute an operating agreement with the CAISO particular to the operation of the functionality supporting dynamic exports of Energy from the CAISO Balancing Authority Area.

**2.2.2** The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must execute a Dynamic Scheduling Agreement for Scheduling Coordinators with the CAISO governing the operation of the Dynamic Schedule functionality, which agreement will include a provision for its termination based on failure to comply with these standards.

**2.2.3** The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must have the necessary operational and contractual arrangements in place with the Balancing Authority receiving the export Dynamic Schedule to implement Section 2.3 and other provisions of this Appendix M. Such arrangements must include the Balancing Authority's ability to receive telemetry from the Generating Unit and to receive a Dynamic Schedule signal pertinent to that Generating Unit from the CAISO. Proof of such arrangements must be provided to the CAISO.

### **2.3 COMMUNICATIONS, TELEMETRY, AND OTHER TECHNICAL REQUIREMENTS**

**2.3.1** The communication and telemetry requirements set forth in the applicable CAISO Business Practice Manual will apply to a Generating Unit that is the source of the Energy for a Dynamic Schedule of exports of Energy, in addition to the requirements set forth in this Appendix M applicable to Dynamic Schedules of exports of Energy.

**2.3.2** A dedicated primary communications link and a backup communications link between the CAISO's EMS and the EMS of the Balancing Authority Area receiving the Dynamic Schedule are required.

**2.3.3** The primary circuit will be T1-class, or equivalent, utilizing the inter-control center communications protocol ("ICCP"). The backup communications link will be diversely routed between the EMS of the Balancing Authority Area receiving the Dynamic Schedule and the CAISO Balancing Authority Area EMS on separate physical paths and devices, provided that the CAISO may approve an alternative means of providing backup communications if the circumstances warrant.

- 2.3.4** A primary dedicated communications link and a backup communications link between the EMS of the Balancing Authority Area receiving the Dynamic Schedule and any Intermediary Balancing Authority Area EMS are required, if requested by the Intermediary Balancing Authority Area.
- 2.3.5** The CAISO shall have a mechanism implemented to override the associated dynamic signal for a Dynamic Schedule of an export of Energy from a Generating Unit.
- 2.3.6** The dynamic signal must be properly incorporated into all involved Balancing Authority Areas' ACE equations.
- 2.3.7** The Generating Unit must have communications links with the Balancing Authority Area receiving a Dynamic Schedule consistent with this Appendix M.
- 2.3.8** The dynamic signal must be properly incorporated into the CAISO's market systems.

## **2.4 LIMITS ON DYNAMIC EXPORTS**

- 2.4.1** The CAISO reserves the right to establish limits applicable to the amount of any Energy exported from the CAISO Balancing Authority Area, whether delivered dynamically or statically. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of, or a specific export limit applicable to, total CAISO Balancing Authority Area requirements; a percentage at, or a specific export limit applicable to, a particular Intertie or a Transmission Interface; a percentage of, or a specific export limit applicable to, total requirements in a specific Ancillary Service Region; or operating factors which may include, but are not limited to, operating Nomograms, Remedial Action Schemes, protection schemes, scheduling and curtailment procedures, or any potential single points of failure associated with the actual delivery process. The CAISO may implement a moratorium on the establishment of new Dynamic Schedules associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.
- 2.4.2** A Dynamic Schedule of an export of Energy from a Generating Unit in the CAISO Balancing Authority Area must be permanently associated with a particular CAISO Intertie (the CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Generating Unit with a particular CAISO Intertie).

## **2.5 OPERATING AND SCHEDULING REQUIREMENTS**

- 2.5.1** All Dynamic Schedules associated with exports of Energy from a Generating Unit must be electronically tagged (by use of an E-Tag).
- 2.5.2** Formal inter-Balancing Authority Area Dynamic Schedules of the export of Energy from a Generating Unit may be issued only by the CAISO as the Host Balancing Authority Area and must be routed through the EMSs of any Intermediary Balancing Authority Area, if requested by the Intermediary Balancing Authority Area.

- 2.5.3** The CAISO will treat dynamically scheduled exports of Energy from a Generating Unit Energy as a resource contingent firm export. The Balancing Authority receiving the Dynamic Schedule of the export of Energy from the CAISO Balancing Authority Area is responsible for Operating Reserves for loads served by such exports of Energy as required by NERC and WECC reliability standards and any requirements of the NRC.
- 2.5.4** The dynamic signal must be integrated over time by the CAISO for every Operating Hour.
- 2.5.5** Notwithstanding any Dispatches of the Generating Unit in accordance with the CAISO Tariff, the CAISO shall have the right to issue operating orders as defined in Section 37.2.1.1 of the CAISO Tariff to the Generating Unit either directly or through the receiving Balancing Authority Area for emergency or contingency reasons, or to ensure the CAISO's compliance with operating requirements based on WECC or NERC requirements and policies (e.g., WECC's Unscheduled Flow Reduction Procedure). However, such operating orders may be issued only within the range of the CAISO-accepted Energy Bids for a given Operating Hour (or the applicable "sub-hour" interval).
- 2.5.6** If there is no Dynamic Schedule in the CAISO's Day-Ahead Market or HASP/RTM, the dynamic signal must be at "zero" ("0").
- 2.5.7** The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must have the ability to override the associated Dynamic Schedule in order to respond to the operating orders of the CAISO or the Host Balancing Authority.
- 2.5.8** Unless the Dynamic Schedule of an export of Energy from a Generating Unit (1) is implemented as a directly-telemetered load following functionality, (2) is base-loaded Regulatory Must-Take Generation, (3) responds to an intra-hour dispatch instruction from the receiving Balancing Authority, or (4) is an Eligible Intermittent Resource, the Dynamic Schedule representing such resource must follow WECC-approved practice of 20-minute ramps centered at the top of the hour. The CAISO does not provide any special Settlements treatment nor offer any CAISO Tariff exemptions for dynamic load following functionalities.
- 2.5.9** In Real-Time the Dynamic Schedule may not exceed the CAISO's Dispatch Operating Point, which reflects the dynamic signal received by the CAISO from the Balancing Authority receiving the dynamically-scheduled Energy. The CAISO's Dispatch Operating Point represents not only the estimated Energy from the Generating Unit for export but also the transmission reservation on the associated CAISO Intertie.
- 2.5.10** Only one Dynamic Schedule may be associated with any one physical Generating Unit, unless the CAISO approves an implementation plan to establish multiple Dynamic Schedules for that Generating Unit.

## **2.6 COMPLIANCE, LOSSES, AND FINANCIAL SETTLEMENTS**

- 2.6.1** Energy delivered in association with a Dynamic Schedule of an export of Energy from a Generating Unit will be subject to all provisions of the CAISO's Imbalance Energy markets, including Uninstructed Deviation Penalties (UDP) (just as is the case with CAISO intra-Balancing Authority Area Generating Units of Participating Generators).

- 2.6.2** All Day-Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real-Time (with the exception of intra-hour Dispatch Instructions for Imbalance Energy issued by the CAISO and responses to the dynamic signal from the Balancing Authority receiving the Dynamic Schedule of the export of Energy).
- 2.6.3** All Dynamic Schedules and delivered Energy shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.
- 2.6.4** Any transmission losses attributed to the Dynamic Schedule on transmission system(s) external to the CAISO Balancing Authority Area will be the responsibility of the owner(s)/operator(s) of the Generating Unit associated with a Dynamic Schedule of an export of Energy.
- 2.6.5** Should there be any need or requirement, whether operational or procedural, for the CAISO to make Real-Time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules (to include curtailments), Dynamic Schedules shall be treated in the same manner as similarly situated and/or effective static CAISO Interchange Schedules.

\* \* \*

## **Appendix N**

### **Pseudo-Tie Protocol**

- 1. Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area**
- 1.1 Consistency with NERC/WECC Requirements**
- 1.1.1** Operation of Pseudo-Tie functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling. A Pseudo-Tie must be registered as a "Point Of Delivery" (POD) on NERC's Transmission Service Information Network (TSIN). All (off-system) static scheduling associated with Pseudo-Tie functionality must be consistent with NERC Reliability Standards for interchange scheduling and coordination.
- 1.2 CAISO Operating, Technical, and Business Requirements**
- 1.2.1 Operating Requirements**
- 1.2.1.1** The CAISO shall establish and specify the location of any Pseudo-Tie between the CAISO Balancing Authority Area and the Native Balancing Authority Area. All Dynamic Schedules and delivered Energy from a Pseudo-Tie Generating Unit shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.
- 1.2.1.2** A Pseudo-Tie Generating Unit must transfer dynamically its entire output of its Real-Time Generation production into the CAISO Balancing Authority Area at the associated pre-determined CAISO Intertie. A Pseudo-Tie Generating Unit must be permanently associated with a particular pre-determined CAISO Intertie. Any dynamic transfers of

Energy, and/or Energy associated with Ancillary Services will be subject to Congestion mitigation at the associated pre-determined CAISO Intertie. The CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Pseudo-Tie Generating Unit with a particular CAISO Intertie. Any change to the designated path is subject to approval by all applicable transmission providers.

- 1.2.1.3** A Pseudo-Tie Generating Unit shall operate under the terms of the CAISO Tariff applicable to the Generating Units of Participating Generators in the CAISO Balancing Authority Area except as expressly provided, including requirements to promptly follow CAISO Dispatch Instructions, Exceptional Dispatch Instructions, operating orders as defined in Section 37.2.1.1 of the CAISO Tariff, and other instructions, without limitation, pursuant to Sections 7.6 and 7.7 of the CAISO Tariff and any CAISO Operating Procedure established specifically for the Pseudo-Tie, including in the event of an overload condition at the associated pre-determined CAISO Intertie.
- 1.2.1.4** A Participating Generator with a Pseudo-Tie Generating Unit shall demonstrate the ability to deliver the Pseudo-Tie Generating Unit's maximum output to the associated pre-determined CAISO Intertie by providing the CAISO with a copy of its interconnection agreement with the Balancing Authority for its Native Balancing Authority Area.
- 1.2.1.5** Firm transmission for the Operating Hour in a form agreed to by the CAISO must be reserved for the Pseudo-Tie Generating Unit output transfers into the CAISO Balancing Authority Area across the entire transmission path external to the CAISO Balancing Authority Area sufficient to permit delivery of an amount equal to at least the self-scheduled Generation of a Pseudo-Tie Generating Unit. In the event that a sufficient transmission reservation has not been established prior to the Operating Hour to support Dispatch up to the Pseudo-Tie Generating Unit's maximum available capacity, and additional transmission will not be available within the Operating Hour, a derate must be reported in the CAISO's Outage management system to limit its Dispatch to its available transmission.
- 1.2.1.6** All Energy transfers associated with a Pseudo-Tie Generating Unit must be electronically tagged (E-tagged).
- 1.2.1.7** The CAISO will treat all dynamically transferred Pseudo-Tie Generating Unit Energy as internal CAISO Balancing Authority Area Generation (except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie) and will procure, or ensure self-provision of, required Operating Reserves for the CAISO Balancing Authority Area Loads served by a Pseudo-Tie Generating Unit.
- 1.2.1.8** All dynamic Energy transfers associated with CAISO procurement of Spinning Reserve and Non-Spinning Reserve from a Pseudo-Tie Generating Unit will be afforded similar treatment (i.e., treatment as internal CAISO Balancing Authority Area Generation, except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie).
- 1.2.1.9** Off-system sales pursuant to a Pseudo-Tie Participating Generator Agreement shall only be delivered from the Pseudo-Tie Generating Unit. The maximum allowable off-system sales of Energy from a Pseudo-Tie Generating Unit may not exceed the Pseudo-Tie Generating Unit's scheduled output for the respective hour. Off-system sales shall be treated as a firm fixed static export from the CAISO Balancing Authority Area.
- 1.2.1.10** In Real-Time, the total output of a Pseudo-Tie Generating Unit shall be telemetered to the CAISO. If the Pseudo-Tie Generating Unit is an Eligible Intermittent Resource, telemetered data to the CAISO shall include appropriate operational data, meteorological data, and other data reasonably necessary to forecast Energy as specified in Appendix Q

(Eligible Intermittent Resources Protocol) of the CAISO Tariff and applicable Business Practice Manuals.

- 1.2.1.11** The Real-Time dynamic transfer from a Pseudo-Tie Generating Unit may not exceed the CAISO's Dispatch Operating Point. The Dispatch Operating Point represents not only the estimated Dynamic System Resource's Energy but also, in combination with any Ancillary Service Award that has not been dispatched as Energy, the transmission reservation on the associated CAISO Intertie. In the event that a Pseudo-Tie Generating Unit's output creates an imminent reliability issue on the associated pre-determined CAISO Intertie, the Pseudo-Tie Generating Unit will be subject to immediate curtailment by the CAISO. A Pseudo-Tie Generating Unit may also be curtailed whenever its Generation output, less any off-system sales, is greater than the associated transmission reservation pursuant to Section 1.2.1.5 of this Appendix N.
- 1.2.1.12** The CAISO may, at its discretion, either limit or forego procuring any or all Ancillary Services at the particular pre-determined CAISO Intertie associated with a Pseudo-Tie Generating Unit to ensure that Operating Reserves are adequately dispersed throughout the CAISO Balancing Authority Area and its Interties as required by the WECC.
- 1.2.1.13** Unless a particular service is procured by the Participating Generator from some other source, the CAISO shall provide to a Pseudo-Tie Generating Unit all Balancing Authority services available to other Generating Units in the CAISO Balancing Authority Area, which may include the auxiliary load equipment needs of the Pseudo-Tie Generating Unit, provided firm transmission service is reserved across the transmission path from the CAISO Intertie to the Pseudo-Tie Generating Unit.
- 1.2.1.14** The CAISO and the Native Balancing Authority Area will develop a coordinated operating procedure to facilitate the continued delivery of Energy and Ancillary Services from a Pseudo-Tie Generating Unit to the desired delivery points in the event the primary contract path is unavailable or curtailed.
- 1.2.1.15** The CAISO may implement a moratorium on the establishment of new Pseudo-Ties associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.

## **1.2.2 Technical Requirements**

- 1.2.2.1** All applicable communication and telemetry requirements of the WECC, the CAISO, and a Pseudo-Tie Generating Unit's Native Balancing Authority Area regarding generating units and inter-Balancing Authority Area Interties must be satisfied. These requirements include the requirements of Appendix M applicable to Dynamic Schedules of imports and the requirements of the CAISO Tariff applicable to Generating Units in the CAISO Balancing Authority Area.
- 1.2.2.2** Proper incorporation of the dynamic signal into all involved Balancing Authority Areas' ACE equations will be required.
- 1.2.2.3** If there is no Scheduled Generation in the DAM, HASP, or Real-Time markets, a Pseudo-Tie Generating Unit shall not generate except when issued an Exceptional Dispatch or operating order as defined in Section 37.2.1.1 of the CAISO Tariff from the CAISO.
- 1.2.2.4** If a Participating Generator with a Pseudo-Tie Generating Unit desires to participate in the CAISO's Regulation market, all provisions of the CAISO's Standards for Imports of

Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, shall apply.

**1.2.2.5** Only one dynamic transfer signal may be associated with any Pseudo-Tie Generating Unit.

### **1.2.3 Business Requirements**

**1.2.3.1** For Settlements, the Energy transferred dynamically from a Pseudo-Tie Generating Unit during an Operating Hour will be settled based on the Generating Unit revenue meter value, and any static off-system sales represented as an export quantity will be deemed delivered at a Pseudo-Tie for that Operating Hour consistent with Section 1.2.1.9 of this Appendix N.

**1.2.3.2** Any transmission losses and other transmission related costs attributable to a Pseudo-Tie Generating Unit on a non-CAISO transmission system will remain the responsibility of the Participating Generator.

**1.2.3.3** Should there be any need or requirement, whether operational or procedural, for the CAISO to make real time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules at the pre-determined CAISO Intertie associated with a Pseudo-Tie Generating Unit (including curtailments), the dynamic transfer from the Pseudo-Tie Generating Unit shall be treated in the same manner as any CAISO Interchange Schedule at that pre-determined CAISO Intertie.

**1.2.3.4** A Pseudo-Tie Generating Unit will be eligible to set the Market Clearing Price in accordance with the CAISO Tariff in all applicable CAISO Markets.

**1.2.3.5** The CAISO shall assess charges to the Scheduling Coordinator for a Participating Generator with a Pseudo-Tie Generating Unit on the same basis as they apply to any other CAISO intra-Balancing Authority Area Generating Unit, subject to the provisions of this Section 1.2.3.5.

**1.2.3.5.1** Any transfers from a Pseudo-Tie Generating Unit scheduled into the CAISO Balancing Authority Area shall be subject to CAISO charges associated with the DAM and Real-Time Market, except that (1) Energy associated with the Pseudo-Tie Generating Unit will be subject to Intertie Congestion charges that are incorporated into the LMP, (2) Ancillary Services provided by the Pseudo-Tie Generating Unit will be assessed applicable Intertie Congestion charges pursuant to Section 11.10.1 of the CAISO Tariff, and (3) the transfers will be subject to any applicable transmission loss obligation charges in cases where the CAISO and another Balancing Authority have agreed on an assessment to the CAISO of supplemental losses incurred outside of the CAISO Balancing Authority Area.

**1.2.3.5.2** Any off-system sales of Energy shall be subject to all export charges except the Wheeling Access Charge. A special export market Resource ID is required for this purpose for which the Participating Generator shall provide ninety (90) days advance notice prior to implementation.

### **1.3 Operating Agreements**

**1.3.1** A Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area shall be conditional on the facilitation by the Native Balancing Authority Area of the Pseudo-Tie functionality in accordance with an operating agreement between the Balancing Authority for the Native Balancing Authority Area and the CAISO specific to Pseudo-Tie functionality. The CAISO will request that any such operating agreement limit the ability

of the Balancing Authority for the Native Balancing Authority Area to terminate the operating agreement or otherwise withdraw from the Pseudo-Tie functionality established pursuant to the operating agreement.

**1.3.2** A Participating Generator with a Pseudo-Tie Generating Unit shall comply with its contractual obligations to the owners of the facilities to which the Pseudo-Tie Generating Unit is interconnected and/or the Native Balancing Authority Area that affect in any way the ability of the Participating Generator to perform its obligations under its Pseudo-Tie Participating Generator Agreement.

## **2. Pseudo-Ties of Generating Units out of the CAISO Balancing Authority Area**

### **2.1 Consistency with NERC/WECC Requirements**

**2.1.1** Operation of Pseudo-Tie functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling. A Pseudo-Tie must be registered as a “Point Of Delivery” (POD) on NERC’s Transmission Service Information Network (TSIN). All interchange scheduling associated with Pseudo-Tie functionality must be consistent with NERC Reliability Standards for interchange scheduling and coordination.

### **2.2 Operating, Technical, and Business Requirements**

#### **2.2.1 Operating Requirements**

**2.2.1.1** The CAISO and the Balancing Authority for the Attaining Balancing Authority Area will establish the terms of any Pseudo-Tie between the CAISO Balancing Authority Area and the Attaining Balancing Authority Area for a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area, will specify the location of that Pseudo-Tie point, and will register that location as a point of delivery to the Attaining Balancing Authority Area.

**2.2.1.2** The owner of a generating unit that will be a Pseudo-Tie out of the CAISO Balancing Authority Area must (a) transfer dynamically its entire output of its real time generation production and (b) submit Bids, including Self-Schedules, into the CAISO Markets to schedule the use of CAISO transmission associated with the export of the Pseudo-Tie generating unit Energy into the Attaining Balancing Authority Area at the associated pre-existing CAISO physical Intertie, as provided in Section 2.2.2.3 of this Appendix N.

**2.2.1.3** There will be no static imports from a Pseudo-Tie generating unit directly into the CAISO Balancing Authority Area.

**2.2.1.4** All Energy transfers associated with a Pseudo-Tie generating unit must be electronically tagged (e-tagged).

**2.2.1.5** The CAISO will treat all dynamically transferred Energy from a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area as generation external to the CAISO Balancing Authority Area.

**2.2.1.6** In case a generating unit that is a Pseudo-Tie out of the CAISO Balancing Authority Area is curtailed or forced out of service in real-time, the associated Pseudo-Tie Bids submitted into the CAISO Markets must be adjusted by the next available CAISO Market scheduling timeframe.

**2.2.1.7** In real-time, the total output of a Pseudo-Tie generating unit shall be telemetered to the CAISO and to the Balancing Authority for the Attaining Balancing Authority Area.



- 2.2.1.8** In real-time, the total Energy from a Pseudo-Tie generating unit shall not exceed the capacity of the Pseudo-Tie generating unit as specified in the agreement between the CAISO and the owner of the Pseudo-Tie generating unit.
- 2.2.1.9** The CAISO, the Balancing Authority for the Attaining Balancing Authority Area, any affected Participating Transmission Owner, and the owner of the Pseudo-Tie generating unit will develop a coordinated operating procedure outlining the agreed upon framework among all parties for the operation of a Pseudo-Tie of the generating unit out of the CAISO Balancing Authority Area.
- 2.2.1.10** The output of a Pseudo-Tie generating unit may be subject to real-time curtailments and operating orders as defined in Section 37.2.1.1 of the CAISO Tariff as directed by the CAISO in accordance with Good Utility Practices.
- 2.2.1.11** The CAISO may implement a moratorium on the establishment of new Pseudo-Ties associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.
- 2.2.2** **Technical Requirements**
- 2.2.2.1** All applicable communication and telemetry requirements of the WECC, the CAISO, and the Balancing Authority for the Attaining Balancing Authority Area regarding generating units and inter-Balancing Authority Area interties must be satisfied, provided that the CAISO's communications and telemetry requirements for Generating Units in the CAISO Balancing Authority Area shall not be applicable, except that the owner of a generating unit that is a Pseudo-Tie out of the CAISO Balancing Authority Area shall provide meteorological data and forecast information from any wind or solar resource in accordance with the requirements for Eligible Intermittent Resources in Appendix Q (Eligible Intermittent Resources Protocol) of the CAISO Tariff and applicable Business Practice Manuals.
- 2.2.2.2** Proper incorporation of the dynamic signal into all involved Balancing Authority Areas' ACE equations will be required.
- 2.2.2.3** A Pseudo-Tie generating unit must be permanently associated with a particular pre-existing CAISO Intertie. If for any reason delivery cannot be made to the associated pre-existing CAISO Intertie, the CAISO may still treat the Energy from a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area as deemed delivered to the owner of the Pseudo-Tie generating unit at an alternate designated Intertie with available capacity. The Balancing Authority for the Attaining Balancing Authority Area will immediately request emergency wheeling service from the CAISO under provisions of the inter-Balancing Authority agreement between the CAISO and that Balancing Authority to maintain the Pseudo-Tie generating unit schedule via the alternate designated Intertie. The owner of the Pseudo-Tie generating unit, or its designated Scheduling Coordinator, will reschedule the Pseudo-Tie generating unit Energy in the next available CAISO scheduling timeframe through the CAISO scheduling system, until the transmission path to the associated pre-existing CAISO Intertie is re-established. The owner of the Pseudo-Tie generating unit, or its designated Scheduling Coordinator, will be charged and will pay for the requested emergency use transmission and all associated CAISO charges, in accordance with the CAISO Tariff, for this emergency service.
- 2.2.2.4** Only one dynamic transfer signal may be associated with a Pseudo-Tie generating unit.

**2.2.2.5** Should there be any need or requirement, whether operational or procedural, for the CAISO or the Balancing Authority for the Attaining Balancing Authority Area to make real-time adjustments to the CAISO's inter-Balancing Authority Area schedules at the pre-existing CAISO Intertie associated with the Pseudo-Tie generating unit (including curtailments), the dynamic transfer from the Pseudo-Tie generating unit shall be treated in the same manner as any CAISO Interchange Schedule at that pre-existing CAISO Intertie, and in accordance with any applicable operating instructions from any affected Participating Transmission Owner.

**2.2.2.6** Energy delivered from the Pseudo-Tie generating unit will be subject to all provisions of the Balancing Authority Area procedures of the Balancing Authority for the Attaining Balancing Authority Area.

## **2.2.3 Business Requirements**

**2.2.3.1** For settlements, the Energy transferred dynamically from the Pseudo-Tie generating unit during an operating hour will be deemed delivered, for that operating hour.

**2.2.3.2** All Energy from a Pseudo-Tie generating unit interchange shall be subject to the CAISO Tariff Transmission Loss construct and billed accordingly to the owner of the Pseudo-Tie generating unit or the designated Scheduling Coordinator for the Pseudo-Tie generating unit, including any applicable transmission loss obligation charges in cases where the CAISO and another Balancing Authority have agreed on an assessment to the CAISO of supplemental losses incurred for the Energy outside of the CAISO Balancing Authority Area.

**2.2.3.3** The ISO shall assess the owner of a Pseudo-Tie generating unit or its designated Scheduling Coordinator all applicable market charges and Grid Management Charges in accordance with the CAISO Tariff.

**2.2.3.4** In the event of a line outage and a subsequent request by the Balancing Authority for the Attaining Balancing Authority Area for emergency Wheeling service from the CAISO to maintain deliveries of power to the Attaining Balancing Authority Area from the Pseudo-Tie generating unit, all CAISO Tariff market and GMC charges applicable to the resulting use of CAISO transmission service shall be applied for the duration of these events, inclusive of any related HASP Schedules.

**2.2.3.5** All Pseudo-Tie generating unit export schedules from the Attaining Balancing Authority Area shall be submitted by a certified Scheduling Coordinator into the CAISO Markets as coordinated import and export Wheeling Through Bids, at the designated pre-existing Intertie with the Attaining Balancing Authority Area associated with the Pseudo-Tie.

## **2.3 Operating Agreements**

**2.3.1** A Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area shall be conditional on the facilitation by the Balancing Authority for the Attaining Balancing Authority Area of the Pseudo-Tie functionality in accordance with an operating agreement to be entered into between the Balancing Authority for the Attaining Balancing Authority Area and the CAISO specific to Pseudo-Tie functionality.

**2.3.2** The owner of a Pseudo-Tie generating unit shall comply with its contractual obligations with the owners of the facilities to which the Pseudo-Tie generating unit is interconnected and/or the Attaining Balancing Authority Area that affect in any way the ability of the owner of the Pseudo-Tie generating unit to perform its obligations under the CAISO Tariff

and an agreement to be entered into between the owner of the Pseudo-Tie generating unit and the CAISO.

\* \* \*

## **Appendix Q Eligible**

### **Intermittent Resources Protocol (EIRP)**

\* \* \*

#### **2.2.1 Agreements**

The following agreements must be executed by the owner or operator of any Eligible Intermittent Resource, unless that resource is not subject to any of these agreements pursuant to the CAISO Tariff, such as an Eligible Intermittent Resource of an MSS Operator:

- (a) A Participating Generator Agreement, QF PGA, Dynamic Scheduling Agreement for Scheduling Coordinators, or Pseudo-Tie Participating Generator Agreement that, among other things, binds the Eligible Intermittent Resource to comply with the CAISO Tariff; and
- (b) A Meter Service Agreement for CAISO Metered Entities, for all Eligible Intermittent Resources other than Dynamic System Resources.

If an Eligible Intermittent Resource intends to become a Participating Intermittent Resource, it must also execute a letter of intent, which when executed and delivered to the CAISO shall initiate the process of certifying the Participating Intermittent Resource. The form of the letter of intent shall be specified by the CAISO in a Business Practice Manual.

#### **2.2.2 Composition of a Participating Intermittent Resource**

The CAISO shall develop criteria to determine whether one or more Eligible Intermittent Resources may be included within a Participating Intermittent Resource. Such criteria shall include:

- (a) A Participating Intermittent Resource must be at least one (1) MW rated capacity.
- (b) A Participating Intermittent Resource may include one (1) or more Eligible Intermittent Resources that have similar response to weather conditions or other variables relevant to forecasting Energy, as determined by the CAISO.
- (c) Each Participating Intermittent Resource shall be electrically connected at a single point on the CAISO Controlled Grid, except as otherwise permitted by the CAISO on a case-by-case basis as may be allowed under the CAISO Tariff. Interconnection to a portion of the CAISO Controlled Grid outside or not contiguous to the CAISO Balancing Authority Area does not make an Eligible Intermittent Resource that is a Dynamic System Resource or Pseudo-Tie Generating Unit eligible to be included within a Participating Intermittent Resource.
- (d) The same Scheduling Coordinator must schedule all Eligible Intermittent Resources aggregated into a single Participating Intermittent Resource.

\* \* \*

## **Appendix X**

**[Not Used]**

\* \* \*

**Attachment B - Marked Tariff**  
**Dynamic Transfer Proposal Tariff Amendment**  
**California ISO Fifth Replacement Tariff**  
**July 29, 2011**

\* \* \*

#### **4.5.1.1.6.2 Scheduling Coordinator Applicant's Obligation for Contracts**

A Scheduling Coordinator Applicant must certify that it is duly authorized to represent the Generators and Loads that are its Scheduling Coordinator Customers and must further certify that:

- (a) represented Generators have entered into Participating Generator Agreements, ~~or~~ Qualifying Facility Participating Generator Agreements, or Pseudo-Tie Participating Generator Agreements as provided in Appendices B.2, B.3, and B.163, respectively with the CAISO;
- (b) represented UDCs have entered into UDC Operating Agreements as provided in Appendix B.8 with the CAISO;
- (c) represented CAISO Metered Entities have entered into Meter Service Agreements for CAISO Metered Entities as provided in Appendix B.6 with the CAISO;
- (d) none of the Wholesale Customers it will represent are ineligible for wholesale transmission service pursuant to the provisions of the FPA Section 212(h); and
- (e) each End-Use Customer it will represent is eligible for service as a Direct Access End User pursuant to an established program approved by the California Public Utilities Commission or a Local Regulatory Authority.

A Scheduling Coordinator Applicant that seeks to serve as Scheduling Coordinator for one or more Convergence Bidding Entities must certify that it is duly authorized to represent those Convergence Bidding Entities and to submit and settle Virtual Bids on their behalf.

\* \* \*

#### **4.5.4.3 Dynamic Scheduling**

##### **4.5.4.3.1 Dynamic Scheduling of Imports**

Scheduling Coordinators may submit Bids for imports of Energy and Ancillary Services for which associated Energy is delivered from Dynamic System Resources located outside of the CAISO Balancing

Authority Area, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards, ~~including~~ and any requirements of the NRC, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the Dynamic Scheduling Protocol in Appendix ~~M~~ or posted in standards on the CAISO Website, are satisfied, (c) the Scheduling Coordinator for the Dynamic System Resource executes a Dynamic Scheduling Agreement for Scheduling Coordinators as provided in Appendix B.5 with the CAISO for the operation of dynamic scheduling functionality, and (d) all affected ~~Host Balancing Authorities and Intermediary Balancing Authorities~~ each execute with the CAISO ~~an Interconnected Balancing Authority Area Operating Agreement~~, a Dynamic Scheduling Host Balancing Authority Operating Agreement as provided in Appendix B.9, or a special operating agreement particular ~~related~~ to the operation of dynamic functionality.

#### **4.5.4.3.2 Dynamic Scheduling of Exports of Energy**

Scheduling Coordinators may submit Bids for Dynamic Schedules of exports of Energy from Generating Units located in the CAISO Balancing Authority Area, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards and any requirements of the NRC, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the Dynamic Scheduling Protocol in Appendix M or posted in standards on the CAISO Website, are satisfied, (c) the Scheduling Coordinator for the Generating Unit executes a Dynamic Scheduling Agreement for Scheduling Coordinators as provided in Appendix B.5 with the CAISO for the operation of dynamic scheduling functionality, and (d) all affected Balancing Authorities each execute with the CAISO an operating agreement particular to the operation of dynamic functionality. Scheduling Coordinators may not submit Bids for Dynamic Schedules of exports of Ancillary Services from resources located in the CAISO Balancing Authority Area, nor may Scheduling Coordinators submit Bids for Dynamic Schedules of exports from Loads located in the CAISO Balancing Authority Area.

\* \* \*

#### **4.6 Relationship Between CAISO And Generators**

The CAISO shall not accept Bids for any Generating Unit interconnected to the electric grid within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO

Balancing Authority Area) otherwise than through a Scheduling Coordinator. The CAISO shall further not be obligated to accept Bids from Scheduling Coordinators relating to Generation from any Generating Unit interconnected to the electric grid within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) unless the relevant Generator undertakes in writing, by entering into a Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Metered Subsystem Agreement- with the CAISO, to comply with all applicable provisions of this CAISO Tariff as they may be amended from time to time, including, without limitation, the applicable provisions of this Section 4.6 and Section 7.7.

#### **4.6.1 General Responsibilities**

##### **4.6.1.1 Operate Pursuant to Relevant Provisions of CAISO Tariff**

Participating Generators shall operate, or cause their facilities to be operated, in accordance with the relevant provisions of this CAISO Tariff, including, but not limited to, the operating requirements for normal and emergency operating conditions specified in Section 7 and the requirements for the dispatch and testing of Ancillary Services specified in Section 8.

- (i) Each Participating Generator shall immediately inform the CAISO, through its respective Scheduling Coordinator, of any change or potential change in the current status of any Generating Units that are under the Dispatch control of the CAISO. This will include, but not be limited to, any change in status of equipment that could affect the maximum output of a Generating Unit, the minimum load of a Generating Unit, the ability of a Generating Unit to operate with automatic voltage regulation, operation of the PSSs (whether in or out of service), the availability of a Generating Unit governor, or a Generating Unit's ability to provide Ancillary Services as required. Each Participating Generator shall immediately report to the CAISO, through its Scheduling Coordinator, any actual or potential concerns or problems that it may have with respect to Generating Unit direct digital control equipment, Generating Unit voltage control equipment, or any other equipment that may impact the reliable operation of the CAISO Controlled Grid.



(ii) In the event that a Participating Generator cannot meet its Generation schedule as specified in the Day-Ahead Schedule, or comply with a Dispatch Instruction, whether due to a Generating Unit trip or the loss of a piece of equipment causing a reduction in capacity or output, the Participating Generator shall notify the CAISO, through its Scheduling Coordinator, at once. If a Participating Generator will not be able to meet a time commitment or requires the cancellation of a Generating Unit Start-Up, it shall notify the CAISO, through its Scheduling Coordinator, at once.

(iii) In addition to complying with the other requirements of this Section 4.6.1.1 regarding the operation of its Generating Unit, a Participating Generator with a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area shall comply with the requirements of Section 1.2.1 and related provisions of the Pseudo-Tie Protocol in Appendix N.

\* \* \*

#### **4.15 Relationships between CAISO and Pseudo-Ties to CAISO**

A Generator that desires a Pseudo-Tie of its Generating Unit from a Native Balancing Authority Area to the CAISO Balancing Authority Area shall comply with the applicable provisions of the Pseudo-Tie Protocol in Appendix N in addition to all provisions of this CAISO Tariff applicable to Participating Generators, except as expressly provided, including that it shall be required to enter into a Pseudo-Tie Participating Generator Agreement with the CAISO rather than a Participating Generator Agreement.

#### **4.16 Relationships between CAISO and Pseudo-Ties Out**

A Pseudo-Tie of the output of a generating unit out of the CAISO Balancing Authority Area to an Attaining Balancing Authority Area shall comply with the applicable provisions of the Pseudo-Tie Protocol in Appendix N, including being the subject of a special operating agreement with the CAISO.

\* \* \*

**6.5.5.1.1** Every fifteen (15) minutes, the CAISO will communicate via the secure communication system Start-Up and Shut-Down Instructions and Real-Time AS Awards to internal resources (which include Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area).

\* \* \*

## **7.2 Operating Reliability Criteria**

The CAISO shall exercise Operational Control over the CAISO Controlled Grid in compliance with all Applicable Reliability Criteria and Operating Procedures. The North American Electric Reliability Corporation's (NERC) Qualified Path Unscheduled Flow Relief for the Western Electricity Coordinating Council (WECC), Reliability Standard WECC-IRO-STD-006-0 filed by NERC in FERC Docket No. RR07-11-000 on March 26, 2007, and approved by FERC on June 8, 2007, and any amendments thereto, are hereby incorporated and made part of this CAISO Tariff. See [www.nerc.com](http://www.nerc.com) for the current version of the NERC's Qualified Path Unscheduled Flow Relief Procedures for WECC.

\* \* \*

## **8.1 Scope**

The CAISO shall be responsible for ensuring that there are sufficient Ancillary Services available to maintain the reliability of the CAISO Controlled Grid consistent with NERC and WECC reliability standards, including any requirements of the NRC. The CAISO's Ancillary Services requirements may be self-provided by Scheduling Coordinators as further provided in the Business Practice Manuals. Those Ancillary Services which the CAISO requires to be available but which are not being self-provided will be competitively procured by the CAISO from Scheduling Coordinators in the Day-Ahead Market, the HASP, -and the RTM consistent with Section 8.3. The provision of Ancillary Services from the Interties with interconnected Balancing Authority Areas is limited to Ancillary Services bid into the competitive procurement processes in the IFM-, HASP, and RTM. The CAISO will not accept Submissions to Self-Provide Ancillary Services that are imports to the CAISO Balancing Authority Area over the Interties with interconnected Balancing Authority Areas, except from Dynamic System Resources certified to provide Ancillary Services or if provided pursuant to ETCs, TORs or Converted Rights. The CAISO will accept Submissions to Self-Provide Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area if they are certified to provide Ancillary Services. The CAISO will calculate

payments for Ancillary Services supplied by Scheduling Coordinators and charge the cost of Ancillary Services to Scheduling Coordinators based on their Ancillary Service Obligations.

For purposes of this CAISO Tariff, Ancillary Services are: (i) Regulation Up and Regulation Down, (ii) Spinning Reserve, (iii) Non-Spinning Reserve, (iv) Voltage Support, and (v) Black Start capability.

These services will be procured as stated in Section 8.3.5. Bids for these services may be submitted by a Scheduling Coordinator for resources that are capable of providing the specific service and that meet applicable Ancillary Service standards and technical requirements, as set forth in Sections 8.1 through 8.4, and are certified by the CAISO to provide Ancillary Services. Identification of specific services in this CAISO Tariff shall not preclude development of additional interconnected operation services over time. The CAISO and Market Participants will seek to develop additional categories of these unbundled services over time as the operation of the CAISO Controlled Grid matures or as required by regulatory authorities.

\* \* \*

### **8.2.3.3 Voltage Support**

The CAISO shall determine on an hourly basis for each day the quantity and location of Voltage Support required to maintain voltage levels and reactive margins within NERC and WECC reliability standards, including and any requirements of the NRC using a power flow study based on the quantity and location of scheduled Demand. The CAISO shall issue daily voltage schedules (Dispatch Instructions) to Participating Generators, Participating TOs and UDCs, which are required to be maintained for CAISO Controlled Grid reliability. All other Generating Units shall comply with the power factor requirements set forth in contractual arrangements in effect on the CAISO Operations Date, or, if no such contractual arrangements exist and the Generating Unit exists within the system of a Participating TO, the power factor requirements applicable under the Participating TO's TO Tariff or other tariff on file with the FERC. All Participating Generators that operate Asynchronous Generating Facilities subject to the Large Generator Interconnection Agreement set forth in Appendix BB or CC shall maintain the CAISO specified voltage schedule for those facilities at the Point of Interconnection to the extent possible, except as permitted under Appendix H of the Large Generator Interconnection Agreement, while operating within

the power factor range specified in their interconnection agreements. For all other Generating Units, Participating Generators shall maintain the CAISO specified voltage schedule at the Generating Unit terminals to the extent possible, while operating within the power factor range specified in their interconnection agreements, or, for Regulatory Must-Take Generation, Regulatory Must-Run Generation and Reliability Must-Run Generation, consistent with existing obligations. For Generating Units that do not operate under one of these agreements, the minimum power factor range will be within a band of 0.90 lag (producing VARs) and 0.95 lead (absorbing VARs) power factors. Participating Generators with Generating Units existing at the CAISO Operations Date that are unable to meet this operating power factor requirement may apply to the CAISO for an exemption. Prior to granting such an exemption, the CAISO shall require the Participating TO, UDC, or other utility~~UDC~~ to whose system the relevant Generating Units are interconnected to notify it of the existing contractual requirements for Voltage Support established prior to the CAISO Operations Date for such Generating Units. Such requirements may be contained in CPUC Electric Rule 21 or the Interconnection Agreement with the Participating TO, UDC, or other utility~~UDC~~. The CAISO shall not grant any exemption under this Section from such existing contractual requirements. The CAISO shall be entitled to instruct Participating Generators to operate their Generating Units at specified points within their power factor ranges. Participating Generators shall receive no compensation for operating within these specified ranges.

If the CAISO requires additional Voltage Support, it shall procure this either through Reliability Must-Run Contracts or, if no other more economic sources are available, by instructing a Generating Unit to move its MVar output outside its mandatory range. Only if the Generating Unit must reduce its MW output in order to comply with such an instruction will it be eligible to recover its opportunity cost in accordance with Section 11.10.1.4.

All Loads directly connected to the CAISO Controlled Grid shall maintain reactive flow at grid interface points within a specified power factor band of 0.97 lag to 0.99 lead. Loads shall not be compensated for the service of maintaining the power factor at required levels within the bandwidth. A UDC interconnecting with the CAISO Controlled Grid at any point other than a Scheduling Point shall be subject to the same power factor requirement.

The CAISO will establish voltage control standards with UDCs and the operators of other Balancing Authority Areas and will enter into operational agreements providing for the coordination of actions in the event of a voltage problem occurring.

\* \* \*

### **8.3.1 Procurement Of Ancillary Services**

The CAISO shall operate a competitive Day-Ahead Market, HASP, and Real-Time Markets to procure Ancillary Services. The Security Constrained Unit Commitment (SCUC) and Security Constrained Economic Dispatch (SCED) applications used in the Integrated Forward Market (IFM), HASP, and the Real-Time Market (RTM) shall calculate optimal resource commitment, Energy, and Ancillary Services Awards and Schedules at least cost to End-Use Customers consistent with maintaining System Reliability. Any Scheduling Coordinator representing resources, System Units, Participating Loads, Proxy Demand Resources or imports of System Resources may submit Bids into the CAISO's Ancillary Services markets provided that it is in possession of a current certificate for the resources concerned. Regulation Up, Regulation Down, and Operating Reserves necessary to meet CAISO requirements not met by self-provision will be procured by the CAISO as described in this CAISO Tariff. The amount of Ancillary Services procured in the IFM is based on the CAISO Forecast of CAISO Demand and the forecasted intertie schedules in HASP for the Operating Hour net of (i) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services and (ii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of additional Ancillary Services procured in the HASP is based on the CAISO Forecast of CAISO Demand, the Day-Ahead Schedules established net interchange, and the forecast of the Intertie Schedules~~intertie schedules~~ for the Operating Hour in the HASP net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, and (iii) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The amount of Ancillary Services procured in the Real-Time Market is based upon the CAISO Forecast of CAISO Demand and the HASP Intertie Schedule

established net interchange for the Operating Hour net of (i) available awarded Day-Ahead Ancillary Services, (ii) Self-Provided Ancillary Services from resources internal to the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and Dynamic System Resources certified to provide Ancillary Services, (iii) additional Operating Reserves procured in HASP, and (iv) Ancillary Services self-provided pursuant to an ETC, TOR or Converted Right. The CAISO will manage the Energy from both CAISO procured and Self-Provided Ancillary Services as part of the Real-Time Dispatch. In the Day-Ahead Market, the CAISO procures one-hundred (100) percent of its Ancillary Service requirements based on the Day-Ahead Demand Forecast net of Self-Provided Ancillary Services. After the Day-Ahead Market, the CAISO procures additional Ancillary Services needed to meet system requirements from all resources in the Real-Time Market. The amount of Ancillary Services procured in the HASP and Real-Time Market is based on the CAISO Forecast of CAISO Demand for the Operating Hour net of Self-Provided Ancillary Services.

The CAISO procurement of Ancillary Services from Non-Dynamic System Resources in the HASP is for the entire next Operating Hour. The CAISO procurement of Ancillary Services from all other resources in the Real-Time Market is for a fifteen (15) minute time period to which the relevant RTUC applies. The CAISO's procurement of Ancillary Services from Non-Dynamic System Resources in HASP and from Dynamic System Resources and internal Generation (which includes Generation from Generating Units that are Pseudo-Ties to the CAISO Balancing Authority Area) in the Real-Time Market is based on the Ancillary Service Bids submitted or generated in the HASP consistent with the requirements in Section 30. The CAISO may also procure Ancillary Services pursuant to the requirements in Section 42.1 and as permitted under the terms and conditions of a Reliability Must-Run Contract.

The CAISO will contract for long-term Voltage Support service with owners of Reliability Must-Run Units under Reliability Must-Run Contracts. The CAISO will procure Black Start capability through individual contracts with Scheduling Coordinators for Reliability Must-Run Units and other Generating Units which have Black Start capability. These requirements and standards apply to all Ancillary Services whether self-provided or procured by the CAISO.

### **8.3.2 Procurement from Internal And External Resources**

The CAISO will procure Spinning Reserves and Non-Spinning Reserves from resources operating within the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and from imports of System Resources. Scheduling Coordinators are allowed to bid Regulation from resources located outside the CAISO Balancing Authority Area by dynamically scheduling such System Resources certified to provide Regulation. Each System Resource used to bid Regulation must comply with the Dynamic Scheduling Protocol in Appendix ~~M.X~~. Scheduling Coordinators may submit Bids for Operating Reserves from Non-Dynamic System Resources but they may not submit Bids for Regulation from such resources because these resources cannot be dynamically scheduled consistent with Appendix ~~M.X~~. When bidding to supply Ancillary Services in the IFM, HASP, or RTM, imports and Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area compete for use of Intertie transmission capacity when the requested use is in the same direction, e.g., imports of Ancillary Services and Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area compete with Energy on Interties in the import direction, and exports of Ancillary Services (i.e., on demand obligations) compete with Energy on Interties in the export direction. To the extent there is Congestion, imports of Ancillary Services and suppliers of Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area will pay Congestion costs in the IFM, HASP, and RTM markets pursuant to Section 11.

### **8.3.4 Certification And Testing Requirements**

The owner of and Scheduling Coordinator for each resource 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 resource 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 ~~M.X~~. Spinning Reserve may be provided only from resources that 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 resources that have been certified and tested by the CAISO using the process defined in Part C of Appendix K. Voltage Support may only be provided from resources that have been certified and tested by the CAISO using the process defined in Part D of Appendix K. Black Start capability may only be provided from Generating Units that have been certified and tested by the CAISO using the process defined in Part E of Appendix K. CAISO certification to provide Ancillary Services may be revoked by the CAISO under the provisions of this CAISO Tariff, including Appendix K.

\* \* \*

### **8.3.7 AS Bidding Requirements**

Scheduling Coordinators may submit Bids or Submissions to Self-Provide an Ancillary Service consistent with the rules specified in Section 30 and any further requirements in this Section 8.3.7. Scheduling Coordinators may (i) submit Bids or Submissions to Self-Provide an Ancillary Service from resources located within the CAISO Balancing Authority Area (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) or Dynamic System Resources certified to provide Ancillary Services, (ii) submit Submissions to Self-Provide an Ancillary Service from System Resources located outside the CAISO Balancing Authority Area if provided pursuant to ETCs, TORs, or Converted Rights, (iii) submit Bids for Ancillary Services from Dynamic and Non-Dynamic System Resources located outside the CAISO Balancing Authority Area certified to provide Ancillary Services, or (iv) submit Inter-SC Trades of Ancillary Services. Ancillary Services procured in the IFM and in the Real-Time Market are comprised of the following: Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve. The HASP process evaluates the need for Energy, Regulation and Operating Reserves from System Resources and internal resources (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) and issues binding Ancillary Services awards only for Operating Reserves Ancillary Services from Non-Dynamic System Resources. Each resource for which a Scheduling Coordinator wishes to submit Ancillary Service Bids must meet the requirements set forth in this CAISO Tariff. The same resource capacity may be simultaneously offered to the same CAISO Market for multiple Ancillary Services types. Ancillary Services Bids and Submissions to Self-Provide an Ancillary Service can be submitted up to seven (7) days in advance. The CAISO will only use Operating Reserve Ramp Rates for procuring capacity associated with the specific Ancillary Services. The CAISO will issue



Real-Time Dispatch Instructions in the Real-Time Market for the Energy associated with the awarded capacity based upon the applicable Operational Ramp Rate submitted with the single Energy Bid Curve in accordance with Section 30.7.7. There is no ability to procure Ancillary Services for export.

-To the extent a Scheduling Coordinator has an on-demand obligation to serve loads outside the CAISO Balancing Authority Area, it can do so provided that (1) it is using export transmission capacity available in Real-Time, and (2) the resource capacity providing Energy to satisfy the on-demand obligation is not under an RMR Contract or Resource Adequacy Capacity obligation, and has not been paid a RUC Availability Payment for the Trading Hour. All resources subject to the Ancillary Services must offer requirements, as specified in Section 40.6, must submit Bids consistent with the requirements specified therein and in Section 30.

#### **8.3.7.1 Requirement for Imports of Spinning or Non-Spinning Reserves**

-Scheduling Coordinators may submit Bids for imports of Spinning Reserve, or Non-Spinning Reserve from System Resources located outside the CAISO Balancing Authority Area, including Dynamic System Resources, where technically feasible and consistent with NERC and WECC reliability standards, ~~including and~~ any requirements of the NRC; and provided that such Scheduling Coordinators have certified to the CAISO their ability to deliver the service to the point of interchange with the CAISO Balancing Authority Area (including with respect to their ability to make changes, or cause such changes to be made, to Interchange Schedules during any interval of a Settlement Period at the discretion of the CAISO).

#### **8.3.7.2 Requirement for Imports of Regulation**

-Scheduling Coordinators may bid imports of Regulation from System Resources located outside the CAISO Balancing Authority Area, where technically feasible and consistent with NERC and WECC reliability standards, ~~including and~~ any requirements of the NRC, by dynamic scheduling; provided that the Host Balancing Authority for the Host operator of the Balancing Authority Area in which the System Resources are located has entered into an operating agreement with the CAISO particular to the operation of dynamic functionality for interconnected Balancing Authority Area operations; and provided that such Scheduling Coordinator, ~~with and the cooperation operator of the~~ Host Balancing Authority for

the Host Balancing Authority Area in which the resources are located, ~~has~~ have been certified by the CAISO as to their ability to dynamically adjust Interchange Schedules based on control signals issued by the CAISO anytime during a Settlement Period at the discretion of the CAISO. Such certification shall include a demonstration of their ability to support the dynamic Interchange of Regulation service based on CAISO control signals received on dedicated communications links (either directly or through EMS computers) for CAISO computer control and telemetry to provide this function in accordance with CAISO standards and procedures posted on the CAISO Website.

\* \* \*

### **9.3.6 Maintenance Outage Planning**

Each Operator shall, by not later than October 15 each year, provide the CAISO with a proposed schedule of all Maintenance Outages it wishes to undertake in the following year. The proposed schedule shall include all of the Operator's transmission facilities that comprise the CAISO Controlled Grid and Generating Units subject to a Participating Generator Agreement, QF PGA, or Pseudo-Tie Participating Generator Agreement (including its Reliability Must-Run Units). In the case of a Participating TO's transmission facilities, that proposed schedule shall be developed in consultation with the UDCs interconnected with that Participating TO's system and shall take account of each UDC's planned maintenance requirements. The nature of the information to be provided and the detailed Maintenance Outage planning procedure shall be established by the CAISO. This information shall include:

The following information is required for each Generating Unit of a Participating Generator:

- (a) the Generating Unit name and Location Code;
- (b) the MW capacity unavailable;
- (c) the scheduled start and finish date for each Outage; and
- (d) where there is a possibility of flexibility, the earliest start date and the latest finish date, along with the actual duration of the Outage once it commences.

The following information is required for each transmission facility:

- (a) the identification of the facility and location;
- (b) the nature of the proposed Maintenance Outage;

- (c) the preferred start and finish date for each Maintenance Outage; and
- (d) where there is a possibility of flexibility, the earliest start date and the latest finish date, along with the actual duration of the Outage once it commences.

Either the CAISO, pursuant to Section 9.3.7, or an Operator, subject to Section 9.3.6.11, may at any time request a change to an Approved Maintenance Outage. An Operator may, as provided in Section 9.3.6.3, schedule with the CAISO Outage Coordination Office a Maintenance Outage on its system, subject to the conditions of Sections 9.3.6.4.1, 9.3.6.8, and 9.3.6.9.

\* \* \*

#### **11.10.1.1.1 Congestion Charges for Day-Ahead Intertie Ancillary Service Awards**

Suppliers of Day-Ahead Ancillary Services Awards and qualified Self-Provided Ancillary Services over the Interties, including Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area, also are charged for Congestion if the Ancillary Service Award or the qualified Self-Provided Ancillary Service is at a congested Scheduling Point. The charge shall be equal to the Shadow Price of the applicable congested Scheduling Point multiplied by the quantity of the Ancillary Service Award or the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period; provided, however, that no such charge for Congestion will apply to any qualified Self-Provided Ancillary Service that is within the entitlement of an Existing Right, Converted Right or Transmission Ownership Right.

#### **11.10.1.2.1 Congestion Charges**

-If a Scheduling Coordinator, including a Scheduling Coordinator for a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area, receives an Ancillary Services Award or provides a qualified Self-Provided Ancillary Service at a congested Scheduling Point, the CAISO will charge the Scheduling Coordinator for Congestion. The charge for Congestion at such locations is equal to the simple average of the fifteen (15) minute applicable intertie constraint Shadow Price over the applicable Trading Hour at the location of the Ancillary Service Award, multiplied by the quantity of Ancillary Services Award or the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period. No such charge for Congestion will apply when Scheduling Coordinator's HASP Ancillary Services Awards and qualified Self-Provided Ancillary Services at Scheduling Points are provided pursuant to the CAISO Tariff rules that apply to Existing Rights and Transmission Ownership Rights.

\* \* \*

**11.10.1.3.1 Congestion Charges for Real-Time Intertie Ancillary Service Awards from Dynamic System Resources and Pseudo-Ties**

-For each Settlement Period, the suppliers of Real-Time Ancillary Services Awards, Ancillary Services from Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area,- or qualified Self-Provided Ancillary Services at Scheduling Points for Dynamic System Resources shall be charged for Congestion and such charge shall be equal to the simple average of the fifteen (15) minute Shadow Prices at the applicable Scheduling Point for the applicable Trading Hour for the awarded or Self-Provided Ancillary Service multiplied by the quantity of the Ancillary Service Award for the capacity of the qualified Self-Provided Ancillary Service for the Settlement Period; provided, however, that no such charge for Congestion will apply to any qualified Self-Provided Ancillary Service that is within the entitlements of an Existing Right or Transmission Ownership Right.

\* \* \*

**11.10.9.1 Rescission Undispatchable AS**

If a Scheduling Coordinator has Undispatchable Capacity that it is obligated to supply to the CAISO during a Settlement Interval, the Ancillary Service capacity payment for the amount of Energy that cannot be delivered from the Generating Unit, Participating Load, Proxy Demand Resource, System Unit or System Resource for the Settlement Interval shall be rescinded; provided, however, that to the extent an Ancillary Service procured in the IFM from a System Resource or a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area becomes Undispatchable Capacity due to an Intertie transmission derate before the Operating Hour for which it was procured, in rescinding the Ancillary Service capacity payment, the CAISO shall credit back to the Scheduling Coordinator any charge for Congestion assessed pursuant to Section 11.10.1.1.1, but at the lower of the Day-Ahead and simple average of the fifteen (15) minute Real-Time Shadow Price over the applicable Trading Hour on the corresponding Intertie.

\* \* \*

### **16.5.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with CAISO Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of Existing Contracts, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, holders of Existing Rights must follow CAISO operating orders even if those operating orders directly conflict with the terms of Existing Contracts, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the HASP or Real-Time Market.

\* \* \*

### **17.2.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with the CAISO's Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of TORs, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, to enable the CAISO to exercise its responsibilities as Balancing Authority in accordance with Applicable Reliability Criteria, holders of TORs must follow CAISO operating orders even if those

operating orders directly conflict with the terms of applicable Existing Contracts or any other contracts pertaining to the TORs, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the HASP or RTM.

\* \* \*

#### **27.5.1.1 Base Market Model used in the CAISO Markets**

Based on the FNM the CAISO creates the Base Market Model ~~(BMM)~~, which is used as the basis for formulating, as described in section 27.5.6, the individual market models used in each of the CAISO Markets to establish, enforce, and manage the Transmission Constraints associated with network facilities. The Base Market Model is derived from the FNM by (1) introducing locations for modeling ~~Intertie Schedules~~~~intertie schedules~~; and (2) introducing market resources that do not currently exist in the FNM due to their size and lack of visibility. In the Base Market Model, ~~external~~~~External~~ Balancing Authority Areas and external transmission systems are modeled to the extent necessary to support the commercial requirements of the CAISO Markets. For those portions of the FNM that are external to the CAISO Balancing Authority Area, the Base Market Model may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the market model separately from Transmission Losses within the CAISO Balancing Authority Area. As a result, the Marginal Cost of Losses in the LMPs is not affected by external losses. For portions of the Base Market Model that are external to the CAISO Balancing Authority Area, the CAISO Markets only enforce Transmission Constraints that reflect limitations of the transmission facilities and Entitlements turned over to the Operational Control of the CAISO by a Participating Transmission Owner, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. 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 ~~Unit is~~ 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 Base Market Model for network analysis purposes at the corresponding Generating Unit's physical interconnection point), taking into account any losses in the non-CAISO Controlled Grid leading to the point where Energy is delivered to CAISO Controlled Grid. Based on the Base Market Model ~~BMM~~, the market models used in each of the CAISO markets incorporate physical characteristics needed for determining Transmission Losses and model Transmission Constraints within the CAISO Balancing Authority Area, which are then 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. The Dispatch, Schedule, and LMP of a Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area refer to a PNode, or Aggregated Pricing Node, if applicable, of the resource at its physical location in the external transmission systems that are modeled in the Base Market Model, subject to the modeling of Transmission Losses in the portions of the FNM and exclusion of such Transmission Losses' effects on the LMPs that are external to the CAISO Balancing Authority Area described in this Section 27.5.1.1. The LMP price thus associated with a Dynamic System Resource or Pseudo-Tie Generating Unit will be used for Settlement of Energy and will include the Marginal Cost of Congestion and Marginal Cost of Losses components of the LMP to that Dynamic System Resource or Pseudo-Tie Generating Unit point, excluding losses and congestion external to the CAISO Balancing Authority Area, in accordance with this Section 27.5.1.1. Further, in formulating the market models for the HASP, STUC, RTUC, ~~and the~~ RTD processes, the Real-Time power flow parameters developed from the State Estimator are applied to the Base Market Model.

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### **30.7.6.2 Treatment of Ancillary Services Bids**

When Scheduling Coordinators bid into the Regulation Up, Regulation Down, Spinning Reserve, and Non-Spinning Reserve markets, they may submit Bids for the same capacity into as many of these markets as desired at the same time by providing the appropriate Bid information to the CAISO. The

CAISO optimization will evaluate AS Bids simultaneously with Energy Bids. A Scheduling Coordinator may specify that its Bid applies only the markets it desires. A Scheduling Coordinator shall also have the ability to specify different capacity prices for the Spinning Reserve, Non-Spinning Reserve, and Regulation markets. A Scheduling Coordinator providing one or more Regulation Up, Regulation Down, Spinning Reserve, or Non-Spinning Reserve services may not change the identification of the Generating Units or Proxy Demand Resources offered in the Day-Ahead Market or in the Real-Time Market for such services unless specifically approved by the CAISO (except with respect to System Units, if any, in which case Scheduling Coordinators are required to identify and disclose the resource specific information for all Generating Units, Participating Loads, and Proxy Demand Resources constituting the System Unit for which Bids and Submissions to Self-Provide Ancillary Services are submitted into the CAISO's Day-Ahead Market and Real-Time Market).

The following principles will apply in the treatment of Ancillary Services Bids in the CAISO Markets:

- (a) not differentiate between bidders for Ancillary Services and Energy other than through cost, price, effectiveness, and capability to provide the Ancillary Service or Energy, and the required locational mix of Ancillary Services;
- (b) select the bidders with most cost effective Bids for Ancillary Service capacity which meet its technical requirements, including location and operating capability to minimize the costs to users of the CAISO Controlled Grid;
- (c) evaluate the Day-Ahead Bids over the twenty-four (24) Settlement Periods of the following Trading Day along with Energy, taking into account Transmission Constraints and AS Regional Limits;
- (d) evaluate Import Bids along with Bids from internal resources (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area);
- (e) establish Real-Time Ancillary Service Awards through RTUC from imports and resources internal to the CAISO Balancing Authority Area (which includes



Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) at fifteen (15) minutes intervals to the hour of operation; and

- (f) procure sufficient Ancillary Services in the Day-Ahead and Real-Time Markets to meet its forecasted requirements.

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### **33.6 HASP Results**

The CAISO publishes the binding HASP Intertie Schedules and HASP AS Awards for System Resources, as well as HASP Advisory Schedules and HASP AS Awards for internal Generating Units (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area) no later than forty-five (45) minutes prior to the Trading Hour.

\* \* \*

### **34.11.2 Failure To Conform To Dispatch Instructions**

In the event that, in carrying out the Dispatch Instruction, an unforeseen problem arises (relating to plant operations or equipment, personnel or the public safety), the recipient of the Dispatch Instruction must notify the CAISO or, in the case of a Generator, the relevant Scheduling Coordinator immediately. The relevant Scheduling Coordinator shall notify the CAISO of the problem immediately. If a resource is unavailable or incapable of responding to a Dispatch Instruction, or fails to respond to a Dispatch Instruction in accordance with its terms, the resource shall be considered to be non-conforming to the Dispatch Instruction unless the resource has notified the CAISO of an event that prevents it from performing its obligations within thirty (30) minutes of the onset of such event through a SLIC log entry. Notification of non-compliance via the Automated Dispatch System (ADS) will not supplant nor serve as the official notification mechanism to the CAISO. If the resource is considered to be non-conforming as described above, the Scheduling Coordinator for the resource concerned shall be subject to Uninstructed Imbalance Energy as specified in Section 11.5.2 and Uninstructed Deviation Penalties as specified in Section 11.23. This applies whether any Ancillary Services concerned are contracted or Self-Provided. For a Non-Dynamic System Resource Dispatch Instruction prior to the Trading Hour, the Scheduling Coordinator shall inform the CAISO of its ability to conform to a Dispatch Instruction via ADS. The Non-

Dynamic System Resource has the option to accept, partially accept, or decline the Dispatch Instruction, but in any case must respond within the timeframe specified in a Business Practice Manual. The Non-Dynamic System Resource can change its response within the indicated timeframe. If a Non-Dynamic System Resource does not respond within the indicated timeframe, the Dispatch Instruction will be considered declined. A decline of such a Non-Dynamic System Resource for a Dispatch Instruction received at least forty (40) minutes prior to the Trading Hour will be subject to Uninstructed Deviation Penalties as specific in Section 11.23. A decline of such a Non-Dynamic System Resource for a Dispatch Instruction received less than forty (40) minutes prior to the Trading Hour will not be subject to Uninstructed Deviation Penalties. A Non-Dynamic System Resource that only partially accepts a Dispatch Instruction is subject to Uninstructed Deviation Penalties for the portion of the Dispatch Instruction that is declined.

When a resource demonstrates that it is not following Dispatch Instructions, the RTM will no longer assume that the resource will ramp from its current output level. The RTM assumes the resource to be "non-compliant" if it is deviating its five (5)-minute Ramping capability for more than N intervals by a magnitude determined by the CAISO based on its determination that it is necessary to improve the calculation of the expected Imbalance Energy as further defined in the BPM. When a resource is identified as "non-compliant," RTM will set the Dispatch operating target for that resource equal to its actual output in the Market Clearing software such that the persistent error does not cause excessive AGC action and consequently require CAISO to take additional action to comply with reliability requirements. Such a resource will be considered to have returned to compliance when the resource's State Estimator or telemetry value (whichever is applicable) is within the above specified criteria. During the time when the resource is "non-compliant", the last applicable Dispatch target shall be communicated to the Scheduling Coordinator as the Dispatch operating target. The last applicable Dispatch target may be (i) the last Dispatch operating target within the current Trading Hour that was instructed prior to the resource becoming "non-compliant," or (ii) the Day-Ahead Schedule, or (iii) the HASP Self-Schedule depending on whether the resource submitted a Bid and the length of time the resource was "non-compliant," or (iv) for a Dynamic System Resource or a Pseudo-Tie Generating Unit that is an Eligible Intermittent Resource, the most recently available telemetry for the actual output.

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#### **40.8.1.6 Wind and Solar**

As used in this Section, wind units are those wind ~~generating units~~Generating Units without backup sources of Generation and solar units are those solar ~~generating units~~Generating Units without backup sources of Generation. Wind and solar units, other than Qualifying Facilities with effective contracts under the Public Utility Regulatory Policies Act, must be Participating Intermittent Resources or subject to availability provisions of Section 40.6.4.3.4.

The Qualifying Capacity of all wind or solar units, including Qualifying Facilities, for each month will be based on their monthly historic performance during that same month during the hours of noon to 6:00 p.m., using a three-year rolling average. For wind or solar units with less than three years operating history, all months for which there is no historic performance data will utilize the monthly average production factor of all units (wind or solar, as applicable) within the TAC Area, or other production data from another area determined by the CAISO to be appropriate if the unit is not within a TAC Area, in which the generating unit in which the ~~Generating Unit~~ is located.

\* \* \*

#### **40.8.1.12 System Resources and Pseudo-Ties**

##### **40.8.1.12.1 Dynamic System Resources and Pseudo-Ties**

Dynamic System Resources and Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area shall be treated similar to resources within the CAISO Balancing Authority Area, except with respect to the deliverability screen under Section 40.4.6.1 and with respect to the limitation on the Qualifying Capacity of wind and solar resources set forth in Section 40.8.1.6.- However, eligibility as a Resource Adequacy Resource is contingent upon a showing by the Scheduling Coordinator that the Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area has secured transmission through any intervening Balancing Authority Areas for the Operating Hours that cannot be curtailed for economic reasons or bumped by higher priority transmission and that the Load Serving Entity for which the Scheduling Coordinator is submitting Demand Bids has an allocation of

import capacity at the import Scheduling Point under Section 40.4.6.2 that is not less than the Resource Adequacy Capacity provided by the Dynamic System Resource or Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area.

\* \* \*

#### **40.9.4.2.1 Substitute Capacity**

A Scheduling Coordinator may substitute capacity that is not Resource Adequacy Capacity for its Resource Adequacy Capacity that is on a Forced Outage or de-rate in order to mitigate the impact of the Forced Outage or de-rate on its availability calculation. Such substitution will be accepted by the CAISO in accordance with the following procedures.

(1) For Local Capacity Area Resources. A Scheduling Coordinator providing Resource Adequacy Capacity to satisfy a Local Capacity Area requirement may pre-qualify alternate resources by providing a prequalification request in accordance with the form and schedule specified in the Business Practice Manual. If the alternate resource is located at the same bus as the Resource Adequacy Resource it would replace and has similar operational characteristics, the CAISO will approve the pre-qualification request as a substitute resource for use in the subsequent Resource Adequacy Compliance Year. Additionally, when a Local Capacity Area Resource Adequacy Resource subsequently has a Forced Outage or de-rate, the Scheduling Coordinator may, prior to the close of IFM, request to substitute a non-pre-qualified resource. The CAISO will grant the request if the alternate resource is (i) located at the same bus and meets the CAISO's operational needs, or (ii) if not located at the same bus, is located in the same Local Capacity Area, and which meets the CAISO's effectiveness and operational needs, including size of resource, as determined by the CAISO in its reasonable discretion.

(2) Non-Local Capacity Area Resources (Resource Adequacy Resources designated to meet system requirements). If a Resource Adequacy Resource that is not also a Local Capacity Area Resource has an outage that would count against its availability, the Scheduling Coordinator for that resource may, prior to the close of the IFM, request to substitute a non-Resource

Adequacy Resource to be used in the place of the original resource. A Scheduling Coordinator for a non-Resource Specific System Resource that has an outage that would count against its availability may, prior to the close of the IFM, request to substitute a non-Resource Adequacy Resource that is internal to the CAISO Balancing Area Authority (which does not include a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) to be used in the place of the original resource. The CAISO shall approve the request if the substitute resource provides the same MW quantity of deliverable capacity as the original Resource Adequacy Resource.

\* \* \*

#### **43.5.2 Obligation To Provide Capacity And Termination**

The decision to accept an CPM designation shall be voluntary for the Scheduling Coordinator for any resource. If the Scheduling Coordinator for a resource accepts an CPM designation, it shall be obligated to perform for the full quantity and full period of the designation with respect to the amount of CPM Capacity for which it has accepted an CPM designation. If a Participating Generator's or Participating Load's Eligible Capacity is designated under the CPM after the Participating Generator or Participating Load has filed notice to terminate its Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement or withdraw the Eligible Capacity from its Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement, and the Scheduling Coordinator for the resource agrees to provide service under the CPM, then the Scheduling Coordinator shall enter into a new Participating Generator Agreement, QF PGA, Pseudo-Tie Participating Generator Agreement, or Participating Load Agreement, as applicable, with the CAISO.

\* \* \*

## Appendix A

### Master Definition Supplement

\* \* \*

#### **- Attaining Balancing Authority Area**

The Balancing Authority Area where the output of a Pseudo-Tie generating unit is fully included for purposes of calculation of Area Control Error and meeting Balancing Authority Area load responsibilities.

\* \* \*

#### **- Dynamic Scheduling Host Balancing Authority Operating Agreement**

An agreement entered into between the CAISO and a Host Balancing Authority governing the terms of dynamic scheduling between the Host Balancing Authority and the CAISO in accordance with the Dynamic Scheduling Protocol set forth in Appendix MX, a pro forma version of which agreement is set forth in Appendix B.9.

\* \* \*

#### **- Eligible Intermittent Resource**

-A Generating Unit or Dynamic System Resource 1 MW or larger subject to a Participating Generator Agreement, ~~or~~ QF PGA, Dynamic Scheduling Agreement for Scheduling Coordinators, or Pseudo-Tie Participating Generator Agreement that is powered by wind or solar energy, except for a de minimis amount of Energy from other sources.

\* \* \*

#### **- Generating Unit**

An individual electric generator and its associated plant and apparatus whose electrical output is capable of being separately identified and metered or a Physical Scheduling Plant that, in either case, is:

(a) located within the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a generating unit to the CAISO Balancing Authority Area);;

(b) connected to the CAISO Controlled Grid, either directly or via

interconnected transmission or distribution facilities or via a Pseudo-Tie; and

(c) ~~that is~~ capable of producing and delivering net Energy (Energy in excess of a generating station's internal power requirements).

\* \* \*

**- Interruptible Imports**

-Non-firm Energy sold into the CAISO Balancing Authority Area from ~~by a Generator or~~ resource located outside the CAISO Balancing Authority Area~~Controlled Grid~~ which by contract can be interrupted or reduced at the discretion of the seller. Interruptible Imports must be submitted through Self-Schedules in the Day-Ahead Market.

\* \* \*

**- Native Balancing Authority Area**

The Balancing Authority Area where a Pseudo-Tie generating unit is physically interconnected to the electric grid.

\* \* \*

**- Node**

-A point in the Full Network Model representing a physical location within the CAISO Balancing Authority Area or the CAISO Controlled Grid, which includes the Load and Generating Unit busses in the CAISO Balancing Authority Area (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) and at the Intertie busses between the CAISO Balancing Authority Area and interconnected Balancing Authority Areas.

\* \* \*

**- Participating Generator**

A Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the CAISO Controlled Grid (1) from a Generating Unit with a rated capacity of 1 MW or greater, (2) from a Generating Unit with a rated capacity of from 500 kW up to 1 MW for which the Generator elects to be a Participating Generator, or (3) from a Generating Unit providing Ancillary Services or submitting Energy Bids through an aggregation arrangement approved by the CAISO, which has undertaken to be bound by the terms of the CAISO Tariff, in the case of a Generator through a Participating Generator Agreement, QF PGA, or Pseudo-Tie Participating Generator Agreement~~or QF PGA.~~

\* \* \*

**- Pseudo-Tie**

A functionality by which the output of a generating unit physically interconnected to the electric grid in a Native Balancing Authority Area is telemetered to and deemed to be produced in an Attaining Balancing Authority Area that provides Balancing Authority services for and exercises Balancing Authority jurisdiction over the Pseudo-Tie generating unit.

**- Pseudo-Tie Participating Generator Agreement**

An agreement between the CAISO and a Participating Generator with a Pseudo-Tie Generating Unit, a pro forma version of which is set forth in Appendix B.16.

\* \* \*

**- Wheeling Out**

Except for Existing Rights exercised under an Existing Contract in accordance with Section 16.1, the use of the CAISO Controlled Grid for the transmission of Energy from a Generating Unit located within the CAISO Controlled Grid (which includes a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area) to serve a Load located outside the transmission and Distribution System of a Participating TO.

\* \* \*



## Appendix B.5

### Dynamic Scheduling Agreement For SCs

**THIS AGREEMENT** is dated this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ and is entered into, by and between:

(1) **[Full Legal Name]** having its registered and principal place of business located at **[Address]** (the "Scheduling Coordinator");

and

(2) **California Independent System Operator Corporation**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way~~initially 151 Blue Ravine Road~~, Folsom, California 95630 (the "CAISO").

The Scheduling Coordinator and the CAISO are hereinafter referred to as the "Parties."

#### Whereas:

- A. The CAISO Tariff provides that a Scheduling Coordinator may submit Dynamic Schedules to the CAISO from System Resources.
- B. The Scheduling Coordinator is currently Scheduling Coordinator for a System Resource associated with a power plant(s) interconnected in a Balancing Authority Area other than the CAISO Balancing Authority Area (the "Host Balancing Authority Area").
- C. The Scheduling Coordinator wishes to implement and operate a dynamic functionality that allows bidding dynamically from a System Resource into the CAISO Balancing Authority Area from the Host Balancing Authority Area and, therefore, wishes to undertake to the CAISO that it will comply with the applicable provisions of the CAISO Tariff.
- D. The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Scheduling Coordinator will discharge their respective duties and responsibilities under the CAISO Tariff.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

## ARTICLE I

### DEFINITIONS AND INTERPRETATION

- 1.1 **Master Definitions Supplement.** All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement to the CAISO Tariff.
- 1.2 **Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, the CAISO Tariff will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) “includes” or “including” shall mean “including without limitation”;
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a “person” includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## ARTICLE II

### ACKNOWLEDGEMENTS OF SCHEDULING COORDINATOR AND CAISO

- 2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledges that the CAISO may not be able to satisfy fully these responsibilities if the Scheduling Coordinator fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.

## ARTICLE III

### TERM AND TERMINATION

**3.1 Effective Date.** This Agreement shall be effective as of the date set forth above, unless accepted for filing and made effective by FERC on some other date, if FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.

## **3.2 Termination**

**3.2.1 Termination by CAISO.** Subject to Section 3.2.2, the CAISO may terminate this Agreement by giving written notice of termination in the event that the CAISO's agreement with the Host Balancing Authority has terminated or the Scheduling Coordinator commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given, to the Scheduling Coordinator, written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

**3.2.2 Limitation on CAISO Termination.** Notwithstanding the provisions of Section 3.2.1, in the event of noncompliance with the provisions of the CAISO Dynamic Scheduling Protocol, set forth in Appendix ~~M~~X of the CAISO Tariff, the CAISO shall have the right to suspend or terminate this Agreement after three (3) instances of noncompliance. In the event that the CAISO determines that the Scheduling Coordinator has failed to comply with the CAISO Dynamic Scheduling Protocol, the CAISO will provide written notice to that effect to the Scheduling Coordinator, and the Scheduling Coordinator shall have seven (7) days to correct the non-compliant condition(s). If the CAISO determines that Scheduling Coordinator has not corrected the non-compliant condition(s) within seven (7) days after the third notice of noncompliance, the CAISO may, by further written notice to the Scheduling Coordinator, suspend or terminate this Agreement and the existing functionality and arrangements described herein pursuant to Section 3.2.1, but without providing for the additional thirty (30)-day cure period otherwise provided in Section 3.2.1.

**3.2.3 Termination by Scheduling Coordinator.** In the event that the Scheduling Coordinator no longer wishes to submit dynamic Bids to the CAISO, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days written notice. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or upon ninety (90) days after the CAISO's receipt of the Scheduling

Coordinator's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## ARTICLE IV

### GENERAL TERMS AND CONDITIONS

#### 4.1 Dynamic Scheduling Requirements and Obligations

- 4.1.1 The dynamic functionality established under this Agreement shall be implemented and operated in accordance with CAISO Tariff Section 4.5.4.3, other applicable provisions of the CAISO Tariff, all applicable NERC and WECC policies, requirements, and provisions, and the CAISO Dynamic Scheduling Protocol.
- 4.1.2 The maximum allowable dynamic power transfer (in MW) from the Scheduling Coordinator's System Resource(s) and from the generating resources from which it intends to dynamically schedule exports shall be as set forth in Schedule 1 and will be referred to as "PMax" in all CAISO scheduling and control systems.
- 4.1.3 The Scheduling Coordinator warrants that the power plant(s) listed in Schedule 1 is interconnected within the Host Balancing Authority Area specified in Schedule 1, placing both the plant(s) as well as the associated System Resource under the operational jurisdiction of the Host Balancing Authority.
- 4.1.4 The CAISO ~~Intertie~~ Intertie associated with the System Resource(s) and the generating resources from which it intends to dynamically schedule exports ~~are~~ set forth in Schedule 1. The Scheduling Coordinator may request, and the CAISO may agree, at its sole discretion, to change the foregoing CAISO Intertie association, subject to any limitations set forth in the CAISO Dynamic Scheduling Protocol.
- 4.1.5 ~~Dynamic~~ Unless explicitly agreed otherwise, dynamic functionalities implemented between the CAISO and the Scheduling Coordinator may provide ~~only~~ for imports from the System Resource(s) listed in Schedule 1 to the CAISO Balancing Authority Area or for exports from generating resources listed in Schedule 1 from the CAISO Balancing Authority Area.
- 4.1.6 **Identification of System Resources.** The Scheduling Coordinator has identified the System Resources and the generating resources from which it intends to dynamically schedule exports that it represents in Schedule 1.
- 4.1.7 **Notification of Changes.** Sixty (60) days prior to changing any technical information in Schedule 1, the Scheduling Coordinator shall notify the CAISO of the proposed changes. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics provided in the revised Schedule 1. Unless the Scheduling Coordinator fails to test at the values in the proposed change(s), the change will become effective upon the effective date for the next scheduled update of the CAISO's Master File, provided the Scheduling Coordinator submits the changed information by the applicable deadline and is tested by the deadline.
- 4.2 **Agreement Subject to CAISO Tariff.** The Parties will comply with all applicable provisions of the CAISO Tariff, including Sections 4.5.4.3 and 8.4.5 and the Dynamic Scheduling Protocol in

~~Appendix M, and 8.4.5.~~ This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.

#### **4.3 Obligations Relating to Ancillary Services**

**4.3.1 Submission of Bids.** When the Scheduling Coordinator submits a Bid for Ancillary Services, the Scheduling Coordinator will, by the operation of this Section 4.3.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.

### **ARTICLE V**

#### **PENALTIES AND SANCTIONS**

**5.1 Uninstructed Deviations.** ~~Except for operating emergency situations, Real-Time Energy transfers may not vary from the Day-Ahead Schedule as adjusted by any Dispatch Instructions by more than the greater of five (5) MW or three percent (3%) of the net dependable capacity (PMax) of the System Resource, integrated across a ten-minute interval. If such defined performance band is exceeded by any amount in more than five percent (5%) of the ten-minute intervals on three successive days, then such deviations shall constitute one event of non-compliance with the CAISO Dynamic Scheduling Protocol pursuant to Section 3.2.2. Deviations from Dynamic Schedules of Energy will also be subject to Uninstructed Deviation Penalties pursuant to Section 11.23 and related provisions of the CAISO Tariff.~~

**5.2 General.** The Scheduling Coordinator shall be subject to all penalties made applicable to dynamic imports from System Resources set forth in the CAISO Tariff.

### **ARTICLE VI**

#### **COSTS**

**6.1 Operating and Maintenance Costs.** The Scheduling Coordinator shall be responsible for all its costs incurred in connection with dynamic scheduling and compliance by the System Resources and the generating resources from which it intends to dynamically schedule exports identified in Schedule 1 for the purpose of meeting its obligations under this Agreement.

### **ARTICLE VII**

#### **DISPUTE RESOLUTION**

**7.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE VIII

### REPRESENTATIONS AND WARRANTIES

- 8.1 Representation and Warranties.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.

## ARTICLE IX

### LIABILITY

- 9.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE X

### UNCONTROLLABLE FORCES

- 10.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE XI

### MISCELLANEOUS

- 11.1 Assignments.** Either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.
- 11.2 Notices.** Any notice, demand or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Scheduling Coordinator and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations,

in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.

- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.
- 11.8 [NOT USED]**
- 11.9 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Scheduling Coordinator shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

**11.10 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.



**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**NAME OF SCHEDULING COORDINATOR**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**SCHEDULE 1**

**SYSTEM RESOURCES AND BALANCING AUTHORITY AREA INFORMATION**

**[Sections 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.7]**

**Description of System Resource(s), including Associated Power Plants and PMax Values, for Dynamic Imports to the CAISO Balancing Authority Area:**

**CAISO Intertie:**

**Host Balancing Authority Area:**

**Intermediary Balancing Authority Areas:**

**Description of Generating Resource(s), including Associated Power Plants and PMax Values, for Dynamic Exports from the CAISO Balancing Authority Area:**

**CAISO Intertie:**

**Receiving Balancing Authority Area:**

**Intermediary Balancing Authority Areas:**

**SCHEDULE 2**

**NOTICES**

**[Section 11.2]**

**Scheduling Coordinator**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

\* \* \*

## Appendix B.9

### DSHBA Operating Agreement (DSHBAOA)

#### THIS DYNAMIC SCHEDULING HOST BALANCING AUTHORITY OPERATING AGREEMENT

("AGREEMENT") is established this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_ and is accepted by and between:

[Full legal name] ("Host Balancing Authority"), having its registered and principal executive office at [address],

and

**California Independent System Operator Corporation** ("CAISO"), a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way~~initially 154 Blue Ravine Road~~, Folsom, California 95630.

The Host Balancing Authority and the CAISO are hereinafter referred to as the "Parties."

#### Whereas:

- A. The Parties named above operate Balancing Authority Areas.
- B. The Parties wish to coordinate operation of dynamic scheduling functionality to satisfy North American Electric Reliability Corporation ("NERC") and Western Electricity Coordinating Council ("WECC") standards and criteria and Good Utility Practice.
- C. The Host Balancing Authority ~~does not have an Interconnected Balancing Authority Area Operating Agreement ("IBAAOA") with the CAISO and~~ desires to implement an agreement to facilitate dynamic scheduling from System Resources in its Balancing Authority Area to the CAISO Balancing Authority Area ~~without an IBAAOA~~.
- D. The Parties wish to enter into this Agreement to establish the terms and conditions for the operation of the dynamic scheduling functionality from Host Balancing Authority's Balancing Authority Area to the CAISO Balancing Authority Area.
- E. The CAISO has certain statutory obligations under California law to maintain power system reliability.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

#### 1. Term and Termination

##### 1.1 Effective Date

This Agreement shall be effective as of the date set forth above, unless this Agreement is accepted for filing and made effective by the Federal Energy Regulatory Commission ("FERC") on some other date, if FERC filing is required, and shall continue in effect until terminated.

##### 1.2 Termination

This Agreement may be terminated by either Party upon thirty (30) days written notice to the other Party or upon mutual consent of both Parties. For entities subject to FERC jurisdiction, termination will be effective upon acceptance by FERC of notice of termination, if this Agreement has been filed with FERC, or thirty (30) days after the date of the notice of termination by a Party, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders. The CAISO shall timely file any required notice of termination with FERC. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination with FERC within sixty (60) days after issuance of the notice of termination by a Party; or (2) the CAISO files the notice of termination with FERC in accordance with the requirements of FERC Order No. 2001.

## **2. Definitions**

### **2.1 WECC Definitions**

Except as defined below, terms and expressions used in this Agreement shall have the same meanings as those contained in the WECC Glossary of WECC Terms and Acronyms.

### **2.2 Specific Definitions**

**2.2.1 CAISO Dynamic Scheduling Protocol:** The CAISO's Dynamic Scheduling Protocol, which is set forth in Appendix MX of the CAISO Tariff.

**2.2.2 CAISO Tariff:** CAISO Operating Agreement, Protocols, and Tariff as amended from time to time, together with any appendices or attachments thereto.

**2.2.3 Good Utility Practice:** Any of the practices, methods, and acts engaged in or approved by a significant portion of the electric utility industry in the WECC region during the relevant time period, or any of the practices, methods, and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. Good Utility Practice is not intended to be any one of a number of the optimum practices, methods, or acts to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

**2.2.4 Point of Contact:** A person or entity having the authority to receive and act upon scheduling or dispatch communications from the other Balancing Authority and available through a communications device mutually agreed upon on a 24-hour, 7-day basis.

**2.2.5 Scheduling Coordinator:** An entity certified by the CAISO for the purposes of undertaking the functions of: submitting bids or schedules for energy, generation, transmission losses, and ancillary services; coordinating generation; tracking, billing, and settling trades with other Scheduling Coordinators; submitting forecast information; paying the CAISO's charges; and ensuring compliance with CAISO protocols.

**2.2.6 System Resource:** "System Resource" is defined in the CAISO Tariff and, in the context of this Agreement, may include combinations of resources as described in the CAISO Dynamic Scheduling Protocol.

### **3 General**

#### **3.1 Purpose**

This Agreement sets forth the requirements that must be satisfied by the Host Balancing Authority should it elect to support Scheduling Coordinators' requests for implementation of a dynamic scheduling functionality and delivery of energy and energy associated with ancillary services (except regulation service) into the CAISO Balancing Authority Area. The requirements encompass technical (energy management system ("EMS"),<sup>1</sup> automatic generation control ("AGC"),<sup>2</sup> and communications), interchange scheduling, telemetry, and aspects of Balancing Authority Area operations.

#### **3.2 NERC/WECC Operating Standards Observed**

Nothing in this Agreement is intended to change, supersede, or alter either Party's obligations to abide by NERC and WECC reliability standards and policies and WECC criteria.

#### **3.3 Applicable Standards**

This Agreement incorporates, by reference, the CAISO Dynamic Scheduling Protocol.

#### **3.4 Communication**

The CAISO and the Host Balancing Authority shall each operate and maintain a 24-hour, 7-day control center with real-time scheduling and control functions. Appropriate control center staff will be provided by each Party who shall be responsible for operational communications and who shall have sufficient authority to commit and bind that Party. The CAISO and the Host Balancing Authority shall jointly develop communication procedures necessary to support scheduling and dispatch functions. The Parties agree to exchange operational contact information in a format to be provided by the CAISO and completed as of the effective date of this Agreement. Each Party shall provide the other Party ten (10) calendar days advance notice of updates to its operational contact information is expected to change.

### **4. Telecommunications Requirements**

The CAISO and Host Balancing Authority shall establish and maintain real-time, redundant, diversely routed, communications links between the CAISO EMS and the Host Balancing Authority EMS, with the primary link utilizing the standard inter-control center communications protocol ("ICCP") in accordance with the CAISO Dynamic Scheduling Protocol for the dynamically scheduled System Resources listed in Schedule 2.

### **5. Telemetry**

For each operating hour for which a System Resource is scheduled to deliver energy, and/or energy associated with any of the non-regulating ancillary services to the CAISO Balancing Authority Area, the Host Balancing Authority shall provide, via the ICCP communication links to the CAISO EMS, the data for each System Resource, as set forth in the CAISO Dynamic Scheduling Protocol.

### **6. Interchange Scheduling Requirements**

## **6.1 Dynamic Scheduling**

The Host Balancing Authority shall support Scheduling Coordinators' requests to arrange dynamic interchange schedules for the delivery of energy to the CAISO Balancing Authority Area, reflecting the System Resource's instantaneous energy production or allocation level and taking into account available transmission capacity.

## **6.2 Treatment of Area Control Error ("ACE")**

The Host Balancing Authority shall instantaneously compensate its AGC for the System Resource's energy output that is generated or allocated for establishing the dynamic schedule to the CAISO such that the System Resource energy production or allocation changes have an equal in magnitude and opposite in sign effect on the Host Balancing Authority's ACE.

## **6.3 Integration of Dynamic Scheduling**

For each operating hour during which energy was dynamically scheduled for delivery to the CAISO Balancing Authority Area, the Host Balancing Authority shall compute an integrated amount of interchange based on the System Resource's integrated energy production, by integrating the instantaneous System Resource production levels. Such integrated MWH value shall be agreed to hourly by the real-time schedulers.

## **6.4 Delivery of Megawatts ("MW")**

The CAISO and the Host Balancing Authority will share in the real time deviations from the dynamic, non-regulation ancillary services and energy from the dynamic System Resource, for which the CAISO's maximum responsibility will be on a pro rata basis. The Host Balancing Authority will remain responsible for regulation obligation for the portion of the System Resource's output not dynamically scheduled into the CAISO Balancing Authority Area in accordance with WECC and NERC reliability standards.

~~The Host Balancing Authority shall not be obligated to make up any difference between the dynamic energy schedule and the MW being generated or allocated by the System Resource.~~

## **6.5 Access to Information**

The Parties agree to exchange information related to telemetry sent and received with respect to the delivery of energy (i) at the request of the other Party for purposes of after-the-fact interchange accounting or (ii) on demand for any other purpose.

## **7. Other Host Balancing Authority Responsibilities**

### **7.1 Operational Jurisdiction**

The Host Balancing Authority will have, at a minimum, the level of operational jurisdiction over the System Resource and the associated dynamic schedule that NERC and WECC vest in Host Balancing Authorities.

### **7.2 E-Tagging**



The Host Balancing Authority must support associated e-tagging as described in the CAISO Dynamic Scheduling Protocol and deemed to be consistent with NERC and/or WECC requirements.

### **7.3 Real-Time Adjustments**

The Host Balancing Authority must have a means to manually override and/or otherwise adjust the dynamic signal in real-time, if needed.

### **7.4 Coordination with Other Balancing Authorities**

The Host Balancing Authority must provide in real-time the instantaneous value of each dynamic schedule to every intermediary Balancing Authority Area through whose systems such dynamic schedule may be implemented to the CAISO.

## **8. Other**

### **8.1 Losses**

The CAISO shall not be responsible for transmission losses caused by transmitting energy dynamically within or across the Host Balancing Authority's Balancing Authority Area for delivery to the CAISO.

### **8.2 Certification**

Only CAISO-certified System Resource/Host Balancing Authority arrangements will be allowed to bid or self provide ancillary services in the CAISO's ancillary services market through a CAISO-certified Scheduling Coordinator.

### **8.3 No Guarantee of Award**

Certification of a System Resource/Host Balancing Authority arrangement allows for bidding of energy and/or certain ancillary services into the CAISO market; it does not, however, guarantee selection of such bid.

### **8.4 Performance Assessment**

The CAISO will monitor and measure dynamically imported ancillary services, whether bid or self-provided, against the performance benchmarks described in the CAISO Dynamic Scheduling Protocol.

### **8.5 Description of System Resources**

Each dynamically scheduled System Resource permitted pursuant to this Agreement is described in Schedule 2.

## **9. Notifications**

The CAISO and the Host Balancing Authority shall jointly develop methods for coordinating the notification of all affected scheduling entities within their respective Balancing Authority Areas regarding schedule changes in emergency or curtailment conditions.

## **10 Liability**

### **10.1 Uncontrollable Forces**

An Uncontrollable Force means any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm, flood, earthquake, explosion, any curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond the reasonable control of a Balancing Authority which could not be avoided through the exercise of Good Utility Practice.

Neither the CAISO nor the Host Balancing Authority will be considered in default of any obligation under this Agreement or liable to the other for direct, indirect, and consequential damages if prevented from fulfilling that obligation due to the occurrence of an Uncontrollable Force. Neither the CAISO nor the Host Balancing Authority will be considered in default of any obligation under this Agreement to the extent caused by any act, or failure to act, of any intermediary Balancing Authority.

In the event of the occurrence of an Uncontrollable Force, which prevents either the CAISO or the Host Balancing Authority from performing any obligations under this Agreement, the affected entity shall not be entitled to suspend performance of its obligations in any greater scope or for any longer duration than is required by the Uncontrollable Force. The CAISO and the Host Balancing Authority shall each use its best efforts to mitigate the effects of such Uncontrollable Force, remedy its inability to perform, and resume full performance of its obligations hereunder.

### **10.2 Liability To Third Parties**

Except as otherwise expressly provided herein, nothing in this Agreement shall be construed or deemed to confer any right or benefit on, or to create any duty to, or standard of care with reference to any third party, or any liability or obligation, contractual or otherwise, on the part of CAISO or the Host Balancing Authority.

### **10.3 Liability Between the Parties**

The Parties' duties and standard of care with respect to each other, and the benefits and rights conferred on each other, shall be no greater than as explicitly stated herein. Neither Party, its directors, officers, employees, or agents, shall be liable to the other Party for any loss, damage, claim, cost, charge, or expense, whether direct, indirect, or consequential, arising from the Party's performance or nonperformance under this Agreement, except for a Party's gross negligence, or willful misconduct.

## **11 Miscellaneous**

### **11.1 Assignments**

Either Party to this Agreement may assign its obligations under this Agreement, with the other Party's prior written consent. Such consent shall not be unreasonably withheld.

Obligations and liabilities under this Agreement shall be binding on the successors and assigns of the Parties. No assignment of this Agreement shall relieve the assigning Party from any obligation or liability under this Agreement arising or accruing prior to the date of assignment.

## **11.2 Notices**

Any notice, demand, or request which may be given to or made upon either Party regarding this Agreement shall be made in writing and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 3 and shall be deemed properly served, given, or made: (a) upon delivery if delivered in person, (b) five (5) days after deposit in the mail if sent by first class United States mail, postage prepaid, (c) upon receipt of confirmation by return facsimile if sent by facsimile, or (d) upon delivery if delivered by prepaid commercial courier service. A Party must update the information in Schedule 3 relating to its address as that information changes. Such changes shall not constitute an amendment to this Agreement.

## **11.3 Waivers**

Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or matter arising in connection with this Agreement. Any delay short of the statutory period of limitations, in asserting or enforcing any right under this Agreement, shall not constitute or be deemed a waiver of such right.

## **11.4 Governing Law and Forum**

Subject to Section 11.5, this Agreement shall be deemed to be a contract made under and for all purposes shall be governed by and construed in accordance with the laws of the State of California. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement shall be brought in any of the following forums, as appropriate: a court of the State of California or any federal court of the United States of America located in the State of California or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission. No provision of this Agreement shall be deemed to waive the right of any Party to protest, or challenge in any manner, whether this Agreement, or any action or proceeding arising under or relating to this Agreement, is subject to the jurisdiction of the Federal Energy Regulatory Commission.

## **11.5 Consistency with Federal Laws and Regulations**

(a) Nothing in this Agreement shall compel any person or federal entity to: (1) violate federal statutes or regulations; or (2) in the case of a federal agency, to exceed its statutory authority, as defined by any applicable federal statutes, regulations, or orders lawfully promulgated thereunder. If any provision of this Agreement is inconsistent with any obligation imposed on any person or federal entity by federal law or regulation to that extent, it shall be inapplicable to that person or federal entity. No person or federal entity shall incur any liability by failing to comply with any provision of this Agreement that is inapplicable to it by reason of being inconsistent with any federal statutes, regulations, or orders lawfully promulgated thereunder; provided, however, that such person or federal entity shall use its best efforts to comply with the CAISO Tariff to the extent that applicable federal laws, regulations, and orders lawfully promulgated thereunder permit it to do so.

(b) If any provision of this Agreement requiring any person or federal entity to give an indemnity or impose a sanction on any person is unenforceable against a federal entity, the CAISO

shall submit to the Secretary of Energy or other appropriate Departmental Secretary a report of any circumstances that would, but for this provision, have rendered a federal entity liable to indemnify any person or incur a sanction and may request the Secretary of Energy or other appropriate Departmental Secretary to take such steps as are necessary to give effect to any provisions of this Agreement that are not enforceable against the federal entity.

#### **11.6 Severability**

If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

#### **11.7 Section Headings**

Section headings provided in this Agreement are for ease of reading and are not meant to interpret the text in each Section.

#### **11.8 Amendments**

This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that are subject to FERC approval shall not take effect until FERC has accepted such amendments for filing and has made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO or the Host Balancing Authority to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

#### **11.9 Counterparts**

This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date first written above.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**[Full legal name of Host Balancing Authority]**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**SCHEDULE 1**

**[NOT USED]**

**SCHEDULE 2**

**DESCRIPTION OF DYNAMICALLY SCHEDULED SYSTEM RESOURCES**

**[Section 4]**

**SCHEDULE 3**

**NOTICES**

**[Section 11.2]**

**Host Balancing Authority**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_



**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

\* \* \*

**B.16**

**Pseudo-Tie Participating Generator Agreement**

**THIS AGREEMENT** is dated this \_\_\_\_\_ day of \_\_\_\_\_, and is entered into, by and between:

(1) **[Full Legal Name]** having its registered and principal place of business located at **[Address]** (the "Participating Generator");

and

(2) **California Independent System Operator Corporation**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, currently 250 Outcropping Way, Folsom, California 95630 (the "CAISO").

The Participating Generator and the CAISO are hereinafter referred to as the "Parties."

**Whereas:**

- A.** The CAISO Tariff provides that the CAISO shall not accept Bids for Energy or Ancillary Services generated by any Generating Unit otherwise than through a Scheduling Coordinator.
- B.** The CAISO Tariff further provides that the CAISO shall not be obliged to accept Bids relating to Generation from any Generating Unit unless the relevant Generator undertakes in writing to the CAISO to comply with all applicable provisions of the CAISO Tariff.
- C.** The Participating Generator owns a Generating Unit physically interconnected in a Native Balancing Authority Area other than the CAISO Balancing Authority Area.
- D.** The Participating Generator and the CAISO wish to implement and operate a Pseudo-Tie for the Generating Unit to allow the Participating Generator to submit Self-Schedules and Bids for Energy and Ancillary Services to the CAISO through a Scheduling Coordinator dynamically from the Pseudo-Tie into the CAISO Balancing Authority Area from the Native Balancing Authority Area.
- E.** The Participating Generator wishes to undertake to the CAISO that it will comply with the applicable provisions of the CAISO Tariff that are applicable to a Participating Generator with a Pseudo-Tie.
- F.** The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Participating Generator will discharge their respective duties and responsibilities under the CAISO Tariff.

**NOW THEREFORE**, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

**ARTICLE I**  
**DEFINITIONS AND INTERPRETATION**

**1.1 Master Definitions Supplement.** All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement to the CAISO Tariff.

**1.2 Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, this Agreement will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) “includes” or “including” shall mean “including without limitation”;
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a “person” includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## **ARTICLE II** **ACKNOWLEDGEMENTS OF PARTICIPATING GENERATOR AND CAISO**

**2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid and the CAISO Balancing Authority Area consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledges that the CAISO may not be able to satisfy fully these responsibilities if the Participating Generator fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.

## **ARTICLE III** **TERM AND TERMINATION**

**3.1 Effective Date.** This Agreement shall be effective as of the later of the date it is executed by the Parties or the date accepted for filing and made effective by FERC, if such FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.

**3.2 Termination**

**3.2.1 Termination by CAISO.** Subject to Section 5.2, the CAISO reserves the right to suspend or terminate this Agreement in the event the CAISO reasonably determines that the Pseudo-Tie established under this Agreement poses a risk to System Reliability or the risk of a violation of Applicable Reliability Criteria, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement, by giving immediate notice of suspension or thirty (30) days advance written notice of termination. Additionally, the CAISO may terminate this Agreement by giving written notice of termination in the event that the Native Balancing Authority provides notice to the CAISO of its withdrawal from its agreement with the CAISO to participate in the Pseudo-Tie arrangement or the Participating Generator commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given the Participating Generator written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement. With respect to any notice of termination or default given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement was filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default or termination to the Participating Generator; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default or termination to the Participating Generator, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

**3.2.2 Termination by Participating Generator.** In the event that the Participating Generator no longer wishes to be considered part of the CAISO Balancing Authority Area, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days advance written notice. With respect to any notice of termination given by the Participating Generator pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or ninety (90) days after the CAISO's receipt of the Participating Generator's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## **ARTICLE IV** **GENERAL TERMS AND CONDITIONS**

### **4.1 Pseudo-Tie Requirements and Participating Generator Obligations**

**4.1.1** The Pseudo-Tie established under this Agreement shall be implemented and operated in accordance with this Agreement, Appendix N and other applicable provisions of the CAISO Tariff, the operating agreement between the CAISO and the Balancing Authority for the Native Balancing Authority Area for the Generating Unit, and all applicable NERC and WECC reliability standards, policies, requirements, and provisions.

**4.1.2** The technical characteristics of the Generating Unit and associated Pseudo-Tie are set forth in Schedule 1. The Participating Generator may request, and the CAISO may agree, at its sole discretion, to change the CAISO Intertie association.

4.1.3 Any unique characteristics of the Pseudo-Tie to the CAISO Balancing Authority Area from the Participating Generator's Generating Unit are set forth in Schedule 1.

4.1.4 **Notification of Changes.** Sixty (60) days prior to changing any technical information in Schedule 1, the Participating Generator shall notify the CAISO of the proposed changes. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics provided in the revised Schedule 1. The CAISO shall post on the CAISO Website a schedule showing, for at least one year in advance: (i) the proposed dates on which the CAISO's Master File will be updated, which dates shall occur at least every three months; (ii) the dates on which the information contained in the revised Master File will become effective; and (iii) the deadlines by which changed technical information must be submitted to the CAISO in order to be tested and included in the next scheduled update of the CAISO's Master File. Unless the Participating Generator fails to test at the values in the proposed change(s), the change will become effective upon the effective date for the next scheduled update of the CAISO's Master File, provided the Participating Generator submits the changed information by the applicable deadline and is tested by the deadline. Subject to such notification, this Agreement shall not apply to any generating unit identified in Schedule 1 which the Participating Generator no longer owns or no longer has contractual entitlement to.

4.2 **Agreement Subject to CAISO Tariff.** The Parties will comply with all applicable provisions of the CAISO Tariff. This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.

#### 4.3 **Obligations Relating to Ancillary Services.**

4.3.1 **Submission of Bids.** When the Scheduling Coordinator on behalf of the Participating Generator submits a Bid for Ancillary Services, the Participating Generator will, by the operation of this Section 4.3.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.

4.3.2 **Certification.** The Participating Generator shall not use a Scheduling Coordinator to submit a Bid for the provision of an Ancillary Service or submit a Submission to Self-Provide an Ancillary Service unless the Scheduling Coordinator serving that Participating Generator is in possession of a current certificate pursuant to Sections 8.3.4 and 8.4 of the CAISO Tariff.

#### 4.4 **Obligations relating to Major Incidents.**

4.4.1 **Major Incident Reports.** The Participating Generator shall promptly provide such information as the CAISO may reasonably request in relation to major incidents, in accordance with Section 4.6.7.3 of the CAISO Tariff.

## ARTICLE V PENALTIES AND SANCTIONS

5.1 **General.** The Participating Generator shall be subject to all penalties made applicable to Participating Generators within the CAISO Balancing Authority Area. No penalties or sanctions may be imposed under this Agreement unless a Schedule or CAISO Tariff provision providing for such penalties or sanctions has first been filed with and made effective by FERC. Nothing in the Agreement, with the exception of the provisions relating to the CAISO ADR Procedures, shall be construed as waiving the rights of the Participating Generator to oppose or protest any penalty proposed by the CAISO to the FERC or the specific imposition by the CAISO of any FERC-approved penalty on the Participating Generator.

**5.2 Corrective Measures.** If the Participating Generator fails to meet or maintain the requirements set forth in this Agreement and/or the CAISO Tariff, the CAISO shall be permitted to take any of the measures, contained or referenced in the CAISO Tariff, which the CAISO deems to be necessary to correct the situation.

#### **ARTICLE VI** **COSTS**

**6.1 Operating and Maintenance Costs.** The Participating Generator shall be responsible for all its costs incurred for the purpose of meeting its obligations under this Agreement.

#### **ARTICLE VII** **DISPUTE RESOLUTION**

**7.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

#### **ARTICLE VIII** **REPRESENTATIONS AND WARRANTIES**

**8.1 Representation and Warranties.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.

#### **ARTICLE IX** **LIABILITY**

**9.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

#### **ARTICLE X** **UNCONTROLLABLE FORCES**

**10.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement.

#### **ARTICLE XI** **MISCELLANEOUS**

**11.1 Assignments.** Subject to Section 3.2.1 of this Agreement, either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written

consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.

- 11.2 Notices.** Any notice, demand or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Participating Generator and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waivers at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.
- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereto and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.
- 11.8 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing contained herein shall be construed as affecting in any way the right of the CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Participating Generator shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any

proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

**11.9 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF,** the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**[NAME OF PARTICIPATING GENERATOR]**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_



**SCHEDULE 1**

**(The following page is a placeholder for Schedule 1, which contains the GENERATING UNIT, PSEUDO-TIE, AND NATIVE BALANCING AUTHORITY AREA Technical Information and Other Unique Characteristics [Sections 4.1.2 and 4.1.3])**

**SCHEDULE 2**

**NOTICES**  
**[Section 11.2]**

**Participating Generator**

Name of Primary  
Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative  
Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

\* \* \*

## Appendix I

### Station Power Protocol

\* \* \*

#### 2.2 CAISO Monitoring and Review

2.2.1 The CAISO will take the following actions with respect to each application to establish a Station Power Portfolio:

- (a) The CAISO shall post on the CAISO Website a listing of the specific Station Power meters and Generating Units located in the CAISO Balancing Authority Area (which may include a Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area, provided that firm transmission service has been reserved across the transmission path from the CAISO Intertie to the Pseudo-Tie Generating Unit and the Station Power service is provided by a UDC or MSS Operator within the CAISO Balancing Authority Area),<sup>17</sup> and any generating facilities outside the CAISO Balancing Authority Area, that compose each Station Power Portfolio, and which are eligible to participate in the self-supply of Station Power in accordance with this SPP.
- (b) The CAISO will provide the appropriate UDC or MSS Operator and the Local Regulatory Authority with one-line diagrams and other information regarding each application.
- (c) The CAISO will make a determination in consultation with the UDC or MSS Operator and the Local Regulatory Authority on the factual question of whether distribution facilities are involved in the requested self-supply of Station Power. Any disputes regarding such determinations shall be subject to the dispute resolution procedures of this CAISO Tariff.
- (d) The CAISO will verify metering schemes and assign unique Load identifiers consistent with the CAISO data templates and validation rules that the Scheduling Coordinator responsible for each meter will be required to use for scheduling and Settlement.

\* \* \*

**Appendix M**  
**Procedures for Addressing Parallel Flows**

**Dynamic Scheduling Protocol (DSP)**

**1. DYNAMIC SCHEDULES OF IMPORTS TO THE CAISO BALANCING AUTHORITY AREA**

**1.1 CONSISTENCY WITH NERC/WECC POLICIES AND REQUIREMENTS**

**1.1.1** Scheduling and operation of Dynamic Schedule functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling, in accordance with Section 4.5.4.3 of the CAISO Tariff.

**1.2 CONTRACTUAL RELATIONSHIPS**

**1.2.1** The Host Balancing Authority must execute an operating agreement with the CAISO particular to the operation of the functionality supporting dynamic imports of Energy, and/or Energy associated with non-Regulation Ancillary Services to the CAISO Balancing Authority Area.

**1.2.2** The Scheduling Coordinator for the System Resource must execute a Dynamic Scheduling Agreement for Scheduling Coordinators with the CAISO governing the operation of the Dynamic Schedule functionality, which agreement will include a provision for its termination based on failure to comply with these standards.

**1.2.3** The Scheduling Coordinator for the System Resource must have the necessary operational and contractual arrangements in place with the Host Balancing Authority to implement Section 1.3 and other provisions of this Appendix M. Such arrangements must include the Host Balancing Authority's ability to receive telemetry from the System Resource and to issue a Dynamic Schedule signal pertinent to that System Resource to the CAISO. Proof of such arrangements must be provided to the CAISO.

**1.3 COMMUNICATIONS, TELEMETRY, AND OTHER TECHNICAL REQUIREMENTS**

**1.3.1** The communication and telemetry requirements set forth in the CAISO's Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, will apply to all Dynamic Schedules, except for (a) those dynamic functionalities established prior to the CAISO Operations Date, (b) the requirements that are specific solely to Regulation, and (c) the requirements set forth below.

**1.3.2** A dedicated primary communications link and a backup communications link between the CAISO's EMS and the Host Balancing Authority Area EMS are required.

**1.3.3** The primary circuit will be T1-class, or equivalent, utilizing the inter-control center communications protocol ("ICCP"). The backup communications link will be diversely routed between the Host Balancing Authority Area EMS and the CAISO Balancing Authority Area EMS on separate physical paths and devices, provided that the CAISO

may approve an alternative means of providing backup communications if the circumstances warrant.

**1.3.4** A dedicated primary communications link and a backup communications link between the Host Balancing Authority Area EMS and any Intermediary Balancing Authority Area EMS are required, if requested by the Intermediary Balancing Authority Area.

**1.3.5** The Balancing Authority Area hosting a Dynamic System Resource must have a mechanism implemented to override the associated dynamic signal.

**1.3.6** The dynamic signal must be properly incorporated into all involved Balancing Authority Areas' ACE equations.

**1.3.7** The System Resource must have communications links with the Host Balancing Authority Area consistent with this Appendix M.

#### **1.4 LIMITS ON DYNAMIC IMPORTS**

**1.4.1** The CAISO reserves the right to establish limits applicable to the amount of any Ancillary Services and/or Energy imported into the CAISO Balancing Authority Area, whether delivered dynamically or statically. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of, or a specific import limit applicable to, total CAISO Balancing Authority Area requirements; a percentage at, or a specific import limit applicable to, a particular Intertie or a Transmission Interface; a percentage of, or a specific import limit applicable to, total requirements in a specific Ancillary Service Region; or operating factors which may include, but are not limited to, operating Nomograms, Remedial Action Schemes, protection schemes, scheduling and curtailment procedures, or any potential single points of failure associated with the actual delivery process. The CAISO may implement a moratorium on the establishment of new Dynamic Schedules associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.

**1.4.2** The CAISO may, at its discretion, either limit or forego procuring Ancillary Services at particular Balancing Authority Area Interties to ensure that Operating Reserves are adequately dispersed throughout the CAISO Balancing Authority Area as required by NERC and WECC reliability standards and any requirements of the NRC.

**1.4.3** A Dynamic System Resource and its Dynamic Schedules must be permanently associated with a particular CAISO Intertie (the CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Dynamic System Resource with a particular CAISO Intertie).

#### **1.5 OPERATING AND SCHEDULING REQUIREMENTS**

**1.5.1** For any Operating Hour for which Ancillary Services (and associated Energy) is scheduled dynamically to the CAISO from the System Resource, firm transmission service must be reserved across the entire Dynamic Schedule transmission path external

to the CAISO Balancing Authority Area. For any Operating Hour for which only Energy is scheduled dynamically to the CAISO from the System Resource, transmission service must be reserved across the entire Dynamic Schedule transmission path external to the CAISO Balancing Authority Area, or must be available within the Operating Hour, sufficient to support the Schedule and Dispatch of the System Resource. In the event that the System Resource has not established a sufficient transmission reservation prior to the Operating Hour, and will not be able to use additional transmission within the Operating Hour, to support Dispatch up to its maximum available capacity, a derate must be reported in the CAISO's Outage management system to limit its Dispatch to its available transmission.

- 1.5.2** All Dynamic Schedules associated with Dynamic System Resources must be electronically tagged (by use of an E-Tag).
- 1.5.3** Formal inter-Balancing Authority Area Dynamic Schedules may be issued only by the Dynamic System Resource's Host Balancing Authority Area and must be routed through the EMSs of any Intermediary Balancing Authority Area, if requested by the Balancing Authority for the Intermediary Balancing Authority Area.
- 1.5.4** The CAISO will treat dynamically scheduled Energy as a resource contingent firm import. The CAISO will procure (or allow for self-provision of) Operating Reserves for Loads served by Dynamic System Resources as required by NERC and WECC reliability standards and any requirements of the NRC.
- 1.5.5** All Energy Interchange Schedules associated with dynamically scheduled imports of Spinning Reserve and Non-Spinning Reserve will be afforded similar treatment (i.e., resource contingent firm).
- 1.5.6** The dynamic signal must be integrated over time by the Host Balancing Authority Area for every Operating Hour.
- 1.5.7** Notwithstanding any Dispatches of the System Resource in accordance with the CAISO Tariff, the CAISO shall have the right to issue operating orders as defined in Section 37.2.1.1 of the CAISO Tariff to the System Resource either directly or through the Host Balancing Authority Area for emergency or contingency reasons, or to ensure the CAISO's compliance with operating requirements based on WECC or NERC requirements and policies (e.g., WECC's Unscheduled Flow Reduction Procedure). However, such operating orders may be issued only within the range of the CAISO-accepted Energy and Ancillary Services, Bids for a given Operating Hour (or the applicable "sub-hour" interval).
- 1.5.8** If there is no Dynamic Schedule in the CAISO's Day-Ahead Market or HASP/RTM, the dynamic signal must be at "zero" ("0") except when in response to CAISO's Dispatch Instructions associated with accepted Ancillary Services or Energy Bids.
- 1.5.9** The Scheduling Coordinator for the Dynamic System Resource must have the ability to override the associated Dynamic Schedule in order to respond to the operating orders of the CAISO or the Host Balancing Authority.

**1.5.10** Unless the Dynamic System Resource (1) is implemented as a directly-telemetered Load following functionality, (2) is base-loaded Regulatory Must-Take Generation, (3) responds to a CAISO intra-hour Dispatch Instruction, or (4) is an Eligible Intermittent Resource, the Dynamic Schedule representing such resource must follow WECC-approved practice of 20-minute ramps centered at the top of the hour. The CAISO does not provide any special Settlements treatment nor offer any CAISO Tariff exemptions for dynamic Load following functionalities.

**1.5.11** In Real-Time the Dynamic Schedule may not exceed the CAISO's Dispatch Operating Point. The Dispatch Operating Point represents not only the estimated Dynamic System Resource's Energy but also, in combination with any Ancillary Service Award that has not been dispatched as Energy, the transmission reservation on the associated CAISO Intertie.

**1.5.12** Only one Dynamic System Resource may be associated with any one physical generating resource, unless the CAISO approves an implementation plan to establish multiple Dynamic System Resources for that generating resource.

**1.5.13** If the Scheduling Coordinator for the Dynamic System Resource desires to participate in CAISO's Regulation market, all provisions of the CAISO's Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, shall apply.

**1.6** **CERTIFICATION, TESTING, AND PERFORMANCE MONITORING OF DYNAMIC IMPORTS OF ANCILLARY SERVICES**

Scheduling Coordinators must be certified separately for each Ancillary Service. Scheduling Coordinators that wish to be certified for imports of Regulation shall be subject to certification under the Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, subject to verification of consistency with the requirements of this Appendix M.

**1.6.1** The Scheduling Coordinator must request the certification of a System Resource to provide Ancillary Services for the CAISO Balancing Authority Area and cooperate, along with the Host Balancing Authority, in the testing of such System Resource in accordance with the CAISO Tariff and applicable CAISO Operating Procedures.

**1.6.2** Only CAISO tested and certified System Resources will be allowed to bid and/or self-provide Ancillary Services into the CAISO Balancing Authority Area.

**1.6.3** Dynamic Ancillary Services imports will be certified through testing, in accordance with the applicable CAISO Operating Procedures. All requests for certification of dynamic Ancillary Services imports will be reviewed and approved by the CAISO with respect to any technical limitations imposed by existing operational considerations, such as Remedial Action Schemes, operating Nomograms, and scheduling procedures. These reviews may impose certain Ancillary Services import limits in addition to those outlined in Section 1.4.1 of this Appendix M. Therefore, interested parties are advised and encouraged to contact the CAISO before they begin the process of the necessary



systems design, preparation, and implementation for import of Ancillary Services to the CAISO Balancing Authority Area.

**1.6.4** The CAISO will measure the performance of the Dynamic Schedule of Energy associated with an accepted Ancillary Services Bid against (1) the awarded range of Ancillary Service capacity; (2) the certified limits; and (3) the bid Ramp Rate, which shall be validated by the CAISO against the certified Ramp Rate.

**1.6.5** The Scheduling Coordinator for the System Resource must notify the CAISO should any changes, modifications, or upgrades affecting control and/or performance of the System Resource be made. Upon such notification, the CAISO, at its discretion, may require that the System Resource be re-certified to import Ancillary Services into the CAISO Balancing Authority Area.

**1.7** **COMPLIANCE, LOSSES, AND FINANCIAL SETTLEMENTS**

**1.7.1** Energy delivered in association with Dynamic System Resources will be subject to all provisions of the CAISO's Imbalance Energy markets, including Uninstructed Deviation Penalties (UDP) (just as is the case with CAISO intra- Balancing Authority Area Generating Units of Participating Generators).

**1.7.2** Dynamically scheduled and delivered Ancillary Services will be subject to the CAISO's compliance monitoring and remedies, just as any CAISO intra-Balancing Authority Area Generating Units of Participating Generators.

**1.7.3** All Day-Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real-Time (with the exception of intra-hour Dispatch Instructions of the Energy associated with accepted Ancillary Services Bids or Dispatch Instructions for Imbalance Energy).

**1.7.4** All Dynamic Schedules and delivered Energy shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.

**1.7.5** Any transmission losses attributed to the Dynamic Schedule on transmission system(s) external to the CAISO Balancing Authority Area will be the responsibility of the owner(s)/operator(s) of the Dynamic System Resource.

**1.7.6** A predetermined, mutually agreed, and achievable "PMax-like" fixed MW value will be established for every Dynamic System Resource to be used as the basis for the UDP calculation. Responsible Scheduling Coordinators will be able to report de-rates affecting the Dynamic System Resource via the CAISO's SLIC Outage reporting system.

The North American Electric Reliability Corporation's (NERC) Qualified Path Unscheduled Flow Relief for the Western Electricity Coordinating Council (WECC), Reliability Standard WECC IRO-STD-006-0 filed by NERC in FERC Docket No. RR07-11-000 on March 26, 2007, and approved by FERC on June 8, 2007, and any amendments thereto, are hereby incorporated and made part of this CAISO Tariff. See

~~www.nerc.com for the current version of the NERC's Qualified Path Unscheduled Flow Relief Procedures for WECC.~~

1.7.7 Should there be any need or requirement, whether operational or procedural, for the CAISO to make Real-Time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules (to include curtailments), Dynamic Schedules shall be treated in the same manner as similarly situated and/or effective static CAISO Interchange Schedules.

## **2. DYNAMIC SCHEDULES OF EXPORTS OF ENERGY FROM GENERATING UNITS IN THE CAISO BALANCING AUTHORITY AREA**

### **2.1 CONSISTENCY WITH NERC/WECC POLICIES AND REQUIREMENTS**

2.1.1 Scheduling and operation of Dynamic Schedule functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling, in accordance with Section 4.5.4.3 of the CAISO Tariff.

### **2.2 CONTRACTUAL RELATIONSHIPS**

2.2.1 A Balancing Authority receiving a Dynamic Schedule of an export of Energy from a Generating Unit in the CAISO Balancing Authority Area must execute an operating agreement with the CAISO particular to the operation of the functionality supporting dynamic exports of Energy from the CAISO Balancing Authority Area.

2.2.2 The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must execute a Dynamic Scheduling Agreement for Scheduling Coordinators with the CAISO governing the operation of the Dynamic Schedule functionality, which agreement will include a provision for its termination based on failure to comply with these standards.

2.2.3 The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must have the necessary operational and contractual arrangements in place with the Balancing Authority receiving the export Dynamic Schedule to implement Section 2.3 and other provisions of this Appendix M. Such arrangements must include the Balancing Authority's ability to receive telemetry from the Generating Unit and to receive a Dynamic Schedule signal pertinent to that Generating Unit from the CAISO. Proof of such arrangements must be provided to the CAISO.

### **2.3 COMMUNICATIONS, TELEMETRY, AND OTHER TECHNICAL REQUIREMENTS**

2.3.1 The communication and telemetry requirements set forth in the applicable CAISO Business Practice Manual will apply to a Generating Unit that is the source of the Energy for a Dynamic Schedule of exports of Energy, in addition to the requirements set forth in this Appendix M applicable to Dynamic Schedules of exports of Energy.

2.3.2 A dedicated primary communications link and a backup communications link between the CAISO's EMS and the EMS of the Balancing Authority Area receiving the Dynamic Schedule are required.

- 2.3.3** The primary circuit will be T1-class, or equivalent, utilizing the inter-control center communications protocol ("ICCP"). The backup communications link will be diversely routed between the EMS of the Balancing Authority Area receiving the Dynamic Schedule and the CAISO Balancing Authority Area EMS on separate physical paths and devices, provided that the CAISO may approve an alternative means of providing backup communications if the circumstances warrant.
- 2.3.4** A primary dedicated communications link and a backup communications link between the EMS of the Balancing Authority Area receiving the Dynamic Schedule and any Intermediary Balancing Authority Area EMS are required, if requested by the Intermediary Balancing Authority Area.
- 2.3.5** The CAISO shall have a mechanism implemented to override the associated dynamic signal for a Dynamic Schedule of an export of Energy from a Generating Unit.
- 2.3.6** The dynamic signal must be properly incorporated into all involved Balancing Authority Areas' ACE equations.
- 2.3.7** The Generating Unit must have communications links with the Balancing Authority Area receiving a Dynamic Schedule consistent with this Appendix M.
- 2.3.8** The dynamic signal must be properly incorporated into the CAISO's market systems.

## **2.4** LIMITS ON DYNAMIC EXPORTS

- 2.4.1** The CAISO reserves the right to establish limits applicable to the amount of any Energy exported from the CAISO Balancing Authority Area, whether delivered dynamically or statically. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of, or a specific export limit applicable to, total CAISO Balancing Authority Area requirements; a percentage at, or a specific export limit applicable to, a particular Intertie or a Transmission Interface; a percentage of, or a specific export limit applicable to, total requirements in a specific Ancillary Service Region; or operating factors which may include, but are not limited to, operating Nomograms, Remedial Action Schemes, protection schemes, scheduling and curtailment procedures, or any potential single points of failure associated with the actual delivery process. The CAISO may implement a moratorium on the establishment of new Dynamic Schedules associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.
- 2.4.2** A Dynamic Schedule of an export of Energy from a Generating Unit in the CAISO Balancing Authority Area must be permanently associated with a particular CAISO Intertie (the CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Generating Unit with a particular CAISO Intertie).

## **2.5** OPERATING AND SCHEDULING REQUIREMENTS

- 2.5.1** All Dynamic Schedules associated with exports of Energy from a Generating Unit must be electronically tagged (by use of an E-Tag).

- 2.5.2** Formal inter-Balancing Authority Area Dynamic Schedules of the export of Energy from a Generating Unit may be issued only by the CAISO as the Host Balancing Authority Area and must be routed through the EMSs of any Intermediary Balancing Authority Area, if requested by the Intermediary Balancing Authority Area.
- 2.5.3** The CAISO will treat dynamically scheduled exports of Energy from a Generating Unit Energy as a resource contingent firm export. The Balancing Authority receiving the Dynamic Schedule of the export of Energy from the CAISO Balancing Authority Area is responsible for Operating Reserves for loads served by such exports of Energy as required by NERC and WECC reliability standards and any requirements of the NRC.
- 2.5.4** The dynamic signal must be integrated over time by the CAISO for every Operating Hour.
- 2.5.5** Notwithstanding any Dispatches of the Generating Unit in accordance with the CAISO Tariff, the CAISO shall have the right to issue operating orders as defined in Section 37.2.1.1 of the CAISO Tariff to the Generating Unit either directly or through the receiving Balancing Authority Area for emergency or contingency reasons, or to ensure the CAISO's compliance with operating requirements based on WECC or NERC requirements and policies (e.g., WECC's Unscheduled Flow Reduction Procedure). However, such operating orders may be issued only within the range of the CAISO-accepted Energy Bids for a given Operating Hour (or the applicable "sub-hour" interval).
- 2.5.6** If there is no Dynamic Schedule in the CAISO's Day-Ahead Market or HASP/RTM, the dynamic signal must be at "zero" ("0").
- 2.5.7** The Scheduling Coordinator for a Dynamic Schedule of an export of Energy from a Generating Unit must have the ability to override the associated Dynamic Schedule in order to respond to the operating orders of the CAISO or the Host Balancing Authority.
- 2.5.8** Unless the Dynamic Schedule of an export of Energy from a Generating Unit (1) is implemented as a directly-telemetered load following functionality, (2) is base-loaded Regulatory Must-Take Generation, (3) responds to an intra-hour dispatch instruction from the receiving Balancing Authority, or (4) is an Eligible Intermittent Resource, the Dynamic Schedule representing such resource must follow WECC-approved practice of 20-minute ramps centered at the top of the hour. The CAISO does not provide any special Settlements treatment nor offer any CAISO Tariff exemptions for dynamic load following functionalities.
- 2.5.9** In Real-Time the Dynamic Schedule may not exceed the CAISO's Dispatch Operating Point, which reflects the dynamic signal received by the CAISO from the Balancing Authority receiving the dynamically-scheduled Energy. The CAISO's Dispatch Operating Point represents not only the estimated Energy from the Generating Unit for export but also the transmission reservation on the associated CAISO Intertie.
- 2.5.10** Only one Dynamic Schedule may be associated with any one physical Generating Unit, unless the CAISO approves an implementation plan to establish multiple Dynamic Schedules for that Generating Unit.

**2.6** **COMPLIANCE, LOSSES, AND FINANCIAL SETTLEMENTS**

- 2.6.1** Energy delivered in association with a Dynamic Schedule of an export of Energy from a Generating Unit will be subject to all provisions of the CAISO's Imbalance Energy markets, including Uninstructed Deviation Penalties (UDP) (just as is the case with CAISO intra-Balancing Authority Area Generating Units of Participating Generators).
- 2.6.2** All Day-Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real-Time (with the exception of intra-hour Dispatch Instructions for Imbalance Energy issued by the CAISO and responses to the dynamic signal from the Balancing Authority receiving the Dynamic Schedule of the export of Energy).
- 2.6.3** All Dynamic Schedules and delivered Energy shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.
- 2.6.4** Any transmission losses attributed to the Dynamic Schedule on transmission system(s) external to the CAISO Balancing Authority Area will be the responsibility of the owner(s)/operator(s) of the Generating Unit associated with a Dynamic Schedule of an export of Energy.
- 2.6.5** Should there be any need or requirement, whether operational or procedural, for the CAISO to make Real-Time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules (to include curtailments), Dynamic Schedules shall be treated in the same manner as similarly situated and/or effective static CAISO Interchange Schedules.

\* \* \*

## **Appendix N ~~{Not Used}~~**

### **Pseudo-Tie Protocol**

- 1. Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area**
- 1.1 Consistency with NERC/WECC Requirements**
- 1.1.1** Operation of Pseudo-Tie functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling. A Pseudo-Tie must be registered as a "Point Of Delivery" (POD) on NERC's Transmission Service Information Network (TSIN). All (off-system) static scheduling associated with Pseudo-Tie functionality must be consistent with NERC Reliability Standards for interchange scheduling and coordination.
- 1.2 CAISO Operating, Technical, and Business Requirements**
- 1.2.1 Operating Requirements**
- 1.2.1.1** The CAISO shall establish and specify the location of any Pseudo-Tie between the CAISO Balancing Authority Area and the Native Balancing Authority Area. All Dynamic Schedules and delivered Energy from a Pseudo-Tie Generating Unit shall be subject to

the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.

- 1.2.1.2** A Pseudo-Tie Generating Unit must transfer dynamically its entire output of its Real-Time Generation production into the CAISO Balancing Authority Area at the associated pre-determined CAISO Intertie. A Pseudo-Tie Generating Unit must be permanently associated with a particular pre-determined CAISO Intertie. Any dynamic transfers of Energy, and/or Energy associated with Ancillary Services will be subject to Congestion mitigation at the associated pre-determined CAISO Intertie. The CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Pseudo-Tie Generating Unit with a particular CAISO Intertie. Any change to the designated path is subject to approval by all applicable transmission providers.
- 1.2.1.3** A Pseudo-Tie Generating Unit shall operate under the terms of the CAISO Tariff applicable to the Generating Units of Participating Generators in the CAISO Balancing Authority Area except as expressly provided, including requirements to promptly follow CAISO Dispatch Instructions, Exceptional Dispatch Instructions, operating orders as defined in Section 37.2.1.1 of the CAISO Tariff, and other instructions, without limitation, pursuant to Sections 7.6 and 7.7 of the CAISO Tariff and any CAISO Operating Procedure established specifically for the Pseudo-Tie, including in the event of an overload condition at the associated pre-determined CAISO Intertie.
- 1.2.1.4** A Participating Generator with a Pseudo-Tie Generating Unit shall demonstrate the ability to deliver the Pseudo-Tie Generating Unit's maximum output to the associated pre-determined CAISO Intertie by providing the CAISO with a copy of its interconnection agreement with the Balancing Authority for its Native Balancing Authority Area.
- 1.2.1.5** Firm transmission for the Operating Hour in a form agreed to by the CAISO must be reserved for the Pseudo-Tie Generating Unit output transfers into the CAISO Balancing Authority Area across the entire transmission path external to the CAISO Balancing Authority Area sufficient to permit delivery of an amount equal to at least the self-scheduled Generation of a Pseudo-Tie Generating Unit. In the event that a sufficient transmission reservation has not been established prior to the Operating Hour to support Dispatch up to the Pseudo-Tie Generating Unit's maximum available capacity, and additional transmission will not be available within the Operating Hour, a derate must be reported in the CAISO's Outage management system to limit its Dispatch to its available transmission.
- 1.2.1.6** All Energy transfers associated with a Pseudo-Tie Generating Unit must be electronically tagged (E-tagged).
- 1.2.1.7** The CAISO will treat all dynamically transferred Pseudo-Tie Generating Unit Energy as internal CAISO Balancing Authority Area Generation (except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie) and will procure, or ensure self-provision of, required Operating Reserves for the CAISO Balancing Authority Area Loads served by a Pseudo-Tie Generating Unit.
- 1.2.1.8** All dynamic Energy transfers associated with CAISO procurement of Spinning Reserve and Non-Spinning Reserve from a Pseudo-Tie Generating Unit will be afforded similar treatment (i.e., treatment as internal CAISO Balancing Authority Area Generation, except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie).
- 1.2.1.9** Off-system sales pursuant to a Pseudo-Tie Participating Generator Agreement shall only be delivered from the Pseudo-Tie Generating Unit. The maximum allowable off-system sales of Energy from a Pseudo-Tie Generating Unit may not exceed the Pseudo-Tie

Generating Unit's scheduled output for the respective hour. Off-system sales shall be treated as a firm fixed static export from the CAISO Balancing Authority Area.

**1.2.1.10** In Real-Time, the total output of a Pseudo-Tie Generating Unit shall be telemetered to the CAISO. If the Pseudo-Tie Generating Unit is an Eligible Intermittent Resource, telemetered data to the CAISO shall include appropriate operational data, meteorological data, and other data reasonably necessary to forecast Energy as specified in Appendix Q (Eligible Intermittent Resources Protocol) of the CAISO Tariff and applicable Business Practice Manuals.

**1.2.1.11** The Real-Time dynamic transfer from a Pseudo-Tie Generating Unit may not exceed the CAISO's Dispatch Operating Point. The Dispatch Operating Point represents not only the estimated Dynamic System Resource's Energy but also, in combination with any Ancillary Service Award that has not been dispatched as Energy, the transmission reservation on the associated CAISO Intertie. In the event that a Pseudo-Tie Generating Unit's output creates an imminent reliability issue on the associated pre-determined CAISO Intertie, the Pseudo-Tie Generating Unit will be subject to immediate curtailment by the CAISO. A Pseudo-Tie Generating Unit may also be curtailed whenever its Generation output, less any off-system sales, is greater than the associated transmission reservation pursuant to Section 1.2.1.5 of this Appendix N.

**1.2.1.12** The CAISO may, at its discretion, either limit or forego procuring any or all Ancillary Services at the particular pre-determined CAISO Intertie associated with a Pseudo-Tie Generating Unit to ensure that Operating Reserves are adequately dispersed throughout the CAISO Balancing Authority Area and its Interties as required by the WECC.

**1.2.1.13** Unless a particular service is procured by the Participating Generator from some other source, the CAISO shall provide to a Pseudo-Tie Generating Unit all Balancing Authority services available to other Generating Units in the CAISO Balancing Authority Area, which may include the auxiliary load equipment needs of the Pseudo-Tie Generating Unit, provided firm transmission service is reserved across the transmission path from the CAISO Intertie to the Pseudo-Tie Generating Unit.

**1.2.1.14** The CAISO and the Native Balancing Authority Area will develop a coordinated operating procedure to facilitate the continued delivery of Energy and Ancillary Services from a Pseudo-Tie Generating Unit to the desired delivery points in the event the primary contract path is unavailable or curtailed.

**1.2.1.15** The CAISO may implement a moratorium on the establishment of new Pseudo-Ties associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.

## **1.2.2** Technical Requirements

**1.2.2.1** All applicable communication and telemetry requirements of the WECC, the CAISO, and a Pseudo-Tie Generating Unit's Native Balancing Authority Area regarding generating units and inter-Balancing Authority Area Interties must be satisfied. These requirements include the requirements of Appendix M applicable to Dynamic Schedules of imports and the requirements of the CAISO Tariff applicable to Generating Units in the CAISO Balancing Authority Area.

**1.2.2.2** Proper incorporation of the dynamic signal into all involved Balancing Authority Areas' ACE equations will be required.

**1.2.2.3** If there is no Scheduled Generation in the DAM, HASP, or Real-Time markets, a Pseudo-Tie Generating Unit shall not generate except when issued an Exceptional Dispatch or operating order as defined in Section 37.2.1.1 of the CAISO Tariff from the CAISO.

**1.2.2.4** If a Participating Generator with a Pseudo-Tie Generating Unit desires to participate in the CAISO's Regulation market, all provisions of the CAISO's Standards for Imports of Regulation, or any successor CAISO standards regarding the technical arrangements for imports of Regulation posted on the CAISO Website, shall apply.

**1.2.2.5** Only one dynamic transfer signal may be associated with any Pseudo-Tie Generating Unit.

### **1.2.3 Business Requirements**

**1.2.3.1** For Settlements, the Energy transferred dynamically from a Pseudo-Tie Generating Unit during an Operating Hour will be settled based on the Generating Unit revenue meter value, and any static off-system sales represented as an export quantity will be deemed delivered at a Pseudo-Tie for that Operating Hour consistent with Section 1.2.1.9 of this Appendix N.

**1.2.3.2** Any transmission losses and other transmission related costs attributable to a Pseudo-Tie Generating Unit on a non-CAISO transmission system will remain the responsibility of the Participating Generator.

**1.2.3.3** Should there be any need or requirement, whether operational or procedural, for the CAISO to make real time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules at the pre-determined CAISO Intertie associated with a Pseudo-Tie Generating Unit (including curtailments), the dynamic transfer from the Pseudo-Tie Generating Unit shall be treated in the same manner as any CAISO Interchange Schedule at that pre-determined CAISO Intertie.

**1.2.3.4** A Pseudo-Tie Generating Unit will be eligible to set the Market Clearing Price in accordance with the CAISO Tariff in all applicable CAISO Markets.

**1.2.3.5** The CAISO shall assess charges to the Scheduling Coordinator for a Participating Generator with a Pseudo-Tie Generating Unit on the same basis as they apply to any other CAISO intra-Balancing Authority Area Generating Unit, subject to the provisions of this Section 1.2.3.5.

**1.2.3.5.1** Any transfers from a Pseudo-Tie Generating Unit scheduled into the CAISO Balancing Authority Area shall be subject to CAISO charges associated with the DAM and Real-Time Market, except that (1) Energy associated with the Pseudo-Tie Generating Unit will be subject to Intertie Congestion charges that are incorporated into the LMP, (2) Ancillary Services provided by the Pseudo-Tie Generating Unit will be assessed applicable Intertie Congestion charges pursuant to Section 11.10.1 of the CAISO Tariff, and (3) the transfers will be subject to any applicable transmission loss obligation charges in cases where the CAISO and another Balancing Authority have agreed on an assessment to the CAISO of supplemental losses incurred outside of the CAISO Balancing Authority Area.

**1.2.3.5.2** Any off-system sales of Energy shall be subject to all export charges except the Wheeling Access Charge. A special export market Resource ID is required for this purpose for which the Participating Generator shall provide ninety (90) days advance notice prior to implementation.

### **1.3 Operating Agreements**



**1.3.1** A Pseudo-Tie of a Generating Unit to the CAISO Balancing Authority Area shall be conditional on the facilitation by the Native Balancing Authority Area of the Pseudo-Tie functionality in accordance with an operating agreement between the Balancing Authority for the Native Balancing Authority Area and the CAISO specific to Pseudo-Tie functionality. The CAISO will request that any such operating agreement limit the ability of the Balancing Authority for the Native Balancing Authority Area to terminate the operating agreement or otherwise withdraw from the Pseudo-Tie functionality established pursuant to the operating agreement.

**1.3.2** A Participating Generator with a Pseudo-Tie Generating Unit shall comply with its contractual obligations to the owners of the facilities to which the Pseudo-Tie Generating Unit is interconnected and/or the Native Balancing Authority Area that affect in any way the ability of the Participating Generator to perform its obligations under its Pseudo-Tie Participating Generator Agreement.

## **2. Pseudo-Ties of Generating Units out of the CAISO Balancing Authority Area**

### **2.1 Consistency with NERC/WECC Requirements**

**2.1.1** Operation of Pseudo-Tie functionalities must comply with all applicable NERC and WECC reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling. A Pseudo-Tie must be registered as a "Point Of Delivery" (POD) on NERC's Transmission Service Information Network (TSIN). All interchange scheduling associated with Pseudo-Tie functionality must be consistent with NERC Reliability Standards for interchange scheduling and coordination.

### **2.2 Operating, Technical, and Business Requirements**

#### **2.2.1 Operating Requirements**

**2.2.1.1** The CAISO and the Balancing Authority for the Attaining Balancing Authority Area will establish the terms of any Pseudo-Tie between the CAISO Balancing Authority Area and the Attaining Balancing Authority Area for a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area, will specify the location of that Pseudo-Tie point, and will register that location as a point of delivery to the Attaining Balancing Authority Area.

**2.2.1.2** The owner of a generating unit that will be a Pseudo-Tie out of the CAISO Balancing Authority Area must (a) transfer dynamically its entire output of its real time generation production and (b) submit Bids, including Self-Schedules, into the CAISO Markets to schedule the use of CAISO transmission associated with the export of the Pseudo-Tie generating unit Energy into the Attaining Balancing Authority Area at the associated pre-existing CAISO physical Intertie, as provided in Section 2.2.2.3 of this Appendix N.

**2.2.1.3** There will be no static imports from a Pseudo-Tie generating unit directly into the CAISO Balancing Authority Area.

**2.2.1.4** All Energy transfers associated with a Pseudo-Tie generating unit must be electronically tagged (e-tagged).

**2.2.1.5** The CAISO will treat all dynamically transferred Energy from a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area as generation external to the CAISO Balancing Authority Area.

**2.2.1.6** In case a generating unit that is a Pseudo-Tie out of the CAISO Balancing Authority Area is curtailed or forced out of service in real-time, the associated Pseudo-Tie Bids

submitted into the CAISO Markets must be adjusted by the next available CAISO Market scheduling timeframe.

**2.2.1.7** In real-time, the total output of a Pseudo-Tie generating unit shall be telemetered to the CAISO and to the Balancing Authority for the Attaining Balancing Authority Area.

**2.2.1.8** In real-time, the total Energy from a Pseudo-Tie generating unit shall not exceed the capacity of the Pseudo-Tie generating unit as specified in the agreement between the CAISO and the owner of the Pseudo-Tie generating unit.

**2.2.1.9** The CAISO, the Balancing Authority for the Attaining Balancing Authority Area, any affected Participating Transmission Owner, and the owner of the Pseudo-Tie generating unit will develop a coordinated operating procedure outlining the agreed upon framework among all parties for the operation of a Pseudo-Tie of the generating unit out of the CAISO Balancing Authority Area.

**2.2.1.10** The output of a Pseudo-Tie generating unit may be subject to real-time curtailments and operating orders as defined in Section 37.2.1.1 of the CAISO Tariff as directed by the CAISO in accordance with Good Utility Practices.

**2.2.1.11** The CAISO may implement a moratorium on the establishment of new Pseudo-Ties associated with a particular Intertie in the event it determines that the volume of dynamic transfers could have an adverse effect on System Reliability. In the event the CAISO implements such a moratorium, the CAISO shall undertake studies to determine an appropriate allocation of the capacity of the affected Intertie to dynamic transfers.

## **2.2.2** Technical Requirements

**2.2.2.1** All applicable communication and telemetry requirements of the WECC, the CAISO, and the Balancing Authority for the Attaining Balancing Authority Area regarding generating units and inter-Balancing Authority Area interties must be satisfied, provided that the CAISO's communications and telemetry requirements for Generating Units in the CAISO Balancing Authority Area shall not be applicable, except that the owner of a generating unit that is a Pseudo-Tie out of the CAISO Balancing Authority Area shall provide meteorological data and forecast information from any wind or solar resource in accordance with the requirements for Eligible Intermittent Resources in Appendix Q (Eligible Intermittent Resources Protocol) of the CAISO Tariff and applicable Business Practice Manuals.

**2.2.2.2** Proper incorporation of the dynamic signal into all involved Balancing Authority Areas' ACE equations will be required.

**2.2.2.3** A Pseudo-Tie generating unit must be permanently associated with a particular pre-existing CAISO Intertie. If for any reason delivery cannot be made to the associated pre-existing CAISO Intertie, the CAISO may still treat the Energy from a Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area as deemed delivered to the owner of the Pseudo-Tie generating unit at an alternate designated Intertie with available capacity. The Balancing Authority for the Attaining Balancing Authority Area will immediately request emergency wheeling service from the CAISO under provisions of the inter-Balancing Authority agreement between the CAISO and that Balancing Authority to maintain the Pseudo-Tie generating unit schedule via the alternate designated Intertie. The owner of the Pseudo-Tie generating unit, or its designated Scheduling Coordinator, will reschedule the Pseudo-Tie generating unit Energy in the next available CAISO scheduling timeframe through the CAISO scheduling system, until the transmission path to the associated pre-existing CAISO Intertie is re-established. The owner of the

Pseudo-Tie generating unit, or its designated Scheduling Coordinator, will be charged and will pay for the requested emergency use transmission and all associated CAISO charges, in accordance with the CAISO Tariff, for this emergency service.

**2.2.2.4** Only one dynamic transfer signal may be associated with a Pseudo-Tie generating unit.

**2.2.2.5** Should there be any need or requirement, whether operational or procedural, for the CAISO or the Balancing Authority for the Attaining Balancing Authority Area to make real-time adjustments to the CAISO's inter-Balancing Authority Area schedules at the pre-existing CAISO Intertie associated with the Pseudo-Tie generating unit (including curtailments), the dynamic transfer from the Pseudo-Tie generating unit shall be treated in the same manner as any CAISO Interchange Schedule at that pre-existing CAISO Intertie, and in accordance with any applicable operating instructions from any affected Participating Transmission Owner.

**2.2.2.6** Energy delivered from the Pseudo-Tie generating unit will be subject to all provisions of the Balancing Authority Area procedures of the Balancing Authority for the Attaining Balancing Authority Area.

### **2.2.3 Business Requirements**

**2.2.3.1** For settlements, the Energy transferred dynamically from the Pseudo-Tie generating unit during an operating hour will be deemed delivered, for that operating hour.

**2.2.3.2** All Energy from a Pseudo-Tie generating unit interchange shall be subject to the CAISO Tariff Transmission Loss construct and billed accordingly to the owner of the Pseudo-Tie generating unit or the designated Scheduling Coordinator for the Pseudo-Tie generating unit, including any applicable transmission loss obligation charges in cases where the CAISO and another Balancing Authority have agreed on an assessment to the CAISO of supplemental losses incurred for the Energy outside of the CAISO Balancing Authority Area.

**2.2.3.3** The ISO shall assess the owner of a Pseudo-Tie generating unit or its designated Scheduling Coordinator all applicable market charges and Grid Management Charges in accordance with the CAISO Tariff.

**2.2.3.4** In the event of a line outage and a subsequent request by the Balancing Authority for the Attaining Balancing Authority Area for emergency Wheeling service from the CAISO to maintain deliveries of power to the Attaining Balancing Authority Area from the Pseudo-Tie generating unit, all CAISO Tariff market and GMC charges applicable to the resulting use of CAISO transmission service shall be applied for the duration of these events, inclusive of any related HASP Schedules.

**2.2.3.5** All Pseudo-Tie generating unit export schedules from the Attaining Balancing Authority Area shall be submitted by a certified Scheduling Coordinator into the CAISO Markets as coordinated import and export Wheeling Through Bids, at the designated pre-existing Intertie with the Attaining Balancing Authority Area associated with the Pseudo-Tie.

### **2.3 Operating Agreements**

**2.3.1** A Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area shall be conditional on the facilitation by the Balancing Authority for the Attaining Balancing Authority Area of the Pseudo-Tie functionality in accordance with an operating agreement to be entered into between the Balancing Authority for the Attaining Balancing Authority Area and the CAISO specific to Pseudo-Tie functionality.

**2.3.2** The owner of a Pseudo-Tie generating unit shall comply with its contractual obligations with the owners of the facilities to which the Pseudo-Tie generating unit is interconnected and/or the Attaining Balancing Authority Area that affect in any way the ability of the owner of the Pseudo-Tie generating unit to perform its obligations under the CAISO Tariff and an agreement to be entered into between the owner of the Pseudo-Tie generating unit and the CAISO.

\* \* \*

## Appendix Q Eligible

### Intermittent Resources Protocol (EIRP)

\* \* \*

#### 2.2.1 Agreements

The following agreements must be executed by the owner or operator of any Eligible Intermittent Resource, unless that resource is not subject to any of these agreements pursuant to the CAISO Tariff, such as an Eligible Intermittent Resource of an MSS Operator:

- (a) A Participating Generator Agreement, ~~or~~ QF PGA, Dynamic Scheduling Agreement for Scheduling Coordinators, or Pseudo-Tie Participating Generator Agreement that, among other things, binds the Eligible Intermittent Resource to comply with the CAISO Tariff; and
- (b) A Meter Service Agreement for CAISO Metered Entities, for all Eligible Intermittent Resources other than Dynamic System Resources.

If an Eligible Intermittent Resource intends to become a Participating Intermittent Resource, it must also execute a letter of intent, which when executed and delivered to the CAISO shall initiate the process of certifying the Participating Intermittent Resource. The form of the letter of intent shall be specified by the CAISO in a Business Practice Manual.

#### 2.2.2 Composition of a Participating Intermittent Resource

The CAISO shall develop criteria to determine whether one or more Eligible Intermittent Resources may be included within a Participating Intermittent Resource. Such criteria shall include:

- (a) A Participating Intermittent Resource must be at least one (1) MW rated capacity.
- (b) A Participating Intermittent Resource may include one (1) or more Eligible Intermittent Resources that have similar response to weather conditions or other variables relevant to forecasting Energy, as determined by the CAISO.
- (c) Each Participating Intermittent Resource shall be electrically connected at a single point on the CAISO Controlled Grid, except as otherwise permitted by the CAISO on a case-by-case basis as may be allowed under the CAISO Tariff. Interconnection to a portion of the CAISO Controlled Grid outside or not contiguous to the CAISO Balancing Authority Area does not make an Eligible Intermittent Resource that is a Dynamic System

Resource or Pseudo-Tie Generating Unit eligible to be included within a Participating Intermittent Resource.

- (d) The same Scheduling Coordinator must schedule all Eligible Intermittent Resources aggregated into a single Participating Intermittent Resource.

\* \* \*

## Appendix X

### [Not Used]

#### Dynamic Scheduling Protocol (DSP)

~~1 [NOT USED]~~

~~2 CONSISTENCY WITH NERC/WECC POLICIES AND REQUIREMENTS~~

~~2.1 Scheduling and operation of Dynamic Schedule functionalities must comply with all applicable NERC and WECC policies and requirements regarding inter-Balancing Authority Area scheduling, in accordance with Section 4.5.4.3 of the CAISO Tariff.~~

~~2.2 Scheduling and operation of Dynamic Schedule functionalities must be consistent with the NERC Dynamic Transfer White Paper and all NERC standards or policies.~~

~~2.3 All new dynamic functionality implementations may be subject to NERC-specified peer review.~~

~~3 CONTRACTUAL RELATIONSHIPS~~

~~3.1 The Host Balancing Authority and all Intermediary Balancing Authorities must each execute an Interconnected Balancing Authority Area Operating Agreement (“IBAAOA”) with the CAISO, with accompanying service schedule, a Dynamic Scheduling Host Balancing Authority Operating Agreement, or a special agreement particular to the operation of the functionality supporting dynamic imports of Energy, and/or Energy associated with non-Regulation Ancillary Services to the CAISO Balancing Authority Area.~~

~~3.2 The Scheduling Coordinator for the System Resource must execute a Dynamic Scheduling Agreement for Scheduling Coordinators with the CAISO governing the operation of the Dynamic Schedule functionality, which agreement will include a provision for its termination based on failure to comply with these standards.~~

~~3.3 The Scheduling Coordinator for the System Resource must have the necessary operational and contractual arrangements in place with the Host Balancing Authority (see Section 5 of this Appendix X below). Such arrangements must include the Host Balancing Authority's ability to receive telemetry from the System Resource and to issue a Dynamic Schedule signal pertinent to that System Resource to the CAISO. Proof of such arrangements must be provided to the CAISO.~~

~~4 COMMUNICATIONS, TELEMETRY, AND OTHER TECHNICAL REQUIREMENTS~~

- 4.1 ~~The communication and telemetry requirements set forth in the CAISO's Standards for Imports of Regulation will apply to all Dynamic Schedules, except for (a) those dynamic functionalities established prior to the CAISO Operations Date, (b) the requirements that are specific solely to Regulation, and (c) the requirements set forth below.~~
- 4.2 ~~Dedicated dual redundant communications links between the CAISO's EMS and the Host Balancing Authority Area EMS are required.~~
- 4.3 ~~The primary circuit will be T1-class, or equivalent, utilizing the inter-control center communications protocol ("ICCP"). The backup circuit will be diversely routed between the Host Balancing Authority Area EMS and the CAISO Balancing Authority Area EMS on separate physical paths and devices.~~
- 4.4 ~~Dedicated dual redundant communications links between the Host Balancing Authority Area EMS and every Intermediary Balancing Authority Area EMS are required.~~
- 4.5 ~~The Balancing Authority Area hosting a Dynamic System Resource must have a mechanism implemented to override the associated dynamic signal.~~
- 4.6 ~~The dynamic signal must be properly incorporated into all involved Balancing Authority Areas' ACE equations.~~
- 4.7 ~~The System Resource must have communications links with the Host Balancing Authority Area consistent with this Appendix X.~~

## **5 ~~LIMITS ON DYNAMIC IMPORTS~~**

- 5.1 ~~The CAISO reserves the right to establish limits applicable to the amount of any Ancillary Services and/or Energy imported into the CAISO Balancing Authority Area, whether delivered dynamically or statically. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of, or a specific import limit applicable to, total CAISO Balancing Authority Area requirements; a percentage at, or a specific import limit applicable to, a particular Scheduling Point or a Transmission Interface; a percentage of, or a specific import limit applicable to, total requirements in a specific Ancillary Service Region; or operating factors which may include, but are not limited to, operating Nomograms, Remedial Action Schemes, protection schemes, scheduling and curtailment procedures, or any potential single points of failure associated with the actual delivery process.~~
- 5.2 ~~The CAISO may, at its discretion, either limit or forego procuring Ancillary Services at particular Balancing Authority Area Scheduling Points to ensure that Operating Reserves are adequately dispersed throughout the CAISO Balancing Authority Area as required by NERC and WECC reliability standards, including any requirements of the NRC.~~
- 5.3 ~~A Dynamic System Resource and its Dynamic Schedules must be permanently associated with a particular CAISO Scheduling Point (the CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Dynamic System Resource with a particular CAISO Scheduling Point).~~

## **6 ~~OPERATING AND SCHEDULING REQUIREMENTS~~**

- ~~6.1 For any Operating Hour for which Energy and/or Ancillary Services (and associated Energy) is scheduled dynamically to the CAISO from the System Resource, a firm (or non-interruptible for that hour) matching transmission service must be reserved across the entire Dynamic Schedule transmission path external to the CAISO Balancing Authority Area.~~
- ~~6.2 All Dynamic Schedules associated with newly implemented Dynamic System Resources must be electronically tagged (by use of an E-Tag).~~
- ~~6.3 Formal inter-Balancing Authority Area Dynamic Schedules may be issued only by the Dynamic System Resource's Host Balancing Authority Area and must be routed through the EMSs of all Intermediary Balancing Authority Areas (such schedules would be considered "wheel-through" schedules by Intermediary Balancing Authority Areas).~~
- ~~6.4 The CAISO will treat dynamically scheduled Energy as a resource-contingent firm import. The CAISO will procure (or allow for self-provision of) Operating Reserves for Loads served by Dynamic System Resources as required by NERC and WECC reliability standards, including any requirements of the NRC.~~
- ~~6.5 All Energy Interchange Schedules associated with dynamically scheduled imports of Spinning Reserve and Non-Spinning Reserve will be afforded similar treatment (i.e., resource-contingent firm).~~
- ~~6.6 The dynamic signal must be integrated over time by the Host Balancing Authority Area for every Operating Hour.~~
- ~~6.7 Notwithstanding any Dispatches of the System Resource in accordance with the CAISO Tariff, the CAISO shall have the right to issue operating orders to the System Resource either directly or through the Host Balancing Authority Area for emergency or contingency reasons, or to ensure the CAISO's compliance with operating requirements based on WECC or NERC requirements and policies (e.g., WECC's Unscheduled Flow Reduction Procedure). However, such operating orders may be issued only within the range of the CAISO-accepted Energy and Ancillary Services, Bids for a given Operating Hour (or the applicable "sub-hour" interval).~~
- ~~6.8 If there is no Dynamic Schedule in the CAISO's Day-Ahead Market, or HASP/RTM the dynamic signal must be at "zero" ("0") except when in response to CAISO's Dispatch Instructions associated with accepted Ancillary Services Bids.~~
- ~~6.9 The Scheduling Coordinator of the Dynamic System Resource must have the ability to override the associated Dynamic Schedule in order to respond to the operating orders of the CAISO or the Host Balancing Authority.~~
- ~~6.10 Unless the Dynamic System Resource (1) is implemented as a directly-telemetered Load following functionality, (2) is base-loaded Regulatory Must-Take Generation, or (3) responds to a CAISO intra-hour Dispatch Instruction, the Dynamic Schedule representing such resource must follow WECC-approved practice of 20-minute ramps centered at the top of the hour. The CAISO does not provide any special Settlements treatment nor offer any CAISO Tariff exemptions for dynamic Load following functionalities.~~

~~6.11~~ In Real-Time the Dynamic Schedule may not exceed the maximum value established by the sum of the Day-Ahead Market and HASP/RTM-accepted Energy and Ancillary Services Bids plus any response to the CAISO's Real-Time Dispatch Instructions. The composite value of the Dynamic Schedule derived from the Day-Ahead and HASP/RTM-accepted Bids plus any Dispatch Instruction response represents not only the estimated Dynamic System Resource's Energy but also the transmission reservation on the associated CAISO Scheduling Point.

~~6.12~~ Only one Dynamic System Resource may be associated with any one physical generating resource.

~~6.13~~ If the Scheduling Coordinator for the Dynamic System Resource desires to participate in CAISO's Regulation market, all provisions of the CAISO's Standards for Imports of Regulation shall apply.

## ~~7~~ **CERTIFICATION, TESTING, AND PERFORMANCE MONITORING OF DYNAMIC IMPORTS OF ANCILLARY SERVICES**

~~Scheduling Coordinators and Host Balancing Authorities that are already certified under the CAISO's Standards for Imports of Regulation will be deemed to have fulfilled the technical implementation requirements of this Appendix X; however, such Scheduling Coordinators and Balancing Authorities must still be certified separately for each non-Regulation Ancillary Service (all presently implemented Regulation import functionalities may be subject to review to ensure consistency between such functionalities and the requirements of this Appendix X). Scheduling Coordinators and Host Balancing Authorities that wish to be certified for imports of Regulation shall be subject to certification under the Standards for Imports of Regulation, subject to verification of consistency with the requirements of this Appendix X.~~

~~7.1~~ The Scheduling Coordinator and Host Balancing Authority must jointly request the certification of a System Resource to provide Ancillary Services for the CAISO Balancing Authority Area and cooperate in the testing of such System Resource (see the certification request form attached as Attachment A to this Appendix X).

~~7.2~~ Only CAISO tested and certified System Resources will be allowed to bid and/or self-provide Ancillary Services into the CAISO Balancing Authority Area.

~~7.3~~ Dynamic Ancillary Services imports will be certified through testing, in accordance with the relevant sections of the CAISO's Operating Procedure G-213. All requests for certification of dynamic Ancillary Services imports will be reviewed and approved by the CAISO with respect to any technical limitations imposed by existing operational considerations, such as Remedial Action Schemes, operating Nomograms, and scheduling procedures. These reviews may impose certain Ancillary Services import limits in addition to those outlined in Section 4.1 of this Appendix X. Therefore, interested parties are advised and encouraged to contact the CAISO before they begin the process of the necessary systems design, preparation, and implementation for import of Ancillary Services to the CAISO Balancing Authority Area.



~~7.4 The CAISO will measure the performance of the Dynamic Schedule of Energy associated with an accepted Ancillary Services Bid against (1) the awarded range of Ancillary Service capacity; (2) the certified limits; and (3) the bid Ramp Rate, which shall be validated by the CAISO against the certified Ramp Rate.~~

~~7.5 The Scheduling Coordinator for the System Resource and the Host Balancing Authority must notify the CAISO should any changes, modifications, or upgrades affecting control and/or performance of the System Resource be made. Upon such notification, the CAISO, at its discretion, may require that the System Resource and Host Balancing Authority be re-certified to import Ancillary Services into the CAISO Balancing Authority Area.~~

## ~~8 COMPLIANCE, LOSSES, AND FINANCIAL SETTLEMENTS~~

~~8.1 Energy delivered in association with Dynamic System Resources will be subject to all provisions of the CAISO's Imbalance Energy markets, including Uninstructed Deviation Penalties (UDP) (just as is the case with CAISO intra-Balancing Authority Area Generating Units of Participating Generators).~~

~~8.2 Dynamically scheduled and delivered Ancillary Services will be subject to the CAISO's compliance monitoring and remedies, just as any CAISO intra-Balancing Authority Area Generating Units of Participating Generators.~~

~~8.3 All Day Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real Time (with the exception of intra-hour Dispatch Instructions of the Energy associated with accepted Ancillary Services Bids).~~

~~8.4 All Dynamic Schedules and delivered Energy shall be subject to the standard CAISO Transmission Loss calculation associated with the particular Scheduling Point.~~

~~8.5 Any transmission losses attributed to the Dynamic Schedule on transmission system(s) external to the CAISO Balancing Authority Area will be the responsibility of the owner(s)/operator(s) of the Dynamic System Resource.~~

~~8.6 A predetermined, mutually agreed, and achievable "PMax-like" fixed MW value will be established for every Dynamic System Resource to be used as the basis for the UDP calculation. Responsible Scheduling Coordinators will be able to report de-rates affecting the Dynamic System Resource via the CAISO's SLIC Outage reporting system.~~

~~8.7 Should there be any need or requirement, whether operational or procedural, for the CAISO to make Real Time adjustments to the CAISO's inter-Balancing Authority Area Interchange Schedules (to include curtailments), Dynamic Schedules shall be treated in the same manner as similarly situated and/or effective static CAISO Interchange Schedules.~~

**DSP ATTACHMENT A**

**Scheduling Coordinator & Host Balancing Authority**

**Request for Certification of**

**Imports of Spinning and Non-Spinning Reserves for which the associated Energy is delivered dynamically from a System Resource**

In accordance with the CAISO Tariff, CAISO Protocols, and the CAISO's Business Practice Manuals and Operating Procedures, \_\_\_\_\_, as Scheduling Coordinator, and \_\_\_\_\_, as Host Balancing Authority (as such term is referred to in the CAISO Dynamic Scheduling Protocol), collectively referred to as "Parties," or individually as "Party," hereby request the certification of the Parties and the System Resource(s) identified in the table below as a provider of Ancillary Services and associated Energy to the CAISO Balancing Authority Area subject to the Dynamic Scheduling Protocol, Appendix X of the CAISO Tariff. Further, the Parties acknowledge that their ability to import Ancillary Services and associated Energy will be tested for certification in accordance with CAISO Operating Procedure G-213.

With this request for certification, the Parties recognize that the CAISO Tariff, CAISO Protocols, and applicable agreements require the Host Balancing Authority to issue Dynamic Schedules of Energy to the CAISO based on the Scheduling Coordinator's self-provided or bid external imports of non-Regulation Ancillary Services from the System Resource(s) at any time during the Operating Hour.

With this request for certification, the Host Balancing Authority represents and warrants that it has in place the required communications links with the CAISO Balancing Authority Area in order to facilitate the delivery of Ancillary Services and associated Energy from the System Resource.

With this request for certification, the Scheduling Coordinator represents and warrants that it has made the appropriate arrangements for and has put in place the equipment and services necessary for the delivery of Ancillary Services and associated Energy from the System Resource to the point of Interchange ("Scheduling Point") with the CAISO Balancing Authority Area in accordance with the Dynamic Scheduling Protocol.

The Scheduling Coordinator further certifies that any and all dynamic imports of Energy associated with self-provided or bid imports of non-Regulation Ancillary Services will be deliverable over non-interruptible, non-recallable transmission rights, from the source of the associated Energy to the Scheduling Point with the CAISO Balancing Authority Area.

System Resource External Host Balancing Authority Area in which System Resource is Located Scheduling Point

(CAISO Interchange ID) Maximum Amount of Ancillary Services Capacity to be Certified

(MW)Maximum Ramp Rate to be Certified

(MW/minute)12345

Subsequent to the initial filing of this request for certification with the CAISO, any prospective changes jointly made by the Parties may be filed with the Scheduling Coordinator's CAISO customer service representative, who will acknowledge the receipt of such requested changes and indicate the date on which such changes may be tested and become effective if CAISO testing proves successful. Such changes will be made by the CAISO as soon as practicable, with reasonable efforts made to implement them within sixty (60) days of receipt of the requested changes.

This document \_\_\_\_\_ (does) \_\_\_\_\_ (does not) contain requested changes to previously effective certification.

Certification Requested By:

\_\_\_\_\_, as the Scheduling Coordinator

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_, as the Host Balancing Authority

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

CERTIFICATION REQUEST ACKNOWLEDGED by:

\_\_\_\_\_

**California Independent System Operator Corporation**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\* \* \*

**Attachment C**

**Table Listing New and Modified ISO Tariff Provisions and  
Corresponding Sections of Transmittal Letter that  
Explain the Reasons for the Tariff Changes**

**Dynamic Transfer Tariff Amendment  
July 29, 2011**

<b>New or Modified ISO Tariff Provision</b>	<b>Section(s) of Transmission Letter</b>
4.5.1.1.6.2	II.C.2
4.5.4.3.1	II.B.1, II.B.2, II.B.5, II.E
4.5.4.3.2	II.B.1
4.6	II.C.2
4.6.1.1	II.C.2
4.15	II.C.2
4.16	II.C.2
6.5.5.1.1	II.C.2
7.2	II.E
8.1	II.C.2, II.E
8.2.3.3	II.C.2, II.E
8.3.1	II.C.2, II.E
8.3.2	II.B.5, II.C.2, II.E
8.3.4	II.B.5
8.3.7	II.C.2
8.3.7.1	II.E
8.3.7.2	II.B.2, II.E
9.3.6	II.C.2
11.10.1.1.1	II.D.1
11.10.1.2.1	II.D.1
11.10.1.3.1	II.D.1
11.10.9.1	II.D.1
16.5.1	II.C.2
17.2.1	II.C.2
27.5.1.1	II.D.1, II.E
30.7.6.2	II.C.2, II.E
33.6	II.C.2
34.11.2	II.D.2
40.8.1.6	II.D.2
40.8.1.12.1	II.D.2
40.9.4.2.1	II.C.2
43.5.2	II.C.2
Appendix A – master definition supplement	II.B.4, II.B.5, II.C.1, II.D.2, II.E
Appendix A, definition of attaining balancing authority area	II.C.1
Appendix A, definition of dynamic scheduling host balancing authority operating	II.B.4, II.B.5
Appendix A, definition of eligible intermittent resource	II.D.2
Appendix A, definition of generating unit	II.C.1, II.E

<b>New or Modified ISO Tariff Provision</b>	<b>Section(s) of Transmission Letter</b>
Appendix A, definition of interruptible imports	II.E
Appendix A, definition of native balancing authority area	II.C.1
Appendix A, definition of node	II.C.1
Appendix A, definition of participating generator	II.C.1
Appendix A, definition of pseudo-tie	II.C.1
Appendix A, definition of pseudo-tie participating generator agreement	II.C.1
Appendix A, definition of wheeling out	II.C.1
Appendix B.5 – <i>pro forma</i> dynamic scheduling agreement for scheduling coordinators	II.B.3, II.B.5
Appendix B.5, Section 3.2.2	II.B.3, II.B.5
Appendix B.5, Section 4.1.2	II.B.3
Appendix B.5, Section 4.1.4	II.B.3
Appendix B.5, Section 4.1.5	II.B.3
Appendix B.5, Section 4.1.6	II.B.3
Appendix B.5, Section 4.2	II.B.3
Appendix B.5, Section 5.1	II.B.3
Appendix B.5, Section 6.1	II.B.3
Appendix B.5, Schedule 1	II.B.3
Appendix B.9 – <i>pro forma</i> dynamic scheduling host balancing authority operating agreement	II.B.2, II.B.4, II.B.5
Appendix B.9, Section 2.2.1	II.B.4, II.B.5
Appendix B.9, Section 3.1	II.B.4
Appendix B.9, Section 3.2	II.B.4
Appendix B.9, Section 6.4	II.B.4
Appendix B.16 – <i>pro forma</i> pseudo-tie participating generator agreement	II.C.3
Appendix B.16, Article I	II.C.3
Appendix B.16, Article II	II.C.3
Appendix B.16, Article III	II.C.3
Appendix B.16, Article IV	II.C.3
Appendix B.16, Article V	II.C.3
Appendix B.16, Article VI	II.C.3
Appendix B.16, Article VII	II.C.3
Appendix B.16, Article VIII	II.C.3
Appendix B.16, Article IX	II.C.3
Appendix B.16, Article X	II.C.3
Appendix B.16, Article XI	II.C.3

<b>New or Modified ISO Tariff Provision</b>	<b>Section(s) of Transmission Letter</b>
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Appendix B.16, Schedule 2	II.C.3
Appendix I – station power protocol	II.C.2
Appendix I, Section 2.2.1	II.C.2
Appendix M – dynamic scheduling protocol	II.B.2, II.B.5, II.D.3, II.E
Appendix M, Section 1	II.B.5
Appendix M, Section 1.1	II.B.5
Appendix M, Section 1.2	II.B.5
Appendix M, Section 1.2.1	II.B.5
Appendix M, Section 1.3	II.B.5
Appendix M, Section 1.3.1	II.E
Appendix M, Section 1.3.2	II.B.5
Appendix M, Section 1.3.3	II.B.5
Appendix M, Section 1.3.4	II.B.5
Appendix M, Section 1.4	II.B.5
Appendix M, Section 1.4.1	II.B.5, II.D.3
Appendix M, Section 1.4.2	II.E
Appendix M, Section 1.5	II.B.5
Appendix M, Section 1.5.1	II.B.5
Appendix M, Section 1.5.2	II.B.5
Appendix M, Section 1.5.3	II.B.5
Appendix M, Section 1.5.4	II.E
Appendix M, Section 1.5.7	II.E
Appendix M, Section 1.5.8	II.B.5
Appendix M, Section 1.5.9	II.B.5
Appendix M, Section 1.5.10	II.D.2
Appendix M, Section 1.5.11	II.B.5
Appendix M, Section 1.5.12	II.B.5
Appendix M, Section 1.5.13	II.E
Appendix M, Section 1.6	II.B.5, II.E
Appendix M, Section 1.6.1	II.B.5
Appendix M, Section 1.6.3	II.B.5
Appendix M, Section 1.6.5	II.B.5
Appendix M, Section 1.7	II.B.5
Appendix M, Section 1.7.3	II.B.5
Appendix M, Section 1.7.4	II.D.1
Appendix M, Section 2	II.B.5
Appendix M, Section 2.1	II.B.5
Appendix M, Section 2.2	II.B.5
Appendix M, Section 2.2.1	II.B.5
Appendix M, Section 2.3	II.B.5
Appendix M, Section 2.3.2	II.B.5

<b>New or Modified ISO Tariff Provision</b>	<b>Section(s) of Transmission Letter</b>
Appendix M, Section 2.3.3	II.B.5
Appendix M, Section 2.3.4	II.B.5
Appendix M, Section 2.3.8	III
Appendix M, Section 2.4	II.B.5
Appendix M, Section 2.4.1	II.B.5, II.D.3
Appendix M, Section 2.5	II.B.5
Appendix M, Section 2.5.1	II.B.5
Appendix M, Section 2.5.2	II.B.5
Appendix M, Section 2.5.5	II.E
Appendix M, Section 2.5.8	II.D.2
Appendix M, Section 2.5.9	II.B.5
Appendix M, Section 2.5.10	II.B.5
Appendix M, Section 2.6	II.B.5
Appendix M, Section 2.6.2	II.B.5
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Appendix N, Section 1.2	II.C.4
Appendix N, Section 1.2.1.1	II.D.1
Appendix N, Section 1.2.1.3	II.E
Appendix N, Section 1.2.1.4	II.C.4
Appendix N, Section 1.2.1.5	II.C.4
Appendix N, Section 1.2.1.9	II.C.4
Appendix N, Section 1.2.1.10	II.D.2
Appendix N, Section 1.2.1.11	II.C.4
Appendix N, Section 1.2.1.15	II.D.3
Appendix N, Section 1.2.2.1	II.C.4
Appendix N, Section 1.2.2.3	II.E
Appendix N, Section 1.2.2.4	II.E
Appendix N, Section 1.2.3	II.C.4
Appendix N, Section 1.2.3.1	II.C.4
Appendix N, Section 1.2.3.5.1	II.C.4
Appendix N, Section 1.2.3.5.2	II.C.4
Appendix N, Section 1.3	II.C.4
Appendix N, Section 2	II.C.4
Appendix N, Section 2.1.1	II.C.4
Appendix N, Section 2.2	II.C.4
Appendix N, Section 2.2.1.2	II.C.4
Appendix N, Section 2.2.1.3	II.C.4
Appendix N, Section 2.2.1.5	II.C.4
Appendix N, Section 2.2.1.10	II.E



<b>New or Modified ISO Tariff Provision</b>	<b>Section(s) of Transmission Letter</b>
Appendix N, Section 2.2.1.11	II.D.3
Appendix N, Section 2.2.2.1	II.C.4, II.D.2
Appendix N, Section 2.2.2.3	II.C.4
Appendix N, Section 2.2.3.2	II.C.4, II.D.1
Appendix N, Section 2.2.3.5	II.C.4
Appendix N, Section 2.3	II.C.4
Appendix Q – eligible intermittent resources protocol	II.D.2
Appendix Q, Section 2.2.1	II.D.2
Appendix Q, Section 2.2.2	II.D.2

**Attachment D**

**Dynamic Transfer Final Proposal**

**Dynamic Transfer Tariff Amendment  
July 29, 2011**



**California ISO**  
Shaping a Renewed Future

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# **Dynamic Transfers Final Proposal**

**Provided in Support of 2009-2011 Stakeholder Process to Consider  
Expansion of Dynamic Transfer Services in ISO Tariff**

**May 2, 2011**

# Dynamic Transfers Final Proposal

This Final Proposal updates the April 1, 2011, Second Supplement to Revised Draft Final Proposal to reflect the completion of this stakeholder process at the stakeholder meeting on April 8, 2011, and subsequent stakeholder comments on April 15, 2011. Revisions since the Second Supplement to Revised Draft Final Proposal are identified in a separate document containing a summary of the April 15 stakeholder comments and ISO responses to those comments. The ISO will present the conclusions of this stakeholder process at the May 2011 Board of Governors meeting.

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## 1. Background

The objective of this Final Proposal is to propose solutions to issues affecting dynamic scheduling as presently offered in the California Independent System Operator (ISO) tariff, and to develop solutions for extending the ISO's dynamic scheduling policy into tariff provisions for pseudo-ties.<sup>1</sup>

The ISO published its Dynamic Transfers Straw Proposal in this stakeholder process on March 10, 2010 (available at <http://www.aiso.com/2755/2755e7b852d20.pdf>), and discussed it in a stakeholder meeting on March 17.<sup>2</sup> The objective of the Straw Proposal was to describe the functions of dynamic scheduling and pseudo-ties, propose solutions to issues affecting dynamic scheduling as presently offered in the ISO tariff, and develop solutions for extending the ISO's dynamic scheduling policy into tariff provisions for pseudo-ties. A Supplement to the Straw Proposal (available at <http://www.aiso.com/2787/2787c64b6e390.pdf>) provided additional discussion with stakeholders on selected issues prior to publishing a Draft Final Proposal. The Draft Final Proposal (published on May 20, 2010, and available at <http://www.aiso.com/279c/279c8cae45e20.pdf>) stated the ISO management's conclusions, based on these stakeholder discussions, about the following policies to recommend to the ISO's Board of Governors to facilitate the use of the ISO's dynamic transfer services:

1. Clarifying tariff provisions for conventional resources,
2. Extending the existing use of dynamic scheduling for imports of conventional resources to include dynamic transfer of intermittent or "renewable" energy resources into the ISO from other balancing authority areas (BAAs) and to dynamic exports, and
3. Incorporation of pseudo-tie service in the ISO tariff, including intermittent resources, predicated upon the successful culmination of the two present conventional resource pseudo tie pilots.

Two supplements to the Draft Final Proposal (available at <http://www.aiso.com/27b2/27b2c77c63e0.pdf> and <http://www.aiso.com/27d3/27d383ed3e3f0.pdf>), and a previous Revised Draft Final Proposal (published on August 16, 2010, and available at <http://www.aiso.com/27f4/27f4b6ec14ef0.pdf>) have further explored the specific topic of managing requests for dynamic transfer agreements

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<sup>1</sup> These documents apply to dynamic transfers as a category of market participation, and use the term "dynamic transfer" as a general term that applies to either dynamic schedules or pseudo-ties. ("Dynamic import" and "dynamic export" refer to dynamic transfers in a specific direction.) The term "dynamic schedule" refers to an interchange schedule in which the resource remains under the control of the native balancing authority (BA) where the source of transfer is electrically located, and the native BA includes the resource's output in its balancing of supply and demand. The term "pseudo-tie" refers to a transfer in which the source is accounted for in the attaining BA's balance. The attaining BA also performs other balancing area functions for pseudo-tie resources. Appendix A of the Straw Proposal explains these characteristics of dynamic transfers in greater detail. The ISO attempts to use these terms precisely to explain provisions of the proposal that apply to the respective terms.

The ISO also attempts to distinguish appropriately between the terms "balancing authority" (BA) and "balancing authority area" (BAA). A BA is an entity that manages a BAA. For example, the ISO as a company is a BA that maintains the balance of loads, interchange, and generation within the metered boundaries of its BAA.

<sup>2</sup> The stakeholder process began with the ISO's Issue Paper, which was published on November 30, 2009 (available at <http://www.aiso.com/2476/2476ecfa5f550.pdf>) and discussed in a stakeholder meeting on December 7, to identify the issues that should be considered in this stakeholder process.

for intermittent resources, and the Market Surveillance Committee has adopted an opinion concerning this topic (available at <http://www.aiso.com/27e9/27e9d6297bf0.pdf>). Discussions of these documents showed that the ISO would not be able to resolve the underlying issues without an analysis of the ISO's dynamic transfer capability for intermittent resources, and the ISO completed a study, through a contract with General Electric (GE Energy), and published the results in a Draft Final Report on December 10, 2010, and Final Report on Impact of Dynamic Schedules on Interfaces on January 6, 2011 (available at <http://www.aiso.com/2aff/2aff9e9150530.pdf>). A Revised Draft Final Proposal published on February 18, 2011 (available at <http://www.aiso.com/2b29/2b29c05056f10.pdf>) updated the ISO's conclusions to date on this topic, as well as adding clarifying discussions in response to the ISO's conclusions on other topics. The ISO reviewed that document at a stakeholder meeting on February 25 and conference call on April 8, and the Final Proposal that is now being published updates the document for the results of those discussions and subsequent stakeholder comments.

A fundamental present day issue is the import of intermittent, renewable energy on the interties (i.e., between BAAs). Extending the ISO dynamic transfer and pseudo-tie service to intermittent renewable resources raises issues the ISO has not encountered with dynamic transfer of conventional resources. While the ISO faces many of these issues with intermittent resources that are native to the ISO BAA, significant growth of intermittent resources could involve bringing intermittent power into the control and responsibility of the ISO through dynamic transfer arrangements. Neither the North American Electric Reliability Corporation (NERC) nor Western Electricity Coordinating Council (WECC) policies directly address the implementation of dynamic transfers associated with renewable or "intermittent" resources. Accordingly, various efforts are underway within the WECC to consider how to implement, operate and account for the coordinated interchange of intermittent energy from source to sink BAAs. The use of dynamic transfer functionality to establish pseudo-ties under a market construct is also a relatively new and currently rarely used concept in the West.

With the advent of the 20 and 33 percent renewable portfolio standards for California load, the frequency of requests to the ISO for dynamic scheduling based import services has increased dramatically. Over the past year, multiple independent power project developers of external conventional and intermittent generation resources have inquired to the ISO about participation in various ISO markets and renewable energy programs, including the Participating Intermittent Resource Program (PIRP). In comments on the ISO's Issue Paper, PG&E states that dynamic transfer is essential for incorporating out-of-ISO renewable resources into PG&E's resource portfolio, and "Six Cities" (Anaheim, Azusa, Banning, Colton, Pasadena & Riverside) state they have already contracted outside the ISO and cannot get power to their cities due to the current ISO tariff and procedures.

Developers representing both conventional and renewable energy projects seek operating and scheduling services that face hurdles due to concerns for the potential grid reliability impacts and increased balancing energy burden. Their ISO service requests include the ability to dynamically schedule renewable energy imports into the ISO, dynamic imports from "single generator" BAAs, and the implementation of additional pseudo-ties for both conventional and renewable external resources. A particular concern in considering these requests is the ability of an external intermittent resource to be immediately responsive to interchange schedule (electronic tag, or "e-Tag") curtailment and decremental dispatch instructions in the event of real time intertie derate or contingency event.

To further address these issues, the ISO discussed the Second Supplement to the Revised Draft Final Proposal in a stakeholder conference call on April 8, 2011, after which the ISO

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received stakeholder comments and prepared its final recommendations to its Board of Governors. The key dates in the schedule of the dynamic transfer tariff initiative are as follows:

November 30, 2009	Issue Paper published
December 7, 2009	Stakeholder meeting on Issue Paper
December 14, 2009	Stakeholder comments received on Issue Paper
March 10, 2010	Straw Proposal published
March 17, 2010	Stakeholder meeting on Straw Proposal
March 31, 2010	Stakeholder comments received on Straw Proposal
April 29, 2010	Supplement to Straw Proposal published
May 6, 2010	Stakeholder meeting on Supplement to Straw Proposal
May 13, 2010	Stakeholder comments received on Supplement to Straw Proposal
May 20, 2010	Draft Final Proposal published
May 27, 2010	Stakeholder meeting on Draft Final Proposal
June 10, 2010	Stakeholder comments received on Draft Final Proposal
June 11, 2010	Supplement to Draft Final Proposal published
June 18, 2010	Stakeholder conference call on Supplement to Draft Final Proposal
June 30, 2010	Stakeholder comments received on Supplement to Draft Final Proposal
July 14, 2010	Second Supplement to Draft Final Proposal published
July 21, 2010	Stakeholder conference call on Second Supplement to Draft Final Proposal
July 28, 2010	Stakeholder comments received on Second Supplement to Draft Final Proposal
August 5, 2010	Market Surveillance Committee Opinion adopted (MSC conference call)
August 16, 2010	Revised Draft Final Proposal published
August 23, 2010	Stakeholder conference call on Revised Draft Final Proposal
September 7, 2010	Stakeholder comments received on Revised Draft Final Proposal
October 6, 2010	Stakeholder conference call on Dynamic Transfer Study
October 13, 2010	Stakeholder comments received on Dynamic Transfer Study
November 12, 2010	Summary of October 2010 Stakeholder Comments and ISO Responses on Intermittent Dynamic Transfer Capability Study published
November 19, 2010	Stakeholder conference call on Impact of Dynamic Schedules on California-Oregon Intertie and West-Of-River
December 3, 2010	Stakeholder comments received on Intermittent Dynamic Transfer Capability Study
December 10, 2010	Draft Final Report on Impact of Dynamic Schedules on Interfaces published

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December 17, 2010	Stakeholder conference call on Draft Final Report on Impact of Dynamic Schedules on Interfaces
December 27, 2010	Stakeholder comments received on Draft Final Report on Impact of Dynamic Schedules on Interfaces
January 7, 2011	Final Report on Impact of Dynamic Schedules on Interfaces published
January 27, 2011	Discussion Paper for February 1, 2011, Conference Call in Dynamic Transfer Stakeholder Process published
February 1, 2011	Stakeholder conference call on Status Update in Dynamic Transfer Stakeholder Process
February 8, 2011	Stakeholder comments received on Dynamic Transfers Discussion Paper
February 18, 2011	Supplement to Revised Draft Final Proposal published
February 25, 2011	Stakeholder meeting on Supplement to Revised Draft Final Proposal
March 11, 2011	Stakeholder comments received on Supplement to Revised Draft Final Proposal
April 1, 2011	Second Supplement to Revised Draft Final Proposal published
April 8, 2011	Stakeholder meeting on Second Supplement to Revised Draft Final Proposal
April 15, 2011	Stakeholder comments received on Second Supplement to Revised Draft Final Proposal
May 2, 2011	Final Proposal published
May 18-19, 2011	Target Board of Governors decision on Dynamic Transfer initiative
June 2011	Target Tariff filing submitted to FERC for approval of Dynamic Transfer tariff changes.

The ISO has benefited from the comments that stakeholders submitted on the series of documents throughout the course of this stakeholder process, and thanks the commenters.

## **2. Summary of Proposal**

To address the needs described above, this Final Proposal addresses the expansion of dynamic transfer tariff service to incorporate these additional uses of dynamic transfer functionality, considering both the potential benefits and maintenance of grid reliability. Proposals cover the following topics:

- **Transmission reservations:** To account for the variation in renewable resources' output, allow dynamic transfers to specify maximum deliveries exceeding their expected average delivery. Given that the ISO provides hourly firm transmission and requires external transmission to be procured only for each operating hour, discourage excess transmission scheduling through settlement of congestion charges and the ISO's grid management charge for the greater of scheduled and actual delivery.<sup>3</sup>

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<sup>3</sup> A stakeholder comment on the Straw Proposal questioned why the ISO treats resources connecting to Palo Verde substation as imports that are subject to intertie scheduling constraints, which differs from resources that might connect to Eldorado substation being considered to be within the ISO BAA.



- Congestion management: To efficiently dispatch all ISO resources over the real-time operating horizon, offer a scheduling option to intermittent resources to update their expected energy profile availability by 5-minute intervals, for a forward-looking two-hour period, to manage variability within operating hours and maintain high transmission utilization by dispatching other resources.
- Dispatchability requirements and curtailment rules: Ensure that dynamically transferred resources can immediately respond to interchange schedule (e-Tag) curtailment and decremental dispatch instructions and orders in the event of real time intertie derate or contingency event. Develop operating procedures to reflect characteristics of new resources, and use operating orders to facilitate compliance with reliability needs.
- Locational pricing: Model and price dynamic resource-specific system resources (including pseudo-ties) at their actual locations, as the ISO does currently for the Sutter pseudo-tie (using the same mechanism that determines prices at scheduling points, such as Four Corners, that are not at the ISO boundary).
- Pro rata allocation of deviations among BAAs: Update tariff provisions to incorporate pro rata allocation of uninstructed deviations into the ISO tariff as an upper limit on the ISO's allocation of deviations.
- Limits of dynamic imports: As part of the ISO's overall operational response to increasing levels of generation by intermittent resources, monitor any operational issues that relate to dynamic transfers, and coordinate with other affected BAAs to study regional issues affecting dynamic transfer capability. The ISO's technical studies during the course of this stakeholder process concerning the potential for maximum dynamic transfer limits for intermittent resources have concluded that no limits need to be applied within the ISO's BAA at this time. If such limitations become apparent in the future, the ISO will identify appropriate responses, including potentially limiting new dynamic transfers of intermittent resources, but would not limit dynamic transfers that would have already been established.

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This comment suggests that resources at Palo Verde should not be subject to intertie limits and other provisions that apply to pseudo-ties, since SCE owns the Palo Verde-Devers line and is part owner of Palo Verde substation, which it claims is similar to ownership at Eldorado. The difference between these locations is that even though both substations have multiple owners, the intertie point and associated metering at Eldorado substation establishing the boundary between the ISO BAA and its neighboring BAAs effectively place this substation inside the ISO BAA boundary, while the intertie points and associated metering at Palo Verde substation establishing the boundary between the ISO BAA and its neighboring BAAs effectively place this substation outside the ISO BAA boundary. Neither the Palo Verde nor Hassayampa substation has been placed under ISO operational control as either ISO BAA or ISO Controlled Grid, which requires that schedules from the Palo Verde Hub are subject to the same requirements as other imports, even when they are dynamic transfers. On the Merchant to Eldorado 230 kV intertie, the point of interconnection is at a transmission tower on the Merchant side of Eldorado substation. On the Palo Verde to Devers and Hassayampa to North Gila 500 kV intertie lines, the points of interconnection are at the boundaries of the 500 kV switchyards, not at the buses that terminate the 500 kV lines. Thus, a pseudo-tie resource that connects through generation ties to buses at Palo Verde or Hassayampa must first schedule as an export from the boundary of the pseudo-tie, and then import back to the ISO at these points of interconnection, where the resource is scheduled as an import to the ISO. The functions of dynamic schedules and pseudo-ties are described in NERC's Dynamic Transfer Reference Document, which is available at <http://www.nerc.com/filez/rfwg.html>, which states (among other provisions) that a pseudo-tie is used as a tie line flow in the AGC/ACE equation, and that pseudo-ties are accounted for as "actual interchange" while dynamic schedules are counted for as "scheduled interchange" (i.e., both are interchange calculations).

- Management of requests for dynamic transfers: To allow market participants who are developing or contracting for new dynamically transferred resources to self-manage risks that their projects, combined with existing dynamic transfers, do not exceed the available transfer capability, determine procedures for sharing data regarding dynamic transfer agreements that have been registered and/or are operational at specific interties.
- Aggregation of conventional and/or renewable resources: Support aggregation of resources that are electrically close together.
- Generator-only BAAs: As with any resource seeking to dynamically import into the ISO, the ISO will approve dynamic scheduling agreements in which performance terms and conditions, supported by successful management of inadvertent energy and sufficient contingency reserves, indicate that the resource will reliably perform as a dynamic schedule.
- Dynamic exports: Allow dynamic exports of supply resources that are geographically within the ISO's BAA.
- Layoffs from pseudo-ties: Continue to support exports to native BAAs from pseudo-tie generators, as the ISO has done in the pilot implementation.
- Multiple dynamic schedules: Allow an external generator to be split in fixed shares as dynamic schedules (not pseudo-ties) that would be scheduled on different interties in order to obtain transmission through external BAAs.
- Non-firm transmission: Allow dynamic schedules for energy to use non-firm transmission through external BAAs.
- Documentation for ancillary service certification: Modify requirements to align certification processes.
- Coordination with neighboring BAAs: Coordinate development of similar market initiatives.

In most of these areas, the ISO's proposals in this Final Proposal are the same as in the Straw Proposal, as modified in the Supplement to the Straw Proposal, and differences in the original and this Final Proposal mostly seek to clarify the explanation of the proposals if needed, as well to refine their details. The Draft Final Proposal added detail concerning the ISO's technical studies of limits on dynamic imports of intermittent resources, and the studies have been completed. The ISO's technical studies have concluded that no dynamic transfer capability limits need to be applied to intermittent resources at this time within the ISO's BAA. As part of the ISO's overall operational response to increasing levels of generation by intermittent resources, the ISO will monitor any operational issues that relate to dynamic transfers, and will coordinate with other affected BAAs to study regional issues affecting dynamic transfer capability. If such limitations become apparent in the future, the ISO will identify appropriate responses, including potentially limiting new dynamic transfers of intermittent resources, but would not limit dynamic transfers that would have already been established. The resolution of these issues will be formalized as needed in revisions to the ISO tariff as approved by the ISO Board of Governors as they pertain to dynamic scheduling, and as an addition of standard contract terms for pseudo-tie imports and dynamic exports.

The overall scope of issues that affect dynamically transferred resources extends beyond the topics that are addressed in this Final Proposal. The ISO maintains coordination among the staff teams that work on related projects, but it is necessary to divide topics among projects in order to keep each project's work manageable, rather than undertaking a global effort that would consider all issues, and thereby risk not achieving outcomes on the critical topics. After considering the alternatives on each issue as to whether to recommend a change in the ISO

tariff in this stakeholder process, consider issues in a related stakeholder process, or establish business processes to improve the ISO's operations within its existing tariff provisions, the ISO has focused this stakeholder process on topics that are specific to dynamic transfers. More general issues that apply to both internal and external resources are being addressed through other stakeholder processes. By applying this guideline, the ISO has been able to manage the scope of this stakeholder process, so that it can come to conclusions on the critical topics that it needs to address.

Therefore, as discussed in the Straw Proposal and subsequent documents, the ISO is not proposing changes in this document concerning the following issues:

- Management of increased load following and regulation requirements: Important consequences of receiving imports supported by intermittent resources, using dynamic transfers, are the variability of the energy delivered by intermittent resources, the difficulty of dispatching or anticipating the amount of delivered energy from intermittent resources, and the potential for increased responsibilities for regulation and load following. These impacts occur with increases in dynamic imports of intermittent resources, as well as with increases in intermittent resources within the ISO BAA. The ISO has concluded that it should maintain comparable charges to internal and external intermittent resources for their contributions to regulation and load following requirements, and has initiated the "Renewables Integration Market and Product Review" stakeholder process that will be a more general review of requirements for intermittent resources, including cost allocation and cost-sharing mechanisms for regulation and load following responsibility. Any charges resulting from that stakeholder process will apply to dynamic schedules and pseudo-ties that begin operation prior to its completion, with no grandfathering exemptions. Information on this stakeholder process is available at <http://www.aiso.com/27be/27beb7931d800.html>.
- Extension or modification of PIRP: Similarly, the "Renewables Integration Market and Product Review" stakeholder process, which is addressing a wide range of market issues concerning intermittent resources in general, is reviewing the PIRP program as a whole, including questions of whether the ISO should expand PIRP to include external resources. The ISO will seek consistent treatment of internal and external resources to the extent possible. However, this will depend on details that are still under development in that stakeholder process. Inclusion of dynamic imports in PIRP will be considered in that process rather than in this one.<sup>4</sup>

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<sup>4</sup> Generators outside the ISO are not currently eligible to participate in PIRP. The current limitation of PIRP eligibility to not include external resources is stated in Appendix Q (Eligible Intermittent Resources Protocol) of the ISO tariff, in which section 2.2.1 requires execution of a Participating Generator Agreement, whereas pseudo-ties execute Pseudo-PGAs instead, and section 2.2.2 requires that a PIRP resource must be connected to the ISO controlled grid, which does not include the connections to pseudo-ties.

A broader category of resources in the ISO tariff is "Eligible Intermittent Resources." The current tariff definition of Eligible Intermittent Resource refers to "Generating Units" (which by the tariff definitions are within the ISO BAA) that are powered by wind or solar energy (with an allowance for a de minimis amount of energy from other sources). The ISO will extend the definition of Eligible Intermittent Resources to include similar generation sources that participate in the ISO's markets through dynamic transfers. On April 30, 2010, FERC conditionally accepted the ISO's proposed tariff revisions, subject to further compliance filings (FERC docket ER10-319-000), to improve its ability to forecast the production from Eligible Intermittent Resources, and to mitigate the operational impacts of variability and uncertainty by receiving specified forecasting and telemetry data and reporting of forced outages. Receiving the same information for dynamic transfers of intermittent resources will be important for maximizing the utilization of inertia capacity and maintaining sufficient unit

- Interconnection standards and transmission planning. The ISO has recently completed stakeholder processes on interconnection standards for renewable resources, and on a revised transmission planning processes, both of which have been presented to the Board of Governors at its May 2010 meeting. Operational issues that the ISO faces as intermittent resources become more prevalent, such as ensuring that it has enough inertia through synchronized capacity to arrest frequency decline following losses of generation, and that apply to both internal and external resources, will similarly be considered in other forums. This stakeholder process on dynamic transfers excludes issues that overlap with the other stakeholder processes.
- Ancillary services and uninstructed deviations: The ISO will maintain its existing tariff provisions concerning responsibility for operating reserves,<sup>5</sup> certification of ancillary services, and financial settlement of uninstructed deviations.
- Dynamic transfers of load: The ISO maintains a willingness to develop pilot agreements for dynamic transfers of load, but has not had operational experience with dynamic transfers of load that would enable identification of appropriate tariff provisions.

In addition, questions arose during the stakeholder process seeking explanations of whether the status of a resource affects a market participant's resource adequacy (RA) portfolio, and whether pseudo-ties might be eligible for being deemed deliverable into the ISO for qualification as RA resources. While the qualification of generation resources within the ISO's BAA includes an assessment of deliverability and a net qualifying capacity value, and dynamic system resources are treated the same as generators in many ways, under ISO tariff section 40.8.1.12.1 except that these deliverability assessments do not apply to imports. Rather, eligibility as a RA resource is contingent upon a showing by the scheduling coordinator (SC) that the dynamic system resource has secured transmission through any intervening BAAs for the applicable operating hours that cannot be curtailed for economic reasons or bumped by higher priority transmission, and that the load serving entity (LSE) has an allocation of import capacity at the import scheduling point under ISO tariff section 40.4.6.2 that is not less than the resource adequacy capacity provided by the dynamic system resource. Variable resources within the ISO have an additional protocol for establishing qualifying capacity, in which decision D.09-06-028 of the California Public Utilities Commission established an exceedance methodology to determine qualifying capacity for wind and solar resources. The ISO proposes to apply the same exceedance methodology used for establishing qualifying capacity for variable resources within the ISO to resources importing to the ISO including dynamic transfers of variable resources.

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commitment of dispatchable generation to manage variations in external as well as internal intermittent resources.

<sup>5</sup> Under Section 6.4 of the ISO tariff's Appendix X, the ISO treats firm dynamically scheduled energy as a resource contingent import, and procures (or allows for self-provision of) operating reserves. ISO tariff Section 8.2.3 provides that the ISO must maintain regulation service and operating reserves as required by NERC and WECC reliability standards. ISO tariff section 11.10.4.2 states the unit-contingent imports' obligation for operating reserves. The ISO is aware that discussions in WECC committees are considering changes in reserve requirements, and is monitoring those discussions. If NERC and WECC requirements change in the future to require different amounts of regulation service or operating reserves for conventional and/or intermittent resources, the ISO will procure the required services and may make corresponding changes in market participants' allocations of these costs.

The ISO's deliverability assessment for dynamic transfers does not differ from other imports, and the ISO believes it would be undesirable to carve out intertie capacity as a reservation for dynamic transfers (including pseudo-ties), for reasons including the following:

- First, economic inefficiency and possibly harmful shifts in competitive pricing could occur if the ISO were to reserve intertie capacity specifically to serve dynamic transfers. Reserving such capacity would be a fundamental shift in RA policy by assigning the import capacity value to the generator versus the current method of assigning the limited amount of import transmission capacity to the LSEs. Over time LSEs would have much reduced competitive options in making their procurement decisions for RA capacity as potentially more of the import capacity was shift to be assigned to external generators using dynamic transfers. The import transmission capacity is a limited resource, but allocation of such capacity to LSE's allows access to all resources in the WECC region. Assigning a portion of any intertie to a single resource would seem to underutilize the limited import capacity, without the pseudo-tie generator having gone through the ISO interconnection process. Looking into the future, the ISO expects to receive more and more pseudo-tie requests, and allocating capacity to them, away from the LSEs who have the obligation to procure RA capacity, could severely impact the LSEs' choices of RA import capacity.
- Second, the consumers of California may experience a decrease in overall system reliability. The current RA framework for imports allows for energy-based contracts to count towards the capacity-based RA program. This allows California consumers and the ISO to benefit from the full capacity in the WECC to "back" the energy that is expected to flow across the intertie when the RA is called upon. This is true regardless of which generators are online at a particular time. Moving to a designated generator paradigm would cause a reliability reduction because the RA import capacity would not provide service when the RA physical resource experiences a scheduled or forced outage.

Even without a direct deliverability assignment, a pseudo-tie can still become a RA resource since its qualifying capacity is calculated based on the local regulatory authority rules that are applicable to the procuring LSE. This occurs through the existing process in which the procuring LSE assigns its allocation of RA import capacity to the pseudo-tie.

Section 3 of this document describes the proposals offered in this Final Proposal in further detail. The impact of most issues is quite similar for both dynamic schedules and pseudo-ties, and this discussion will distinguish between these scheduling options only if needed, with the proposals applying to both forms of dynamic transfers. For clarity, section 4 summarizes the applicability of the proposals to dynamic schedules versus pseudo-ties. Section 5 highlights areas in which the ISO will need to implement changes to its market and operations systems before the full functionality described herein is available, and identifies the functionality that will be available in the interim. Appendix A of the Straw Proposal described the overall characteristics of dynamic transfers, and will be incorporated into the ISO's Business Practice Manuals after the conclusion of this stakeholder process. Appendix B of the Straw Proposal contained the standard terms of service for pseudo-ties, which the ISO proposes to include in the ISO tariff as a pro forma Pseudo Participating Generator Agreement.<sup>6</sup>

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<sup>6</sup> Both the Sutter and New Melones pseudo-tie pilots have participated successfully in the ISO's markets. This experience has revealed limitations in market functionality, which have not deterred the success of the pilots and are now being resolved. The ISO has developed the Pseudo PGA for Copper Mountain by refining the terms of the initial pilots, and now proposes the terms of the Copper Mountain pilot as the basis for pro forma language to go into the ISO tariff to support pseudo-tie

### 3. Enhancements for Dynamic Transfers

ISO tariff section 4.5.4.3 (Dynamic Scheduling) allows imports of energy and ancillary services from dynamic system resources, provided that: (a) such dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards, including any requirements of the NRC, (b) all operating, technical, and business requirements for dynamic scheduling functionality, as set forth in the Dynamic Scheduling Protocol in Appendix X or posted in standards on the ISO website, are satisfied, (c) the SC for the dynamic system resource executes a dynamic scheduling agreement as provided in Appendix B.5 with the ISO, and (d) all affected native balancing authorities and intermediary balancing authorities each execute with the ISO an Interconnected Balancing Authority Area Operating Agreement or other operating agreement related to the operation of dynamic functionality.<sup>7</sup>

These requirements do not inherently limit dynamic scheduling to certain generation technologies (e.g., conventional vs. intermittent). Given the recent level of interest in dynamic scheduling of renewable resources, what needs to be addressed is to define the ISO's operating, technical, and business requirements, to ensure that dynamic scheduling is technically feasible and consistent with NERC and WECC reliability standards. Like conventional resources, intermittent resources will need to comply with the provisions of the ISO tariff's Dynamic Scheduling Protocol and all other applicable requirements that conventional resources must meet before they can establish a dynamic transfer with the ISO. The tariff

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imports. The key part of the pro forma Pseudo PGA is the statement of terms of service, which the ISO has adapted from the Copper Mountain Pseudo PGA by simply removing resource-specific references, and is Appendix B of the Straw Proposal as the ISO's proposed pro forma contract terms.

An area where a refinement is currently being implemented is in the enforcement of inertia scheduling constraints. Congestion management includes enforcing both (1) flow-based constraints within the ISO BAA, to ensure that flows remain within thermal limits of transmission facilities, adequate voltage support is available throughout the grid, and inter-regional flows do not undermine regional stability, and (2) scheduling constraints that limit the volume of schedules that adjacent BAAs agree can be scheduled on a particular inertia, based on either thermal capacity or contractual limits, regardless of how the resulting energy flows through the grid. Inertia scheduling is limited by both what the ISO calls "market scheduling limits", which place boundaries around scheduling points or sets of scheduling points that can be defined flexibly, but only limit energy schedules, and "inertia" constraints that maintain the sum of energy and ancillary service schedules within the defined limits but have a restriction that a resource can be subject to only one inertia constraint, due to current software functionality. The Sutter pseudo-tie uses network transmission service to support its scheduling through the SMUD BAA (soon to become the BAA of the Balancing Authority of Northern California), which allows delivery to the ISO at multiple alternative scheduling points. Until recently, the ISO was unable to define an inertia constraint that applies to Sutter, because the inertia constraint allows mapping of a resource to only a single inertia. In Sutter's case, this had not been an issue because sufficient transmission has been available across the SMUD to ISO boundary. The possibility of an alternative delivery point for Copper Mountain in the event of an outage of its normal delivery point led the ISO to identify a solution through a market setup script. This is a manually initiated work-around for use in the event of inertia outages, using either network or point-to-point transmission service through other BAAs, but does not support alternative inertia mappings as a routine market function. This is an implementation issue that does not affect the definition of terms of service in the Pseudo PGA.

<sup>7</sup> Tariff changes to implement the policies resulting from this stakeholder process may include renaming the Dynamic Scheduling Protocol to "Dynamic Transfers Protocol", and similar renaming of other documents. Except for obvious changes such as reference to a Pseudo Participating Generator Agreement rather than a Dynamic Scheduling Agreement, the requirements set forth in the existing Dynamic Scheduling Protocol appear to be applicable to pseudo-ties as well as dynamic schedules.

provisions that apply to Eligible Intermittent Resources (as defined in the ISO tariff) that do not participate in PIRP will also be applicable to dynamic transfers of intermittent resources, including communication, telemetry, and forecasting requirements and the provisions of the Eligible Intermittent Resources Protocol (ISO tariff Appendix Q). The ISO's Issue Paper and Straw Proposal identified several additional areas in which operating, technical, and business requirements need to be defined, which are addressed in the following subsections.

### **3.1. Transmission reservations**

As dynamic transfers begin to include intermittent resources, a concern is how to maintain full transmission utilization, while recognizing the variability of intermittent resources' output. A fundamental difference between scheduling generation within the ISO BAA and scheduling dynamic transfers is that dynamic transfers must cross interties, which (1) are subject to specific scheduling constraints that are not necessarily directly the same as constraints of the thermal capacity of the transmission lines and are not determined only by conditions within the ISO BAA, and (2) are subject to NERC and WECC standards that do not apply to schedules within the ISO BAA. Electronic tags (e-Tags) for dynamic scheduling contain capacity values for both expected delivery and maximum delivery. Issues of allocating transmission capacity using e-Tags apply to all interties but do not affect scheduling within the ISO BAA, and thus intertie schedules face requirements that do not apply to resources within the ISO. The ISO's market software manages dynamic schedules using only the value for expected delivery, and this represents the transmission reservation for purposes of the ISO market.<sup>8</sup> However, if (1) a dynamically scheduled intermittent resource were to schedule its average, expected delivery, (2) its reserved transmission matches its energy schedule, and (3) other interchange schedules were accepted up to its intertie's full capacity, the intermittent resource may be unable to deliver more than its initial expected energy schedule. A contrasting concern is that Scheduling Coordinators (SCs) could submit excessive self-schedules to obtain flexibility for exceeding their actual expected, but intermittent, deliveries to the ISO. In this event, the ISO's market systems

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<sup>8</sup> Section 6.1 of Appendix X (Dynamic Scheduling Protocol) of the ISO tariff states: "For any Operating Hour for which Energy and/or Ancillary Services (and associated Energy) is scheduled dynamically to the CAISO from the System Resource, a firm (or non-interruptible for that hour) matching transmission service must be reserved across the entire Dynamic Schedule transmission path external to the CAISO Balancing Authority Area." The intent that the requirement for firm transmission along the external scheduling path does not extend beyond the operating hour is stated on page 10 of the cover letter for Amendment 59: "The ISO's proposed dynamic scheduling policy requires that the Scheduling Coordinator make arrangements for firm, or non-interruptible for the operating hour, transmission service from the host Control Area and through all intermediary Control Areas, if applicable, to the ISO." Section 6.11 of Appendix X further states: "In Real-Time the Dynamic Schedule may not exceed the maximum value established by the sum of the Day-Ahead Market and HASP/RTM accepted Energy and Ancillary Services Bids plus any response to the CAISO's Real-Time Dispatch Instructions. The composite value of the Dynamic Schedule derived from the Day-Ahead and HASP/RTM accepted Bids plus any Dispatch Instruction response represents not only the estimated Dynamic System Resource's Energy but also the transmission reservation on the associated CAISO Scheduling Point." Requiring dynamic transfers to be supported by firm transmission only for each operating hour avoids a concern that requiring long-term transmission contracts outside the ISO could limit the availability of transmission to get to the ISO boundary. The dynamic schedule remains subject to the scheduling practices of other BAAs between the ISO, and the value for maximum delivery may have other significance to other BAAs. If the maximum real-time delivery of a dynamic transfer is limited to less than the resource's maximum capacity ("PMax") by its transmission reservation through a BAA or transmission provider other than the ISO, such limitation should be reported to the ISO as a derate using the ISO's outage management system.

could expect that it would receive more energy from the intermittent resources than they would actually be expected to produce, and may fail to commit sufficient dispatchable capacity to maintain the required energy balance. Excessive scheduling for the purpose of obtaining flexibility for intermittent deliveries could also result in unused transmission capacity that could be used by other market participants. As the use of dynamic transfers grows, the ISO needs to avoid reducing the utilization of the ISO's import capacity.

To resolve these concerns, the ISO will treat the capacity values for expected delivery and maximum delivery, which are separate values in e-Tags for dynamic scheduling ("energy profile" and "transmission profile"), as separate values in market bids and schedules for dynamically transferred resources. In the day-ahead market and hour-ahead scheduling process, both the maximum delivery and expected delivery are subject to the intertie scheduling constraint. If the maximum delivery exceeds the expected delivery, the difference is similar to a capacity reservation for imports of ancillary services.<sup>9</sup> As such, the market bid component for maximum delivery will be supported in both the day-ahead and real-time markets, with a single bid segment, with the same bid cap as energy bids, and a bid floor of \$0. An example of the use of separate bid and schedule components for expected delivery and maximum delivery is a solar photovoltaic generator during morning hours. In a particular hour, the generator's output is expected to be 30 MW at the start of the hour and 50 MW at the end of the hour, with the average delivery being 40 MW. This generator may choose to submit a self-schedule for an expected energy delivery of 40 MW and a bid for a maximum delivery of 50 MW, thereby assuring that it will have a transmission reservation sufficient to support its 50 MW delivery at the end of the hour.<sup>10</sup>

Depending on environmental conditions (e.g., wind speed or cloud cover), an intermittent resource's potential delivery may vary as high as its installed capacity. However, the output of a dispatchable generator is controllable, and will not be dispatched above its self-schedule or the maximum capacity of its submitted economic bid. Thus, the ISO will limit an intermittent resource's transmission reservation to no more than the maximum capacity stated in its dynamic transfer agreement. In addition, the ISO recognizes that a non-intermittent resource would not be dispatched above the maximum capacity offered in its economic bid. Thus, for non-intermittent resources, the ISO proposes to limit the transmission reservation (i.e., the sum of the resource's initial energy schedule and ancillary service awards, plus any additional capacity to allow for a real-time increase in output as sent in dispatches) to no more than the highest offered capacity in its submitted bid. Furthermore, the ISO does not intend that energy schedules or transmission reservations for dynamic transfers should state unrealistically high or low values for the resources' actual average and maximum delivery. For example, schedules for dynamic transfers are not an allowable method for implicit virtual bidding, and are subject to the provisions that are applicable in general to convergence bidding for other resources in the

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<sup>9</sup> An energy schedule or ancillary service award on an intertie automatically carries a transmission reservation in the existing ISO markets. Both must be confirmed using an e-Tag. There is currently no ability to acquire transmission across an intertie in the ISO market separately from the energy and ancillary service schedules, for which the transmission reservation in the ISO market exactly equals the energy and ancillary service schedule. It would not be meaningful for a static energy schedule to reserve additional transmission capacity, because the static energy schedule cannot be increased during the operating hour (except for the defined inter-hour ramping). The questions of establishing additional transmission reservations apply only to dynamic transfers, which receive dispatches within the operating hour to follow the ISO's system conditions or an intermittent resource's availability.

<sup>10</sup> The ISO will continue to support self-scheduling of energy, but does not propose to add self-scheduling of transmission reservations.



ISO markets. Similarly, if expanding the implementation of dynamic transfers reduces the forward scheduling into the ISO's market, the ISO will consider appropriate modifications.

To discourage submission of self-schedules for intermittent resources that exceed their actual expected delivery, the ISO will base settlements of dynamic transfers for the congestion component of the ISO's locational marginal prices (LMPs) and the ISO's grid management charge on the greater of scheduled transmission reservations and actual delivery.<sup>11</sup> Schedules for dynamic transfers are not required to submit transmission reservations that exceed their expected actual delivery. However, in recognition that an intermittent dynamic resource's maximum delivery can exceed its average delivery, the ISO is offering the flexibility to schedule the additional transmission capacity that the intermittent dynamic resource chooses to reserve. When an intermittent dynamic resource does schedule additional capacity beyond its expected average delivery, doing so reduces the transmission capacity that is available to other market participants, and it is appropriate to pay for the transmission reservation. In considering whether to reserve capacity beyond its expected average delivery, a dynamic resource would consider that its real-time dispatch (including the scheduling options discussed in section 3.2) may exceed its maximum transmission reservation, as recallable transmission, if non-recallable scheduled use and other recallable scheduled use of transmission have not filled the available capacity.<sup>12</sup>

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<sup>11</sup> Specifically, the congestion charge for a transmission reservation in excess of the energy schedule will be set by the shadow price of the intertie scheduling constraint ("ITC") that applies to the dynamically transferred resource, in the market where the transmission reservation is awarded (day-ahead market or hour-ahead scheduling process). To avoid double-charging for congestion, the settlement price for the resource's real-time energy delivery up to its transmission reservation will exclude the real-time market's shadow price for that intertie scheduling constraint. The full congestion charge would apply to deliveries above the transmission reservation. In the event that a dynamic transfer's real-time delivery relieves congestion (for example, by a reduction from its day-ahead schedule), credit for the relief of congestion will still be paid, at the real-time shadow price of the intertie scheduling constraint.

For example, consider a dynamically transferred resource that schedules 90 MW of energy and establishes a 100 MW transmission reservation in the day-ahead market, and then delivers 120 MW in real-time, using the Palo Verde scheduling point. This resource would be paid the day-ahead LMP at Palo Verde for its 90 MW energy schedule, and charged the day-ahead shadow price of the Palo Verde ITC when it establishes its additional 10 MW transmission reservation. Path 26 may also be congested in the day-ahead market, and the Path 26 shadow price affects the Palo Verde LMP for its 90 MW day-ahead energy schedule but would not be included in the resource's day-ahead congestion price for the transmission reservation. This is because the transmission reservation affects scheduling on the Palo Verde intertie, but does not directly affect the flow on Path 26.

If the Palo Verde ITC is then congested in the real-time market, the resource's settlement would not include the real-time Palo Verde ITC's shadow price for its first 100 MW of energy delivery because this capacity was already purchased in the day-ahead market, but would be subject to the real-time Palo Verde ITC shadow price for the delivery above 100 MW. If Path 26 remains congested in the real-time market, the resource's real-time energy settlement would include the impact of Path 26 congestion for the full amount of its increase from 90 to 120 MW.

<sup>12</sup> The capability for a resource's real-time dispatch to exceed its day-ahead or hour-ahead transmission reservation can be useful for a dispatchable dynamic transfer as well as for an intermittent dynamic transfer, by allowing the resource to be dispatched for peaking capacity when needed by the ISO's system conditions, when transmission capacity is available in real-time. A fast-start peaker may choose to submit an economic bid without establishing a day-ahead or hour-ahead transmission reservation, and be available for real-time dispatch on a similar basis as a peaker within the ISO's BAA. To accommodate this, the ISO will clarify Section 6.8 of Appendix X of the ISO tariff (which now states: "If there is no Dynamic Schedule in the CAISO's Day-Ahead Market, or HASP/RTM the

The existing tariff sections 11.10.1.1.1 and 11.10.9.1 establish the congestion charges and credits, respectively, assessed for a dynamic system resource that is providing ancillary services becoming undeliverable due to a transmission derate. The ISO will clarify these sections to be applicable to all dynamic transfers including pseudo-ties that are providing ancillary services. Furthermore, similar provisions will apply for credits for release of transmission reservation that occur prior to the hour-ahead scheduling process (HASP) due to a transmission derate.

### **3.2. Congestion management**

The previous section has addressed a portion of the ISO's concern for maintaining full transmission utilization while recognizing the variability of intermittent resources' output, by allowing intermittent resources to reserve sufficient transmission to accommodate their realistic levels of variable deliveries, while informing the ISO of their actual expected delivery, and while discouraging excessive requests for transmission reservations. However, there is a remaining concern that transmission usage at any particular time could be just a fraction of the available capacity, at the same time that the market awards for maximum delivery have fully reserved the available transmission (i.e., appearing to be congestion). If the example in the previous section, in which a solar generator has an expected energy delivery of 40 MW and a maximum delivery of 50 MW, is extrapolated into hundreds of MW of dynamically scheduled intermittent resources whose average delivery is a small fraction of their maximum capacity, the concern becomes significant.

If the ISO has knowledge of how a dynamically scheduled resource's output will vary within the operating hour for which the market bid has been submitted, the ISO can minimize the underutilization of transmission capacity. For resources that are dispatchable through price-responsive bids or as regulation reserve, the ISO can manage the variation of the resource's output. The ISO proposes to offer a scheduling option for dynamic transfers of Eligible Intermittent Resources, which will allow these resources to adjust their dynamic schedules for variations in their availability within the operating hour, for reasons other than price-responsive dispatches or response as regulation reserve.<sup>13</sup> The proposed scheduling option will leverage the market functionality that was initially developed to support Metered Subsystems (MSS).<sup>14</sup> The dynamic schedule would not become an MSS. Rather, the dynamic resource would be recognized in some ISO software systems as having a variable schedule, which in this case would be reported to the ISO as its expected output during 5-minute time intervals during a two-hour look-ahead period. The ISO sends the value to the resource as the ISO's dispatch (assuming no reduction due to congestion), in somewhat the same manner that a MSS informs the ISO where its load-following resources will be operating, after which the ISO echoes back the operating point as a dispatch. SCs representing intermittent dynamically transferred

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dynamic signal must be at "zero" ("0") except when in response to CAISO's Dispatch Instructions associated with accepted Ancillary Services Bids") to be applicable to imbalance energy as well as ancillary services.

<sup>13</sup> Non-intermittent resources already have the ability to report reductions in their availability through the ISO's "SLIC" outage reporting software system. Intermittent resources are also expected to report reductions in their availability that are due to equipment outages or derates, but SLIC is not designed to be able to handle the very frequent changes in meteorological conditions that affect wind and solar generators.

<sup>14</sup> An MSS is an electric utility system located within the ISO BAA, which has operated before the ISO's formation as a municipal utility, water district, irrigation district, state agency or federal power marketing authority, as defined more specifically in the ISO tariff.

resources would initially submit hourly self-schedules and/or economic bids for their forecast of expected delivery, concurrently with the ISO receiving bids for static interchange schedules in the hour-ahead scheduling process, allowing the ISO to optimize transmission reservations for static and dynamic schedules before using the updated forecasts of expected delivery during real-time interval dispatch. In the real-time market, the resources' availability as reported to the ISO (or as observed from telemetry, if an SC has not reported its availability) becomes an upper limit on the ISO's dispatch instructions. If an SC has submitted an economic bid for reductions in delivery below its resource's availability, the ISO's real-time economic dispatch will schedule the resource at or below its availability. The ability of resources to submit economic bids for decremental dispatch below their availability allows market participants to limit their exposure to negative LMPs that can result from congestion, over-supply, or other system conditions, and provides the ISO with increased flexibility for managing these system conditions.<sup>15</sup>

By adding this capability, the ISO allows Eligible Intermittent Resources that are dynamically transferred into the ISO to choose between two scheduling options:<sup>16</sup>

1. The resource may designate its expected delivery and maximum delivery in its day-ahead and real-time bid submission. During the operating hour, the ISO will use its internal systems to forecast the resource's delivery, for use in its overall unit commitment and dispatch for the ISO BAA as a whole.<sup>17</sup> Initially, the ISO will use the most recent available telemetry reporting of the resource's output as its expected deliverability and real-time dispatch for the next dispatch interval (adjusted downward if necessary due to congestion), and will continue its efforts to improve its forecasting capability for intermittent resources. This option uses existing ISO market software functionality.<sup>18</sup>

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<sup>15</sup> The real-time dispatch operating target sent by the ISO, combined with the day-ahead schedule, defines the instructed imbalance energy for financial settlements. Because reductions from day-ahead schedules to maximum availability are determined by resource limitations rather than the ISO's real-time dispatch, these reductions are not subject to bid cost recovery. The ISO's Renewables Integration Market and Product Review stakeholder process may determine additional settlement principles that would apply to intermittent resources in general.

<sup>16</sup> By default, the ISO will utilize the rolling persistence schedule to provide 5-minute updates, as it does now for intermittent resources within the ISO's BAA. Once the ISO has implemented a market participant's selection of the option to self-provide forward-looking forecast data, the ISO will use the market participant's forecast whenever it is provided, but will revert to dispatching based on telemetry if the market participant does not provide a forecast. In addition, when the market participant has chosen the option to self-provide its forecast, it will determine how it will calculate its forecast, and could use different methods at different times. For example, the market participant could forecast its availability using a typical-day profile during ramping periods (e.g., a solar generator at sunrise and sunset), then base its forecast on its most recent telemetry during times of day when changes from interval to interval do not follow a regular pattern, and develop its own method for transitioning from one approach to the other.

<sup>17</sup> The ISO requires Eligible Intermittent Resources to provide meteorological data to enable the ISO to forecast the intermittent resource's output, comparable to data required under PIRP. The ISO will extend the definition of Eligible Intermittent Resources to include dynamically transferred resources with the same characteristics as for internal resources.

<sup>18</sup> Internally, the ISO's market systems flag the resource as being "non-compliant" in the sense that the resource is not expected to follow an economic dispatch. Instead, the ISO issues dispatch instructions to remain at its current output, or in the case of real-time congestion or over-generation, instructions to reduce output. The term "non-compliant" in this context has no implication for other compliance monitoring, such as the ISO's rules of conduct.

2. Using the new functionality, the resource may designate its expected delivery and maximum delivery in its day-ahead and real-time bids, and then submit its own forecast of its availability during the operating hour. Its reported availability would perhaps be based on its own forecast or other arrangements such as firming and shaping services that it receives outside the ISO markets. The ISO will return the reported availability during the next 5-minute dispatch interval as the resource's dispatch, adjusted downward if necessary due to congestion. The ISO will monitor the submitted forecasts of availability, compared to actual deliveries and the ISO's own forecasts of availability, and will expect the submitted forecasts to reflect the then-current capability of forecasting technology.

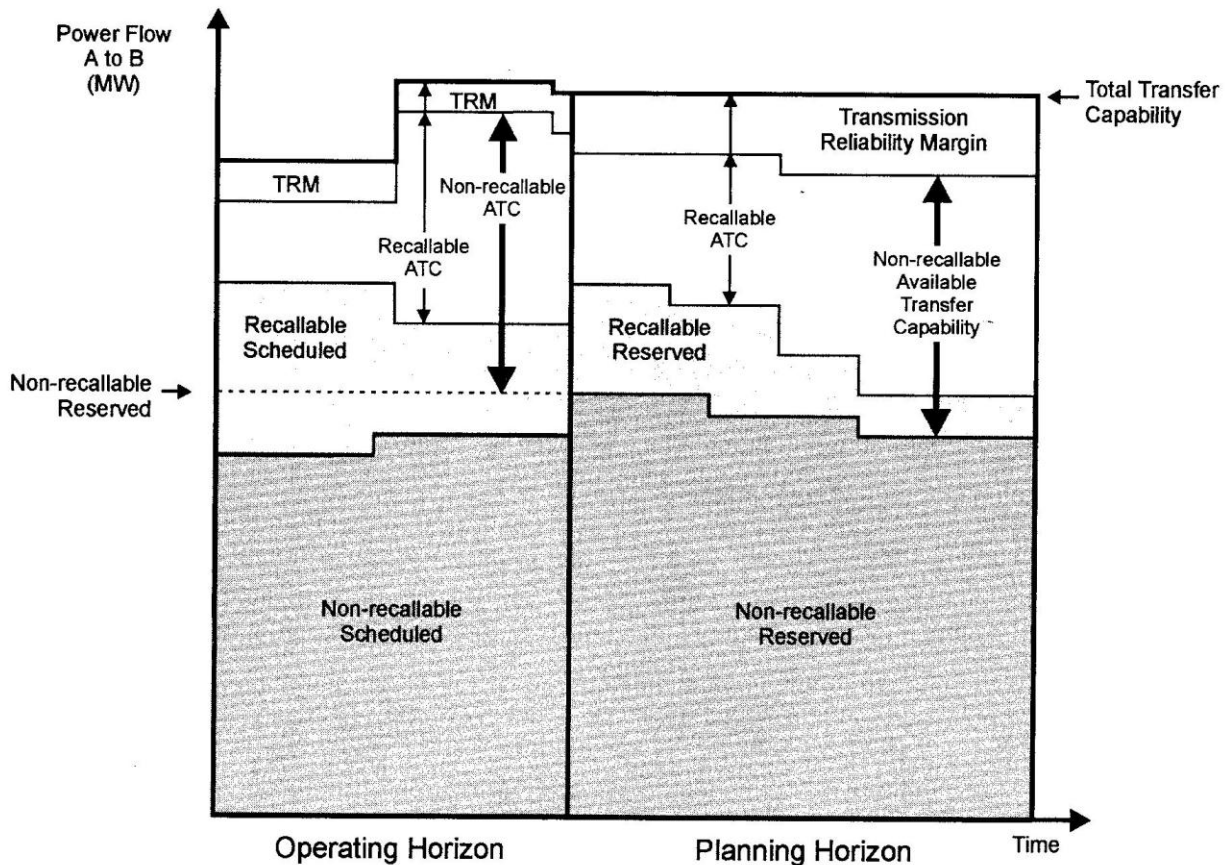
Using either option, the ISO's dispatch defines the instructed operating point for the resource during the next real-time dispatch interval, which is the basis for financial settlements of instructed and uninstructed energy. Such a mechanism will allow a dynamic resource to manage its real-time schedule, which affects its energy settlement. This mechanism also allows the ISO to maintain efficient operation of its interties and internal transmission by dispatching other resources that can respond to the availability of transmission, in two ways: (1) the ISO will be aware of upcoming changes in delivery from the dynamic transfers, and efficiently dispatch other resources to meet system requirements, and (2) if there is at least one separate, dispatchable dynamic transfer using the same intertie, the ISO can dispatch the other dynamic resource to use the available intertie capacity. The following examples illustrate these interactions:

- If a dynamic intermittent resource with an initial schedule of 100 MW uses an intertie with 400 MW of capacity, and other schedules using the same intertie have not used all of the remaining intertie capacity, the intermittent resource will provide its forecasted delivery to the ISO, which will return the forecast to the resource as its dispatch. If the intermittent resource's forecast were for a decrease to 80 MW, the ISO would return a dispatch instruction of 80 MW. If the intermittent resource's forecast increases to 120 MW and there is available intertie capacity, the ISO's dispatch would be 120 MW.
- If static hourly schedules using the same intertie have been awarded schedules in the day-ahead market or HASP that fully utilize the remaining 300 MW of available capacity, and no other dynamic resources can be dispatched, the intermittent resource would not be able to increase its schedule. If the intermittent resource were to submit a forecast to the ISO that its delivery would increase to 120 MW, the ISO would return a dispatch instruction to remain at 100 MW.
- If there is a second dynamic transfer using the same intertie, which is dispatchable (for example, had submitted an economic bid with a \$50/MWh bid price, and is not subject to operational constraints such as minimum run time that limit the economic bid's availability), the ISO would dispatch the second dynamic transfer to decrease its output to accommodate the intermittent resource's increase in delivery to 120 MW (assuming the intermittent resource has submitted a self-schedule or a bid price less than \$50/MWh). This flexibility allows the ISO to maximize its utilization of intertie capacity.
- Extending the forecast of delivery by the intermittent resource beyond the current dispatch period allows the ISO to dispatch resources based on an understanding of future conditions. If the intermittent resource has a temporary decrease in a self-schedule to 80 MW, which is expected to return to its original level after a few dispatch intervals, the ISO will be able to avoid dispatching other resources that would be sub-optimal later, after considering their operating constraints. If (1) the intermittent resource's output were to decrease to 80 MW without providing a forecast that its delivery would return to 100 MW after 15 minutes, (2) the ISO were to dispatch the start-up of a second dynamic resource that has a 30-minute

minimum run time and that uses the 20 MW of capacity represented by the intermittent resource’s reduction in delivery, and (3) the intertie capacity has been fully utilized, the ISO would be unable to allow the intermittent resource to return to its 100 MW schedule.

The concepts of dispatching economic bids of separate, dispatchable dynamic transfers to maximize transmission utilization can be understood through the framework for determining available transfer capabilities of interconnected transmission networks for a commercially viable electricity market, that is stated in NERC’s “Available Transfer Capability Definitions and Determination” report.<sup>19</sup> NERC distinguishes among reserved versus scheduled, and recallable versus non-recallable, uses of transmission as shown in the following diagram.

**TTC, ATC, and Related Terms in the Transmission Service Reservation System**



Using the concepts of the NERC framework, the day-ahead market and hour-ahead scheduling process are within the planning horizon, when intertie capacity is reserved but dynamic resources are not yet scheduled. Recallability is defined in the NERC report as the right of a transmission provider to interrupt all or part of a transmission service for any reason, including economic, that is consistent with FERC policy and the transmission provider’s transmission service tariff or contract provisions. In the above diagram, in the operating horizon “recallable

<sup>19</sup> NERC’s “Available Transfer Capability Definitions and Determination” report is available at <http://www.nerc.com/docs/docs/pubs/atcfinal.pdf>

scheduled" transmission uses a portion of "non-recallable reserved" transmission when the "non-recallable scheduled" transmission is less than the "non-recallable reserved" transmission. The NERC report explains that the combination of "non-recallable reserved" and "recallable reserved" can exceed the total transfer capability, to more fully utilize transmission assets, subject to constraints and priorities including:

- The sum of "non-recallable scheduled" plus "recallable scheduled" transmission cannot exceed the total transfer capability,
- "Non-recallable reserved" itself cannot exceed the total transfer capability,
- Non-recallable service has priority over recallable service, and
- Reserved transfer capability may be used by recallable scheduled transfers.

In terms of the ISO's markets, awarded self-schedules can be considered "non-recallable scheduled" transmission, while dispatches of economic bids above self-schedules can be considered "recallable scheduled" transmission since they can be rescinded based on economics. "Non-recallable reserved" transmission is the maximum reservation, which will be subject to the intertie scheduling constraint in the day-ahead and HASP market runs, and then go in the transmission profile of e-Tags to the extent it is awarded. When the ISO issues a dispatch for an interval in the real-time market, the dispatch represents "recallable scheduled" transmission, for which the ISO has reserved "recallable reserved" transmission for that real-time dispatch interval. This framework supports the dispatch of dynamic transfers that have submitted economic bids, to make use of transmission that is within the e-Tag transmission profiles of intermittent resources but that is not used in that five-minute dispatch interval.

Based on the mechanisms described above, the series of steps for congestion management affecting dynamic transfers is as follows:

- In the ISO's markets, congestion is managed first by dispatches of economic bids. Over the time horizon during which the ISO economically dispatches resources' bids, the ISO will be able to use the available forecasts of intermittent resources' availability to award "recallable scheduled" transmission and "recallable reserved" transmission (maximum reservation, in the terms used above), within the available capacity.
- When economic bids that are effective in relieving congestion on transmission constraints are exhausted (i.e., fully dispatched for the next dispatch interval), the ISO's market software will adjust self-schedules of dispatchable resources to further manage congestion.
- In the event that real-time flows exceed transmission limits, time is more limited, and the ISO may need to (1) instruct resources whose outputs exceed their maximum transmission reservation to return to their schedules and dispatch points, and then (2) use economic bids that are available to the ISO's operators to manage congestion more quickly than the market software would normally resolve, before (3) initiating pro rata curtailments of self-schedules that are the most effective at relieving the real-time congestion.<sup>20</sup>

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<sup>20</sup> An issue in the ISO's market software has been obtaining pro rata adjustments of equally situated resources' self-schedules. For the day-ahead market, there is much similarity between the schedules of dynamic and static resources, and the ISO is working to ensure equitable schedule adjustments. In the real-time market, dynamic and static resources are less similar due to scheduling of static resources at fixed amounts during operating hours (except for inter-hour ramping), while dynamic

This sequence reflects that, first, the schedules and dispatch points represent reserved transmission, and second, that economic dispatches represent recallable transmission with lower priority than self-schedules, which represent non-recallable transmission.

### 3.3. Dispatchability requirements and curtailment rules

In most instances, the market prices resulting from the ISO's congestion management may be adequate to ensure compliance with dispatches. When the ISO's market software determines schedules, it considers known transmission constraints, but sometimes conditions change after the market runs and changes to schedules must occur in order to maintain reliable operations. In the event of a real time derate on the designated intertie or other transmission contingency event in close proximity, it is imperative that the dynamic resource, either conventional resource or intermittent, be "dispatchable" so as to be able to respond immediately to the dynamic interchange schedule (e-Tag) curtailment.<sup>21</sup> Experience with the existing dynamic schedules has shown that critical real-time operational issues can arise very quickly, and that rapid response is required to maintain reliability, but the response by some market participants has not always occurred as needed. If a market participant causes the ISO to incur a penalty for non-compliance with standards, existing tariff provisions allow the ISO to charge the market participant for the penalty, but these provisions only cover fairly extreme departures from reliable operation and may not be sufficient.

A key issue with the expansion of dynamic import services to renewable resources will be the ability of the resource to be "dispatchable" and to drop load in defined increments, to be immediately responsive to curtailment orders by the native or attaining BA. In addition to tariff provisions, this ability may require the use of special operating procedures that would be developed to reflect individual resources' individual characteristics, equipment that facilitates immediate response to such dispatch instructions, and the decisive reduction of output in pre-defined blocks of MWs. This agreement and unit ability will be particularly critical in the event of an overload condition at the associated pre-existing physical Intertie for grid reliability and NERC Interchange Standard compliance.

The market software currently has some provisions for performing contingency dispatch to respond to events including outages or unexpected derates of interties, although at times manual intervention by operators is necessary to reduce energy flows. Manual intervention may also be necessary if dynamic resources do not respond to dispatches, even if derates are foreseeable or allow response times that would otherwise accommodate normal ramping. Dynamic scheduling allows the ISO to respond to changing congestion conditions within operating hours more than its very limited ability to adjust static hourly intertie schedules, and the Dynamic Scheduling Agreement for Scheduling Coordinators requires compliance with the ISO's dispatches.<sup>22</sup> In addition, inadequate compliance with dispatches can result in issuing

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resources are dispatched using five-minute intervals, and further analysis will be needed before the ISO can commit to pro rata adjustments of self-schedules.

<sup>21</sup> E-Tagging of dynamic transfers is necessary for compliance with scheduling standards. The ISO is refining our administration of e-Tags for pseudo-ties within the market systems, based on our experience with the pseudo-tie pilots.

<sup>22</sup> Although the ISO will be modifying the terms of Section 5.1 of the Dynamic Scheduling Agreement for Scheduling Coordinators, which currently states a tolerance band for uninstructed deviations, sections 4.1 and 5.2 of the agreement are general requirements for compliance with the ISO tariff. Also, Section 8.3 of the Dynamic Scheduling Protocol (ISO Tariff Appendix X) states: "All Day-Ahead Market and HASP/RTM submitted Dynamic Schedules shall be subject to CAISO Congestion Management and as such may not exceed their transmission reservations in Real-Time (with the

operating orders (as defined in tariff section 37.2.1.1) to dynamic resources, to reduce flows to within operating limits. The ISO will determine how it can most efficiently distinguish operating orders from routine dispatches, and communicate operating orders to the affected resources. One potential mechanism for communicating operating orders may be by using a comment field in communications that would be distributed through the Automated Dispatch System (ADS).

Recognizing these concerns, the Straw Proposal noted the existence in the current ISO tariff of Section 5.1 of the pro forma Dynamic Scheduling Agreement for Scheduling Coordinators (Appendix B.5 of the ISO tariff), which provides that except for operating emergency situations, real-time energy transfers may not vary from the day-ahead schedule as adjusted by any dispatch instructions by more than the greater of five MW or three percent of the net dependable capacity (PMax) of the system resource, integrated across a ten-minute interval. If such defined performance band is exceeded by any amount in more than five percent of the ten-minute intervals on three successive days, then such deviations constitute one event of non-compliance with the Dynamic Scheduling Protocol. Section 3.2.2 of the Dynamic Scheduling Agreement allows the ISO to terminate the agreement after three instances of non-compliance with the Dynamic Scheduling Protocol (ISO tariff Appendix X).

The ISO proposed the scheduling option discussed in section 3.2 with the initial intent of allowing intermittent resources to manage their schedules within this tolerance band. This option would allow an intermittent resource to update its availability every five minutes within the operating hour, by reporting its expected delivery to the ISO by 5-minute time intervals for a forward-looking 2 hour period, which the ISO would return to the resource as the ISO's dispatch unless it is limited by congestion or other conditions. There does not appear to be any alternative that could allow more accurate updates for the ISO's dispatch, given that the ISO's real-time dispatch interval is five minutes in duration.

Nevertheless, discussion at the March 17, 2010, stakeholder meeting concerning the Straw Proposal questioned whether the existing tolerance band is achievable, even with the proposed ability to update the ISO dispatch level. To analyze whether the tolerance band that now exists in the ISO tariff is appropriate, the ISO subsequently analyzed the performance for the 2009 calendar year of the ten then-existing dynamic transfers (nine dynamic schedules plus one pseudo-tie import) and of existing intermittent generators within the ISO. The purpose of this analysis is to determine whether the ISO should consider changes to the existing tolerance band and/or to the provisions concerning non-compliance, given that the ISO has operated successfully with these resources in operation.

In the analysis of existing intermittent resources, the ISO was not able to use five-minute updates of forecasted output because the ISO had not forecasted at that granularity. During discussion at the March 17 stakeholder meeting, some participants suggested that they would not be able to forecast more accurately than to assume that current output would be the expected output during the subsequent interval. Therefore, this analysis assumes that for the forecasted output that would be sent during one five-minute interval would use the average output during the previous five minutes as the forecast for the following five minutes, and that this method would be performed regularly during each five-minute update during the year. The analysis then averaged the difference between the "forecasted" and actual delivery across ten-minute intervals, as currently stated in the tariff. The following graph shows the number of 10-

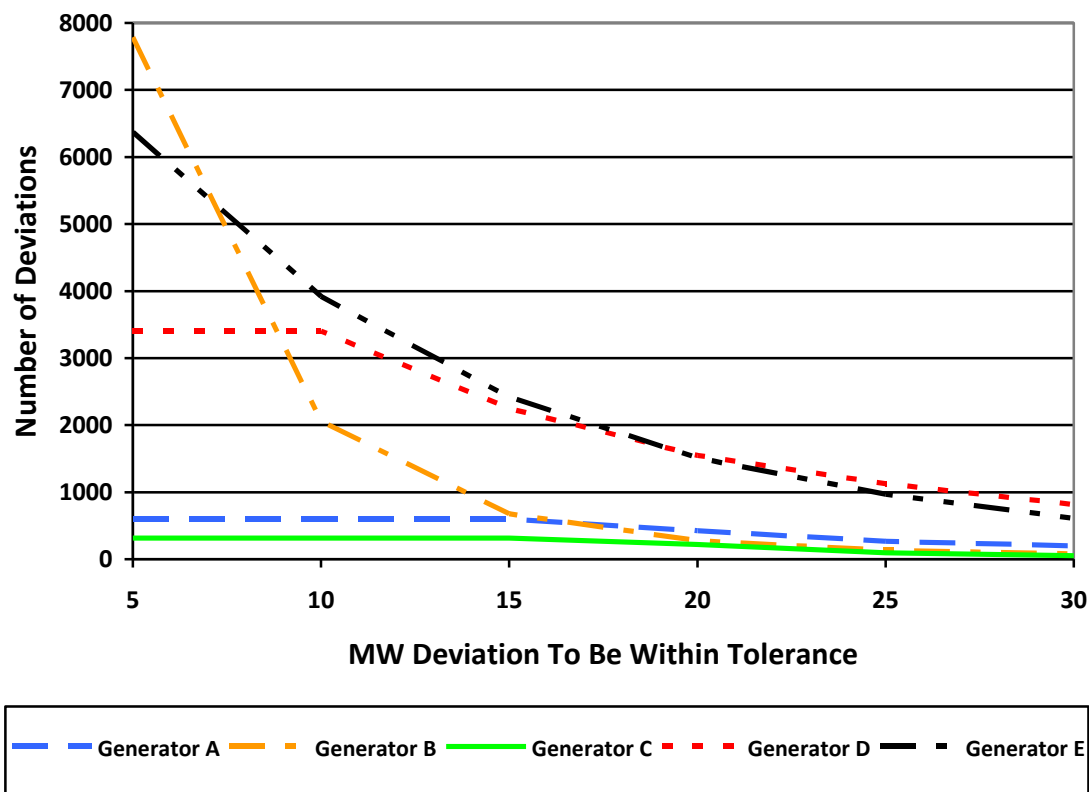
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exception of intra-hour Dispatch Instructions of the Energy associated with accepted Ancillary Services Bids)." The ISO will determine the disposition of the current language in section 5.1 while developing the tariff amendment to implement the Board of Governors' upcoming Dynamic Transfers decision, but section 5.1's content may be limited to its existing reference to the ISO tariff's overall provisions for uninstructed deviations.



minute intervals during the year in which this difference exceeds the tolerance band, out of the 52,560 ten-minute intervals during the year (8760 hours times six intervals per hour), versus the MW of deviation that defines the tolerance band (the current tariff definition being 5 MW), for five intermittent resources (wind and solar). (The comparison for intermittent resources is relative to the MW part of the threshold definition because most existing intermittent resources are less than 300 to 400 MW, so the MW part of the definition generally exceeds the percentage part of the definition. The five intermittent resources shown here are among the larger ones, although they are not necessarily the largest five resources because variability of weather at the generator's site can cause as much MW variability as simply being the largest resource.)

### Intermittent Resources: Deviations Outside Tolerance Band

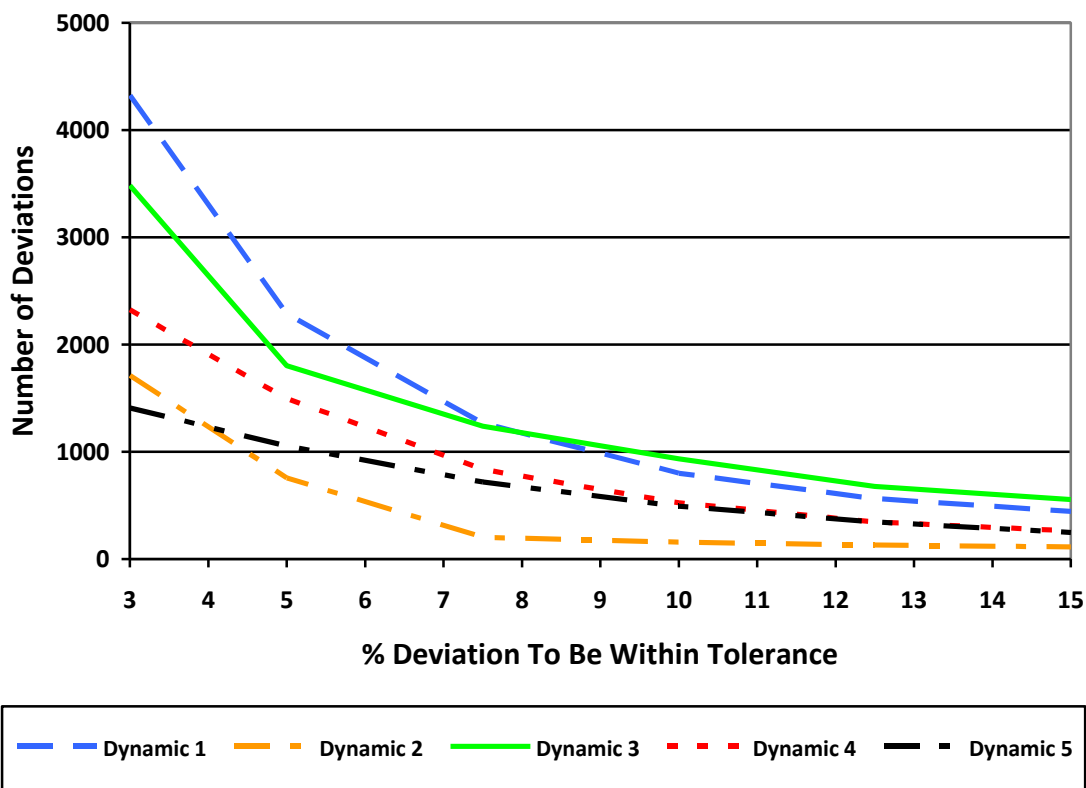


Note that it is not necessary to be within the tolerance band in all intervals to meet the existing tariff requirement, which counts the number of intervals with deviations outside the tolerance band during three-day periods. However, an examination of the events of non-compliance using the assumptions of this analysis, it would appear to be necessary to widen the tolerance band's percentage to at least 25 MW to avoid termination of dynamic scheduling agreements with intermittent resources similar to generation within the ISO.

For existing dynamic transfers, the ISO determined the difference between delivered output and the real-time dispatch point, as adjusted for regulation energy, by 10-minute interval. The following graph shows the number of 10-minute intervals during the year in which this difference exceeds the tolerance band, versus the percentage of deviation that defines the tolerance band (the current tariff definition being 3% of PMax), for five of the ten existing transfers. (The comparison for existing dynamic transfers is relative to the percentage of PMax because most

existing dynamic transfers are at least 300 to 400 MW, so the percentage part of the threshold definition exceeds the MW part of the definition.)

### Existing Dynamic Transfers: Deviations Outside Tolerance Band



As noted above, it is not necessary to be within the tolerance band in all intervals, but it is more difficult to meaningfully show the number of events of non-compliance as defined by the tariff. However, an examination of the events of non-compliance, after accounting for instances of reported outages and derates (including not counting reasonable extensions of time near the reported outages and derates as events of non-compliance), suggests that it would be appropriate to widen the tolerance band's percentage to at least 10% of PMax to reduce the exposure to potential termination for parties to dynamic scheduling agreements in the future.

In summary, if the ISO were to retain the tolerance band approach to measuring compliance, and attempt to make it workable under the existing tariff approach of exposure to potential contract termination after three events of "non-compliance," it appears that it would be appropriate to widen the tolerance band to at least the greater of 25 MW or 10% of PMax. Expecting new dynamic transfers to be able to routinely perform within this level of tolerance may be appropriate as a criterion for acceptance of new resources, but this would not be adequate performance for reliability purposes at times when the ISO experiences real-time congestion on its interties and resources' deliveries exceed their schedules. When there is no congestion, uninstructed deviations by dynamically transferred resources would be no more of a concern than they are for resources within the ISO. A more appropriate criterion for continued operation of a dynamic transfer agreement would be compliance with operating orders, including the existing provisions of section 37.2 of the ISO tariff ("Comply with Operating

Orders”). The term “operating order” in section 37.2 can be presumed to be different from a routine dispatch instruction, and to be more focused on conditions when reliability requires a specific response to the ISO operator’s instructions. Section 37.2.1.1 of the ISO tariff states a definition of the term “operating order”: “For purposes of enforcement under this Section 37.2, an operating order shall be an order(s) from the CAISO directing a Market Participant to undertake a single, clearly specified action (e.g., the operation of a specific device, or change in status of a particular Generating Unit) that is feasible and intended to resolve a specific operating condition.”

The following examples illustrate the relative roles of dispatches and operating orders, in terms of the order of actions stated in Section 3.2 of this Final Proposal that may be taken in the event that real-time flows exceed transmission limits, with limited time available for response.<sup>23</sup> Normally, the ISO’s real-time market software will have dispatched economic bids to account for transmission constraints, including anticipated changes in constraints, and forecasts of intermittent resources’ output. To manage operating constraints when time does not allow control using only dispatches of economic bids, the ISO would first instruct resources whose outputs exceed their maximum transmission reservation to return to their schedules and dispatch points, and then use any remaining economic bids to manage congestion, before initiating pro rata curtailments of self-schedules that are the most effective at relieving the real-time congestion.

- First, assume that the available transfer capability (ATC) is 1000 MW, and the market schedules resulting from HASP include 600 MW of static hourly firm schedules. (All scenarios in these examples assume the 1000 MW of ATC and 600 MW of static schedules.) In addition, dynamic schedules with expected average energy of 300 MW and maximum transmission reservation of 300 MW. In actual real-time operations, the dynamic resources deviate by +10 MW. There is no required ISO curtailment action in this first scenario because the 910 MW of actual flow does not exceed the 1000 MW flow limit.
- In a second scenario, the dynamic schedules have an expected average energy of 400 MW and maximum transmission reservation of 400 MW. If the dynamic schedules deviate by +10 MW in actual real-time operations, the actual flow becomes 1010 MW, which exceeds the flow limit of 1000 MW. The ISO would have the right to issue an operating order for the dynamic schedules to return to the 400 MW of transmission reservation. If further mitigation were needed, the ISO would dispatch economic bids, if effective bids were available from dynamic transfers or resources within the ISO BAA.
- In a third scenario, the dynamic schedules’ maximum transmission reservation is 400 MW, but the dynamic schedules have an expected average energy of only 300 MW. In actual real-time operations, the dynamic schedules deviate by +110 MW above the scheduled energy, producing an actual flow of 1010 MW (exceeding the flow limit of 1000 MW). The ISO would be able to first use operating orders for the dynamic schedules to curtail by 10

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<sup>23</sup> When adequate time is available for response, changes in transmission constraints’ capacity or in intermittent resources’ output would be accounted for through the ISO’s normal economic dispatch, assuming that dispatchable resources comply with dispatch instructions. The real-time market software includes unit commitment with a forecast period of nearly five hours, and known changes in transmission capacity would be considered in unit commitment and dispatch. Similarly, observed changes in intermittent resources’ outputs and forecasts of output in future dispatch intervals would be considered in the real-time market’s normal functions. The scenarios illustrated here apply to more immediate needs for response, as well as to instances when the ISO has dispatched resources to maintain their outputs at certain levels but the resources have not complied.

MW, to produce a return to their transmission reservation of 400 MW. If further mitigation were needed, the ISO would dispatch economic bids, if bids were available.

- In a fourth scenario, both the average energy and maximum transmission reservation of the dynamic schedules' are 300 MW. In actual real-time operations, the dynamic schedules do not deviate above their scheduled energy, but unscheduled flow from other sources produces an actual flow of 1010 MW. In this scenario, the ISO will not issue an operating order to curtail the dynamic schedules as the first response, because they are within their transmission reservations. To restore the actual flow to the flow limit, the ISO would dispatch economic bids as the first curtailment action. If economic bids were not available or were not sufficient to return the flow to the flow limit, the ISO would order pro rata curtailments across all schedules using the affected inertia to obtain the needed 10 MW flow reduction, as operating orders.
- A fifth scenario is similar to the third, with the addition of unscheduled flow as in the fourth scenario: the dynamic schedules' maximum transmission reservation is 400 MW, but the dynamic schedules have an expected average energy of only 300 MW. In actual real-time operations, the dynamic schedules deviate by +110 MW above the scheduled energy, which, in combination with uninstructed flows, producing an actual flow of 1100 MW. The ISO would have the right to initially issue operating orders to the dynamic schedules to curtail by 10 MW, to produce a return to their transmission reservation of 400 MW. To accomplish the remaining 100 MW of flow reduction, the ISO would dispatch economic bids, if bids were available, before issuing operating orders for pro rata reductions.

Tariff section 37.2 provides financial penalties for non-compliance with operating orders issued by the ISO (\$5,000 for the first instance, and \$10,000 for subsequent instances), but ironically does not appear to provide contract termination as a result of non-compliance. Based on the analysis presented above, the ISO now proposes to eliminate contract termination as a penalty resulting from section 5.1 of the Dynamic Scheduling Agreement for Scheduling Coordinators. Instead, upon a third instance of non-compliance with an operating order, the ISO proposes to require the resource owner to install additional equipment or institute other measures to ensure compliance, potentially including direct equipment control, and consider contract suspension if these measures do not secure the necessary compliance.<sup>24</sup> The ISO will also determine how it can most efficiently distinguish operating orders from routine dispatches, and communicate operating orders to the affected resources, such as a distinguishing indicator in communications that would be distributed through the ISO's Automated Dispatch System (ADS).

In addition to being able to demonstrate response to operating orders, intermittent resources that use dynamic transfer should also satisfy requirements that the ISO Board of Governors approved on May 18, 2010, to apply to variable energy generators to the extent that they have been approved by FERC.<sup>25</sup> The applicable requirements focus in particular on resource

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<sup>24</sup> Section 3.2.1 of the Dynamic Scheduling Agreement for Scheduling Coordinators states other grounds for contract termination, while section 3.2.2 addresses non-compliance provisions such as the tolerance band in section 5.1. A stakeholder comment that addressed the context of sections 3.2.2 and 5.1 suggests that contract suspension is more appropriate than contract termination. If the resource operator does not implement the necessary actions to ensure future compliance, the ISO will release any capacity assigned to the resource in queues that may exist for inertia capacity.

<sup>25</sup> These requirements are stated in the ISO management's recommendation to the Board, which is available at <http://www.aiso.com/2793/2793abee1a0a8.pdf>. The term "variable energy generators" should be considered synonymous with Eligible Intermittent Resource for purposes of this Final Proposal.

operators' ability to communicate with the ISO and respond to the ISO's dispatch instructions, including:

1. Variable energy generators must have the ability to limit their active power output in response to a dispatch instruction or operating order from the ISO. This ability should apply to the resource's full range of potential output so that the resource's reduction in output can range from incremental to full curtailment.
2. The variable energy generator is expected to interface with the ISO in a manner similar to any other generating facility. As such, the resource must be able to receive and respond to automated dispatch system instructions and any other form of communication authorized by the tariff and in conformance with the time periods prescribed by the tariff.

### **3.4. Locational pricing**

Although most of the ISO's dynamically scheduled resources began operation prior to April 2009, as of April 2009 the ISO's market models generation within the ISO at its physical location in the transmission network, and prices generation output at the point where it is metered. Similarly, the ISO includes significant transmission facilities outside the ISO BAA in its full network model to the extent that is practicable, and models and prices pseudo-tie generation at its actual location in the full network model. For dynamic resource-specific system resources, the ISO's dynamic scheduling agreements establish the actual location of the generation, and the ISO will model and price dynamic resource-specific system resources at these locations.<sup>26</sup>

Modeling dynamic resource-specific system resources at their actual locations allows the ISO to establish feasible interchange schedules and thereby maintain the reliable operation of the ISO's transmission system, by modeling the resulting flows as accurately as possible. A lack of modeling resources at their actual locations, when their locations are known, could cause consumers to pay inappropriate costs resulting from inaccurate real time re-dispatch costs, as the ISO would need to mitigate congestion that results from using inaccurate modeling. After establishing the scheduling and dispatch of dynamic resource-specific system resources based on their actual locations, it is then necessary to use the corresponding locational marginal prices (LMPs) to avoid disparities between the prices that are used for scheduling and dispatch and the prices that are paid in financial settlements.

An important attribute of the locational marginal prices (LMPs) that the ISO uses to schedule, dispatch, and settle resources at these locations outside the ISO is that they reflect only costs that occur within the ISO market. The calculation of the ISO's LMPs is described in detail in Section 27.1 and Appendix C of the ISO tariff, and is an established practice in the ISO's markets. The ISO enforces congestion only for transmission constraints that are within the ISO's BAA and scheduling capacity rights that are available as ISO controlled grid outside the ISO BAA, and the ISO excludes losses on transmission facilities that are outside the ISO BAA. Transmission constraints that are within an external BAA are enforced and priced under the terms of the external BA's tariff, and are not enforced or priced in the ISO's markets. Similarly, losses between resource locations and the ISO boundary are calculated and settled under the terms of the external BA's tariff, or under its transmission contracts, and are not included in the ISO's LMPs. In some cases, the external BA's charges for losses are settled by the external BA charging the ISO, which in turn passes these charges on to the scheduling coordinators whose

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<sup>26</sup> This is not a significant change for existing dynamic resource-specific system resources, because they schedule into the ISO markets at scheduling points that are close to their physical locations.

schedules have used the affected transmission, but this existing practice does not affect the ISO's LMPs and is not changed by this proposal.

Information for modeling dynamic resource-specific system resources consists of data concerning both the dynamically transferred resource and the transmission system that supports it. For a generation resource, most of the required data would be obtained from the resource operator and/or scheduling coordinator, for implementation of the Dynamic Scheduling Agreement for Scheduling Coordinators (Appendix B.5 of the ISO tariff), Pseudo Participating Generator Agreement (which will be added to the tariff), or similar agreement. The ISO currently bases its modeling of external transmission systems on base cases that are available on the WECC website. If (1) a BA acts only in the role of a transmission operator and is not involved in the scheduling of a dynamic transfer, and (2) the WECC base cases contain adequate representations of the transmission systems that support delivery of the resource to the ISO boundary, at the level of detail that would normally be contained in a WECC base case, the ISO does not anticipate needing additional information about the transmission system. In most cases, the host BA for the dynamically transferred resource and any intermediary BAs will need process e-Tags and to receive data concerning the dynamic resource, such as telemetry, which it may need to relay to the ISO. These requirements are described in the Dynamic Scheduling Host Balancing Authority Operating Agreement (Appendix B.9 of the ISO tariff) or similar agreement.

### **3.5. Pro rata allocation of deviations among BAAs**

Prior to 2007, the ISO assumed real-time balancing service for some dynamic resources that scheduled less than 100% of the resource output into the ISO, as the dynamic transfer equaled the actual plant output minus static schedules. For example, if an external resource was actually generating 490 MW in real-time but had a dynamic import schedule of 100 MW to the ISO and a static schedule of 400 MW with another BAA, the actual dynamic transfer into the ISO would have been 90 MW (490 – 400), which meant that the ISO assumed the entire 10 MW of deviation.

Recognizing that this methodology could result in excessive costs to the ISO's market participants, the ISO has subsequently incorporated pro rata allocation of deviations into agreements for individual dynamic schedules, producing a sharing of the real-time balancing burden from an external resource that is dynamically scheduled to the ISO (proportionate to the percentage of the resource that sinks to the ISO dynamically). Example: assuming an external resource is actually generating 490 MW in real-time but has a dynamic schedule of 100 MW import to the ISO and a static schedule of 400 MW with another BAA. The ISO would incur 2 MW of the 10 MW deviation ( $100/500 * 10$ ). The native BAA maintains responsibility for the other 8 MW of deviation burden.

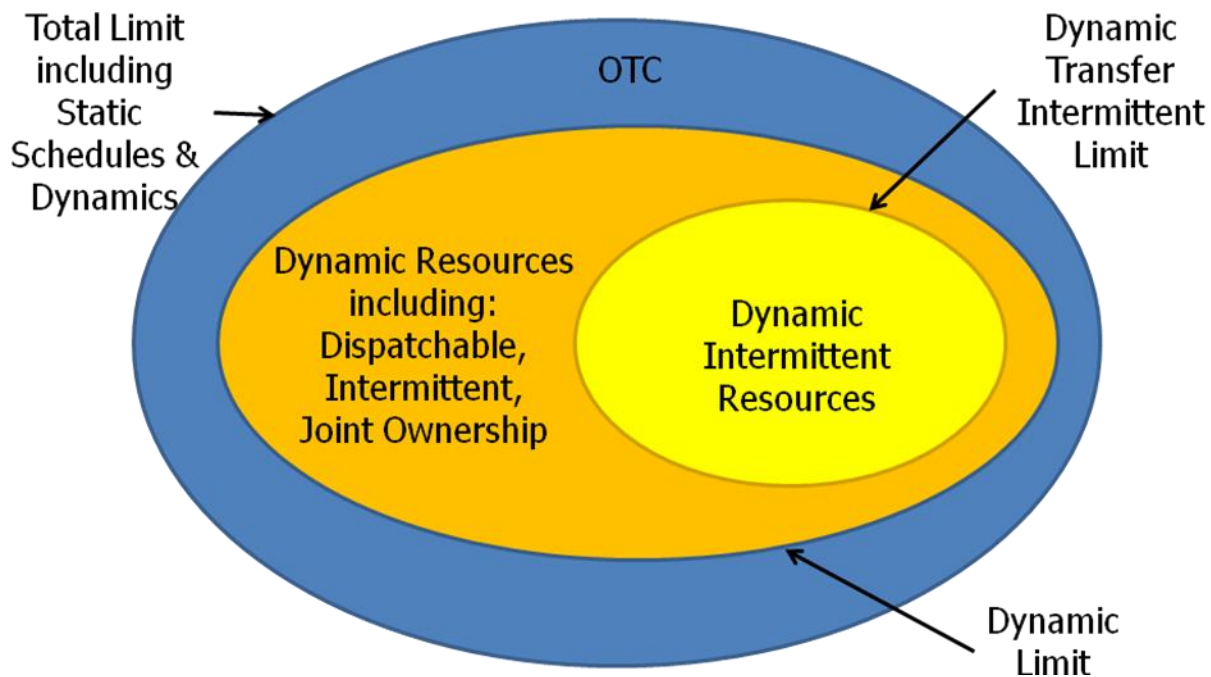
Stakeholder comments support the ability of dynamically scheduled resources to schedule only a portion of their output into the ISO's markets. The ISO will incorporate this treatment in its tariff as an upper limit on its allocation of deviations, rather than needing to use a contract-by-contract provision. The implementation of the pro rata allocation of deviations among BAAs may include tariff provisions that the ISO will not execute new Dynamic Scheduling Agreements for resources in BAAs that do not provide this limit to the ISO's exposure to deviations.

### **3.6. Limits of dynamic imports**

Section 5.1 of the Dynamic Scheduling Protocol (Appendix X of the ISO tariff) establishes the right for the ISO to establish limits applicable to the amount of any ancillary services and/or

energy imported into the ISO BAA, whether delivered dynamically or statically. The following figure illustrates the applicability of the limits addressed in this section: within the total operating transfer capability (OTC) of an intertie, in theory there could be a limit on overall dynamic transfers including both conventional and intermittent resources, and within that, there could be a limit on dynamic transfers of intermittent resources. The innermost part of this diagram is the subject of technical studies that the ISO has performed during the course of this stakeholder process, through a contract with GE Energy.

### Illustration of Dynamic Transfer Limit as Part of Overall OTC



During the course of its study, the ISO has coordinated with other affected BAAs within the WECC area (Western Interconnection) concerning the potential for maximum transfer limits between BAAs, including one-to-one discussions with other balancing authorities, presentations to WECC's Seams Issues Subcommittee and Variable Generation Subcommittee, and participation in the Dynamic Transfer Capability Task Force in the Pacific Northwest.<sup>27</sup> The ISO has also discussed the details and results of these studies with its market participants through publication of reports and conference calls, from August to December 2010.

The ISO's studies have addressed the potential for operational impacts and limitations on control, stability and response of the transmission system. The studies to support the dynamic transfer policy are not general studies of limitations related to intermittent resources in general, but need to evaluate the effects that the level of variability of dynamic transfers has on operational reliability. In other words, the studies are specific to dynamic transfer limits and not

<sup>27</sup> For example, Bonneville Power Administration has conducted a study whose results are available at [http://www.transmission.bpa.gov/wind/dynamic\\_transfer/default.cfm](http://www.transmission.bpa.gov/wind/dynamic_transfer/default.cfm)

replace, but rather be informed by, general studies addressing the system needs to accommodate all intermittent resources.

The ISO studied whether there are any limitations as a result of supporting dynamic transfer of variable resources located outside of the ISO BAA while shaping and firming energy to support the variable delivery with resources within the ISO BAA, to answer the following technical questions:

- a. Do variable dynamic transfers pose any impacts to existing path limits that are established based on static interchange models with an accommodation of planned hourly variation ramped over a 20 minute period?
- b. Do variable dynamic transfers create any voltage control issues?
- c. Does the level and nature of variability and dynamic transfers of variable resources pose any risk to stability or excitation of low frequency modes of oscillation? In order to answer this question, the ISO may have to gather more granular actual output data from some technology types.

The ISO published GE Energy's Final Report on Impact of Dynamic Schedules on Interfaces on January 6, 2011 (available at <http://www.caiso.com/2aff/2aff9e9150530.pdf>). The conclusion is that the frequency and magnitude of voltage variations due to intermittent dynamic transfers are expected to be within the normal capability of the transmission system, system stability is maintained, and therefore no limits need to be applied within the ISO's BAA at this time. (The ISO's study has not examined whether limitations exist in other BAAs, which may determine that such limitations exist within their systems.) As part of the ISO's overall operational response to increasing levels of generation by intermittent resources, the ISO will monitor any operational issues that relate to dynamic transfers, and continue to coordinate with other affected BAAs to study regional issues affecting dynamic transfer capability. If such limitations become apparent in the future, the ISO will identify appropriate responses, including potentially limiting new dynamic transfers of intermittent resources, but would not limit dynamic transfers that would have already been established

### **3.7. Management of requests for dynamic transfers**

Due to the possibility that the studies discussed above may have established limits on dynamic imports of intermittent resources, the ISO discussed a series of alternatives for management of requests for dynamic transfers. Even when dynamic transfers of intermittent resources are not limited to less than the maximum inertia capacity, the ISO must decide how to allocate the available capacity for supporting dynamic transfers. This can be done by limiting the amount of dynamic transfer schedules accepted by the ISO markets in any given hour (the "congestion management approach"), by limiting the amount of supply capacity that is approved via dynamic transfer agreements to utilize the available dynamic transfer capacity (the "administrative approach", involving queuing or other procedures), or a combination of both approaches. The evolution of proposals in this area was documented in the Supplement to the Draft Final Proposal, Second Supplement to the Draft Final Proposal, and Revised Draft Final Proposal, and in a Market Surveillance Committee opinion, which are available at <http://www.caiso.com/2476/24768d0a2efd0.html>.



As noted above, the conclusion of the ISO's study of intermittent dynamic transfer capability is that no limits need to be applied within the ISO's BAA at this time.<sup>28</sup> Thus, there would be little need for a separate process for management of requests for intermittent dynamic transfers, beyond processes that would otherwise apply to enrollment of conventional dynamic transfers. Like conventional dynamic transfers, intermittent dynamic transfers will be subject to the same congestion management processes that otherwise apply during operation of the ISO's markets. In previous documents and stakeholder meetings discussing the alternative enrollment management approaches, the ISO recognized that the congestion management approach has risks to market participants about whether newly developed resources will be deliverable to the ISO market, and whether they will be able to market energy that does not clear the ISO's congestion management process. Thus, to allow market participants who are developing or contracting for new dynamically transferred resources to self-manage risks that their projects, combined with existing dynamic transfers, do not exceed the dynamic available transfer capability, the ISO will determine procedures for sharing data regarding dynamic transfer agreements that have been registered and/or are operational at specific interties.

### **3.8. Aggregation of conventional and/or renewable resources**

Some external intermittent resources are contemplating aggregating resources to take advantage of geographic diversity in order to reduce real-time deviations. In some cases a conventional resource could be aggregated with an intermittent resource. Advantages of aggregation include the ability of the dynamically transferred resources to combine resources together in a way that lessens the overall ISO regulation and load following burden. For example, if an intermittent resource wants to aggregate with a gas-fired generator, it would schedule the units as a package to use its dispatchable generator to "firm" or shape the intermittent resource's output. Scheduling these resources together obviates the need for the ISO to dispatch resources within our BAA to regulate or shape that dynamic transfer. Calpine's comments on the Issue Paper suggest a more elaborate approach, involving a "virtual control area" where several resources could be aggregated together into a pseudo-BAA and then scheduled into the ISO as a single resource. The ISO supports aggregation as a concept but sees limitations if sites were aggregated that are not "electrically close" to each other, since the impact on the ISO and LMPs at the scheduling points would vary among the resources' actual locations. Market initiatives that are developing elsewhere in WECC may affect the effectiveness of aggregation, which may create regional congestion management on more than the current Qualified Paths of the WECC Unscheduled Flow Mitigation Procedure and a regional energy imbalance energy market.

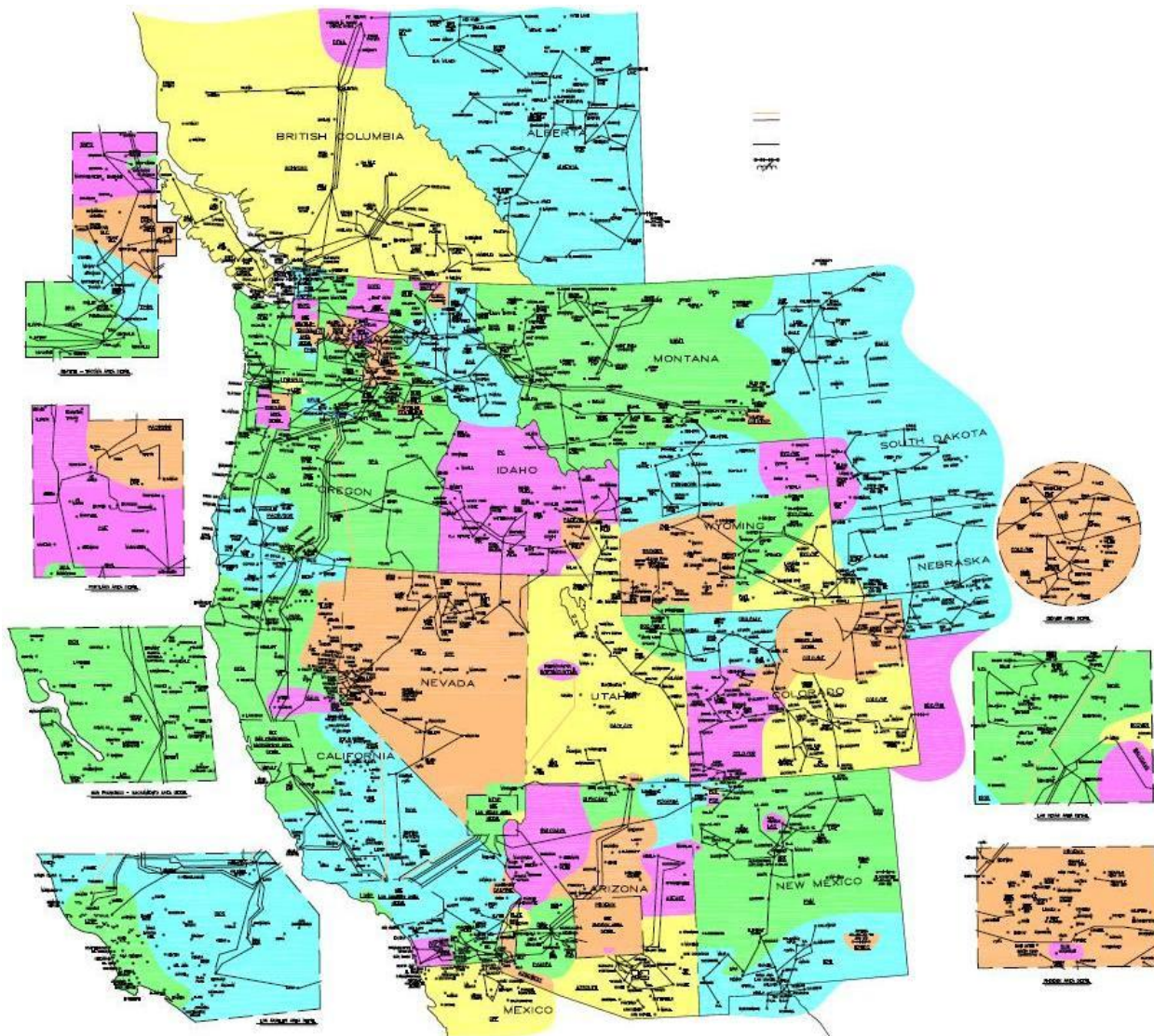
The ISO can support aggregation of resource sites that are electrically close together, subject to agreement by both the native BAA and attaining BAA, to provide certainty that aggregations will not conflict with other policies that are still being developed. Criteria for being "electrically close" are likely to vary between the perspectives of the ISO and the balancing authority in whose area aggregated resources are located, and both the native balancing authority and attaining balancing authority have legitimate interests in defining acceptable resource aggregations. To provide clarity in what the ISO would require, the ISO notes that the WECC's current Unscheduled Flow Mitigation Plan (UFMP) uses an identification of a number of unscheduled

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<sup>28</sup> While the ISO study did not identify any need for limit of intermittent dynamic resources on COI or West of River based on condition internal to the ISO, other balancing authorities may limit the quantity of dynamic transfers on an intertie based on conditions in their area.

flow (USF) zones within the WECC region, in which resources have very similar impact on the qualified paths that are managed through the UFMP. The qualified paths include the California-Oregon Intertie (COI) (Path 66), for which the ISO is the path operator, as well as interfaces in the Southwest such as Path 22, Four Corners-Central Arizona, and Path 23, Four Corners 345/500-kV Transformer. These zones are shown in the following map, which is available at <http://www.wecc.biz/committees/StandingCommittees/OC/UFAS/Shared%20Documents/USF%20Zone%20Map.pdf>. These zones define areas within which generators would have sufficiently similar impacts on the ISO to serve as boundaries of acceptable resource aggregations, from the ISO's perspective. In addition, the ISO notes that a variety of functions that balancing authorities must perform to support dynamic transfers, such as exchange of telemetry on four-second intervals, would be difficult to perform if a resource aggregation were to span multiple balancing authorities.

### WECC Unscheduled Flow Zones



As noted above, the acceptability of a resource aggregation needs to be determined by both the native balancing authority and the attaining balancing authority. Since a dynamic import to the ISO is a dynamic export for the native balancing authority, the determination of aggregation qualifications will partly fall on the native balancing authority where the resources are interconnected to the grid. The native balancing authority must determine the “electrical closeness” of a potential aggregation based upon the impact to the source balancing authority’s system. In cases where the ISO would be the native balancing authority rather than the attaining balancing authority, the ISO would generally require that resources be at the same substation and voltage level to approve an aggregation for dynamic export. The ISO assumes native balancing authorities may establish similar requirements for dynamic transfers to the ISO.

### **3.9. Generator-only balancing authority areas**

Among the requests for dynamic transfers into the ISO are ones from single generator balancing authority areas. Currently, single generators providing their own reserves and service are tagged and denoted as “unit-contingent” resources and transactions, which is a type of standard transaction that is recognized by the Western Systems Power Pool (WSPP). As discussed in the Straw Proposal, the challenges of dynamic transfers from these BAAs include (1) increased potential for increased requirements for the ISO to firm, shape and load follow for a single resource, particularly an intermittent resource, (2) proper accounting and compensation for inadvertent flows, (3) whether aggregation as described above offers a better solution than participation as a generator-only BAA, (4) whether NERC and WECC reliability criteria are met, and (5) impacts pertaining to intermittency. To the extent that the single generator BAA cannot self regulate, it imposes inadvertent interchange on the balance of the WECC.

The Supplement to the Straw Proposal provided further discussion about the criteria the ISO would use to evaluate dynamic transfers from generation-only BAAs. Given that a dynamic transfer requires approval of a Dynamic Scheduling Agreement, by default all dynamic transfers are approved on a case-by-case basis. For pre-existing BAAs or other resources that wish to dynamically schedule with the ISO, the ISO would be able to review their historical performance in order to be assured that the ISO can maintain reliability after entering the Dynamic Scheduling Agreement. For BAAs that would be created with the intent to use dynamic scheduling, the ISO would review the expected performance of their dynamic schedules regardless of their resource portfolios. To add clarity in this area, the ISO does not believe it is necessary to explicitly distinguish generation-only balancing authorities for unique designation. As with any resource seeking to dynamically import into the ISO, the ISO and the native balancing authority will approve the dynamic scheduling agreement in which performance terms and conditions are defined. Since generation-only balancing authorities are approved by WECC, the ISO will not duplicate WECC’s qualifications, but will validate data to support that the source balancing authority is successfully managing its inadvertent energy and providing sufficient contingency reserves, as indicators of reliable performance as a dynamic schedule.

### **3.10. Expansion of dynamic transfer based services – dynamic export schedules and pseudo-ties**

Stakeholder comments on the Issue Paper have asked the ISO to consider expanding its dynamic transfer tariff provisions to include dynamic scheduling of exports and pseudo-ties of load. In the 2003-2004 timeframe when the ISO developed and filed Amendment 59 to its tariff to formalize its current provisions for dynamic scheduling, the ISO had received informal

inquiries from market participants regarding the possible development of a formal dynamic scheduling program for exports from the ISO BAA to other BAAs. The 2004 filing of tariff amendment 59 did not establish a broader dynamic scheduling policy that would apply to exports because the short timeframe for preparing this filing required the ISO to focus on developing a comprehensive policy for imports. The ISO observed that a dynamic scheduling policy for exports would require different standards than those required for dynamically scheduled imports due to the different operational and business relationship of the ISO to resources within the ISO BAA, in contrast to imports from other BAAs. Moreover, unlike dynamically scheduled imports, the ISO had far more limited experience with the dynamic scheduling of exports, which would be instrumental in assessing potential future success of such a program. Nevertheless, the ISO offered in its filing of Amendment 59 to meet with parties who were interested in the dynamic scheduling of exports to discuss possible implementation of dynamic scheduling functionality for exports on an exploratory, pilot basis. The ISO believed that it was reasonable and prudent to consider implementing an exploratory or pilot program for dynamically scheduled exports so that the ISO could gain necessary experience that could serve as the basis for developing more formal standards for dynamic exports in the future. The ISO has followed a similar approach both in (1) implementing the standards for dynamic scheduling of imports, where the combined experience from operating pre-existing dynamic schedules and from operating three pilots filed with FERC on January 9, 2004, provided enough operational confidence that the filing of standards for dynamic scheduling of imports became possible in Amendment 59, and (2) developing and implementing pilot agreements for pseudo-tie imports of both conventional and intermittent resources before developing tariff language through the current stakeholder process.

The pseudo-tie pilot for New Melones has proved successful as an export of hydroelectric generation, as demonstrated under both the prior and the present new market designs, and has provided the operating experience that the ISO lacked in 2004. The experience with the New Melones export and Sutter import pseudo-ties has allowed the ISO to identify needs for “dispatchability” to be immediately responsive to both e-Tag curtailments on their pre-determined interties and to operational dispatch orders in the event of over-generation or a real time intertie overload condition, competition on intertie scheduling constraints, and minor refinements to the ISO master file, interchange meter data processing, interchange transaction systems, and settlements, to more efficiently manage both market bids and interchange (e-Tag) schedules in ISO systems. The identified ISO system refinements are currently being implemented in support of the present pseudo-tie pilots, including the Copper Mountain Solar pilot project, which will serve as the prototype for future pseudo-tie services. In addition, stakeholders recognize the need for and assurance that pseudo-ties and dynamic schedules compete for transmission capacity on their designated intertie with static import schedules, to assure equal access to limited intertie available transfer capability (ATC). Based on this operational experience, the ISO concludes that it can support dynamic export services for both conventional and renewable resources, as requested in stakeholder comments.

Although there will undoubtedly be differences between New Melones’ use of existing transmission contract capacity and resources that obtain transmission service through the ISO’s markets, and between pseudo ties and dynamic schedules, the Pilot Pseudo Tie Implementation Agreement for New Melones (available at <http://www.caiso.com/186a/186ad4f757710.pdf>) appears to be a useful prototype for dynamic transfer export agreements in general. One issue to be resolved when establishing agreements for dynamic exports is the allocation of uninstructed deviations between the native and attaining BAAs, for comparability with the practice that the ISO as the attaining BAA is responsible for 100% of the deviations of pseudo-tie generators but will limit its responsibility for dynamic schedules to a pro rata allocation of deviations. To ensure comparability, the ISO may require

an export that is explicitly tied to a specific intermittent generator must be a dynamic transfer. Resource-specific requirements for both intertie curtailment and dispatch instruction responsiveness will be incorporated into dynamic and pseudo-tie contracts. All dynamic transfers must adhere to the applicable WECC and NERC reliability standards for dynamic interchange, and must compete for limited transmission access on the designated intertie.

To support dynamic exports, the ISO will need to enhance its current market software. The implementation of the new dynamic export functionality will be subject to the timeline for development and implementation of the necessary market design and bidding modifications, which will be identified as the ISO receives specific project proposals. The discussion of specific details with the involved market participants will ensure that the ISO appropriately identifies the needed software changes.

To date, no entities have offered specific proposals for pilot implementation of pseudo-ties serving load. Rather than attempting to develop tariff language without the benefit of actual operational experience with pseudo-ties of load, the ISO maintains its willingness to develop pilots for these scheduling arrangements. A pilot approach will allow the ISO, neighboring BAA and requesting participants to learn and revise if necessary rules that may generally be applied in the future, and for the ISO to identify and implement appropriate enhancements to its current market software.

### **3.11. Layoffs**

Under the ISO's existing pseudo-tie pilots, layoffs (energy transfers of a portion of a pseudo-tie generator's output back to the native BAA) are allowed but the layoffs are treated as firm static exports from the ISO. For a conventional dynamic schedule, the portion of the generator's schedule that is not scheduled into the ISO is an external schedule that the ISO does not see. In the case of layoffs from pseudo-ties, the ISO assesses all export charges except wheeling charges to the layoffs since the layoffs do not actually flow through the ISO's transmission system. The ISO will continue to support layoffs from pseudo-ties as it does in the pilots.

One potential concern about the use of layoffs is that a resource could schedule into the ISO as a pseudo-tie generator, and then export its output as a layoff of firm energy, simply to market what would otherwise be a unit contingent energy sale and thus achieve a better energy price in the regional markets. The ISO's existing tariff provisions assess the costs of operating reserves to firm exports, but this marketing practice could increase the ISO's ancillary service market clearing prices. The ISO will develop provisions to address such operational and market conditions if they are found to be significant.

Another potential form of uneconomic bidding behavior would occur if a pseudo-tie generator were to receive a higher LMP at its physical location than the LMP that it would pay to export layoff energy at a "contract path" scheduling point. The ISO will address this issue by charging for layoff exports from a pseudo-tie at the same location (i.e., the same LMP) that the pseudo-tie generator is paid for its generation output.

### **3.12. Division of physical generators into multiple dynamic schedules**

At the March 17 stakeholder meeting, one topic of discussion was whether a physical generator could be split into separate dynamically scheduled resources on different interties, to facilitate situations where a resource owner cannot obtain transmission on a single external transmission path for the resource's full capacity. The discussion did not ask to divide the physical generation according to market conditions, but rather to establish resources with fixed capacities for each share of a generator. The ISO observes that there is a precedent for supporting this arrangement, which is that when the ISO filed letter agreements for three

dynamic schedules, prior to the filing of Amendment 59 to the ISO tariff, two of the agreements were for shares of ownership in the Merchant power plant.

With certain qualifications, the ISO is prepared to support other instances in which a generator outside the ISO's BAA is divided into separate dynamically scheduled resources. First, the resource owner would need to describe a clear business need for this arrangement. In addition to establishing a fixed proportion of the total capacity that would comprise each resource, the resource owner would need to establish a clear mechanism for allocating the generator's output between the separate dynamically-scheduled resources. The resource owner would need to separate the dynamic interchange communications into separate data streams that appear to the ISO as if the resources are actually separate.

The ISO's business systems (particularly metering, since the generator's physical metering would see the plant as a whole when it is a pseudo-tie) would not be able to support separate pseudo-tie resources based on a single generator, just as the ISO cannot divide generators within the ISO BAA between multiple resources. (This is due to data relationships between meters and business systems, and does not prevent multiple separately-metered generators at the same geographic site from being separate pseudo-tie resources.) However, in the ISO's understanding at this time, the resource owner's business needs could be satisfied through dynamic scheduling, rather than necessarily requiring a pseudo-tie. When market participants identify clear business needs that could not be satisfied through regular dynamic scheduling arrangements, the ISO will consider such needs as they arise and determine appropriate solutions. For example, a stakeholder comment asks whether a physical generator can be split into multiple dynamic schedules at the same intertie, and the ISO's consideration of the specific instance would need to consider whether the existing inter-SC trade mechanism would meet the business needs.

### **3.13. Firmness of transmission**

Currently, ISO tariff provisions including section 6.1 of Appendix X (Dynamic Scheduling Protocol) require dynamic transfers to be supported by firm transmission reservations in each operating hour, although this is not a requirement for long term firm transmission. Stakeholder comments on the Straw Proposal pointed out that for practical purposes, the requirement for firm transmission can create a requirement for day-ahead scheduling that the Straw Proposal does not otherwise require. The basis for this conclusion is that intertie capacity may not be available after the day-ahead timeframe, which can occur because either (1) available intertie capacity into the ISO is fully scheduled in the day-ahead market, or (2) a market participant can only obtain non-firm transmission through other BAs to get to the ISO's scheduling points, after the day-ahead timeframe. In the first case, the unavailability of transmission into the ISO after the day-ahead market is the result of market competition for limited intertie capacity, and the ISO cannot favor one class of market participants over others in awarding capacity (other than for contractual requirements such as pre-existing transmission encumbrances).

Concerning the possibility that a market participant can only obtain non-firm transmission through other BAs after the day-ahead timeframe, the ISO has examined what its actual needs are for the use of firm transmission. In the case of pseudo-ties, the resource essentially becomes part of the ISO BAA, and the ISO relies on the pseudo-tie resource just as it relies on generation within the ISO's geographic boundary, so the ISO will continue to require firm transmission.<sup>29</sup> For dynamic schedules providing ancillary services, the ISO counts the awards

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<sup>29</sup> LS Power's June 10, 2010, comments on the Draft Final Proposal describe the interconnection provisions for resources that connect to the Palo Verde Common Bus, which it describes a requirement for funding network upgrades and a resulting allocation of ATC across the common bus.

to dynamic resources in meeting its reliability obligations, so the ISO must also require firm transmission. However, dynamic schedules of energy contribute to the ISO's balance of supply and demand similarly to the contributions of static interchange schedules, some of which use non-firm transmission to get to the ISO's scheduling points. Thus, the ISO proposes to not require firm transmission through external BAAs for dynamic schedules of energy (i.e., not including pseudo-ties and ancillary services, which require firm transmission).<sup>30</sup>

### 3.14. Documentation for ancillary service certification

In its prior efforts to implement dynamic schedules, the ISO has encountered concerns with the forms of documentation required by the Dynamic Scheduling Protocol in Appendix X of the ISO tariff, particularly some of the documentation required of affected BAAs in conjunction with certification of the ability to provide ancillary services from a dynamic system resource. The ISO proposes to modify these documentation requirements to address some of the concerns previously encountered.<sup>31</sup>

### 3.15. Coordination with neighboring BAAs, to avoid creating seams issues

The final area to be noted in relation to market design options is that neighboring BAAs are currently facing similar issues with regard to integrating large amounts of intermittent resources. They face similar issues as those discussed in this document and are developing their own solutions to these issues, which the ISO continues to examine to identify potential common solutions. The current initiatives of other BAAs on which the ISO is examining as part of its coordination with neighboring areas include:

- Joint Initiatives efforts: In mid-2008, representatives from Columbia Grid, Northern Tier Transmission Group, and WestConnect joined forces to pursue a number of projects that would benefit from a broader level of participation and geographic economies of scale. Current initiatives sponsored by the collaborative include facilitation of intra-hour energy and transmission transactions, dynamic scheduling protocols, and sharing of area control error (ACE) diversity. These mechanisms would allow a sharing of the regulation

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The Palo Verde Common Bus does not become part of the ISO BAA or controlled grid through this process, but the described arrangement satisfies the requirement for firm transmission through the external transmission system.

<sup>30</sup> Allowing dynamic schedules of energy to use non-firm transmission does not change other tariff provisions related to the use of non-firm transmission, such as settlements of obligations for operating reserves. Schedules within the ISO continue to represent firm transmission.

<sup>31</sup> The ISO has an existing certification process for dynamically scheduled ancillary services, including regulation, and balancing authorities from which such imports are to be scheduled. Applicable tariff provisions include but are not limited to section 8.3.4 (Certification and Testing Requirements), section 8.4 (Technical Requirements for Providing Ancillary Services), and Appendix K (Ancillary Service Requirements Protocol). These provisions apply to both generating units and system resources that provide ancillary services across interties. In addition, dynamically scheduled resources are subject to Appendix X (Dynamic Scheduling Protocol), and dynamically scheduled resources that provide regulation are subject to the ISO's Standards for Imports of Regulation. This certification includes a requirement that the sending balancing authority and the SC representing the system resource demonstrate that they have made appropriate arrangements and have put in place the equipment and services necessary to deliver the ancillary services to the point of interchange with the ISO BAA. In addition, the ISO requires the balancing authority from which the ancillary services are to be scheduled to enter into an agreement with the ISO for interconnected BAA operations. Minor modifications will clarify the documentation required for the certification process.

and operational burden beyond simply shifting the burden to the sending or receiving balancing authorities. Information is available at <http://www.columbiagrid.org/ji-nttg-wc-overview.cfm>. The ISO's implementation of future dynamic transfer agreements will consider use of the Dynamic Scheduling System (DSS), and the ISO sees its implementation of dynamic transfers as supporting the needs of intra-hour scheduling. In the January 27, 2011, Discussion Paper for February 1 Conference Call, and in the February 1 call, the ISO described a pilot program that it has initiated with Bonneville Power Administration for implementation of intra-hour scheduling using the mechanisms of dynamic scheduling.

- The Bonneville Power Administration (BPA) has developed a set of wind integration charges that are applicable to intermittent resources in its BAA. There may be merit in implementing similar charges for similar functions in BAAs such as the ISO that have significant amounts of interchange schedules with BPA, when a future ISO stakeholder process considers cost allocation issues. Further information is available at [http://www.transmission.bpa.gov/wind/dynamic\\_transfer/default.cfm](http://www.transmission.bpa.gov/wind/dynamic_transfer/default.cfm). As noted in section 2 of this document, a separate stakeholder process will include issues of cost allocation and cost sharing mechanisms for the ISO's regulation and load following requirements.
- WECC's Seams Issues Subcommittee has initiated the conceptual development of improved methods of regional congestion management, including creation of a real-time energy imbalance service covering areas where organized markets do not currently exist. The ISO is active in this effort, which is currently in early stages of its market design.

The ISO believes that the proposals contained in this document do not conflict with coordinating with these efforts, so that the ISO can proceed with this Final Proposal while its coordination is ongoing.

#### **4. Applicability of Proposals to Dynamic Schedules and Pseudo-Ties**

As stated in section 1, most proposals in this document apply to both dynamic schedules and pseudo-ties. Stakeholder comments have asked the ISO to specify which proposals apply to one or both of these forms of dynamic transfers, and the following table summarizes their applicability.



Topic	Applies to:	
	Dynamic Schedules	Pseudo-Ties
Transmission reservations	Yes	Yes
Congestion management	Yes	Yes
Dispatchability requirements and curtailment rules	Yes	Yes
Locational pricing	Yes	Yes
Pro rata allocation of deviations among BAAs	<b>Yes</b>	<b>No</b>
Limits of dynamic imports	Yes	Yes
Management of requests for dynamic transfers	Yes	Yes
Aggregation of conventional and/or renewable resources	Yes	Yes
Generator-only BAAs	<b>Yes</b>	<b>No</b>
Dynamic exports	Yes	Yes
Layoffs from pseudo-ties	<b>No</b>	<b>Yes</b>
Multiple dynamic schedules	<b>Yes</b>	<b>No</b>
Non-firm transmission	<b>Yes</b>	<b>No</b>
Documentation for ancillary service certification	Yes	Yes
Coordination with neighboring BAAs	Yes	Yes

## 5. Interim functionality

As noted in previous sections, the ISO currently supports both dynamic schedules and pseudo-ties in its daily operations.<sup>32</sup> To the extent that new dynamic transfers use the same functionality that supports the existing dynamic transfers, the ISO will be able to support the new dynamic transfers under the existing tariff or once tariff amendments are approved by FERC. In instances where the ISO will need to modify its existing market or operations systems, the ISO will need to determine its implementation schedule. Until needed system enhancements can be implemented, the ISO will use interim functionality, as follows:

- **Transmission reservations:** The ISO will need to implement software changes to allow dynamic transfers to specify maximum deliveries exceeding their expected average delivery, and to settle congestion charges and the ISO's grid management charge for the greater of scheduled and actual delivery, as discussed in section 3.1 of this Final Proposal. Until these software changes can be implemented, the ISO will continue its existing market scheduling

<sup>32</sup> In instances where the previous sections note that the ISO is currently refining its support for existing dynamic transfers, the enhancements have been assumed to be in place prior to the filing of the tariff amendment resulting from the proposals described in this Final Proposal, so they are considered to be existing functionality for purposes of this section. This section does not discuss needs for interim functionality in instances where the ISO can implement tariff changes without substantial changes to its market or operations systems. Changes to business processes do not necessarily require significant software changes.

and settlement of transmission usage, including section 6.11 of ISO Tariff's Appendix X (Dynamic Scheduling Protocol).<sup>33</sup>

- Congestion management: Implementing the scheduling option discussed in section 3.2 of this Final Proposal, to allow intermittent resources to update their expected energy profile availability by 5-minute intervals for a forward-looking two-hour period, will require changes in the ISO's market software and communication of dispatches. Until these software changes can be implemented, the ISO will dispatch intermittent resources using the first scheduling option described in section 3.2, in which the ISO will use the most recent available telemetry reporting of the resource's output as its expected deliverability and real-time dispatch for the next dispatch interval (adjusted downward if necessary due to congestion), and will continue its efforts to improve its forecasting capability for intermittent resources.
- Dynamic exports: As discussed in section 3.10 of this Final Proposal, the specific market software design and bidding modifications to allow dynamic exports of supply resources that are geographically within the ISO's BAA will be identified as the ISO receives specific project proposals.
- Non-firm transmission: The ISO will need to document its tagging procedures and related systems and processes to identify dynamic schedules for energy that use non-firm transmission through external BAAs as allowed in section 3.13 of this Final Proposal.
- Coordination with neighboring BAAs: As discussed in section 3.15 of this Final Proposal, the ISO coordinates development of similar market initiatives, and recognizes benefits to supporting the Dynamic Scheduling System (DSS) that has been developed through the Joint Initiatives project. The requirements for supporting DSS may not require significant changes in the ISO's systems, but are being evaluated in further detail.

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<sup>33</sup> Section 6.11 of Appendix X provides: "In Real-Time the Dynamic Schedule may not exceed the maximum value established by the sum of the Day-Ahead Market and HASP/RTM accepted Energy and Ancillary Services Bids plus any response to the CAISO's Real-Time Dispatch Instructions. The composite value of the Dynamic Schedule derived from the Day-Ahead and HASP/RTM accepted Bids plus any Dispatch Instruction response represents not only the estimated Dynamic System Resource's Energy but also the transmission reservation on the associated CAISO Scheduling Point."

**Attachment E**

**Dynamic Transfer Proposal Tariff Language  
Correlation to Final Proposal Issued May 2, 2011  
and Board Memo Dated May 11, 2011**

**Dynamic Transfer Tariff Amendment  
July 29, 2011**

Final Proposal Provision [and Board Memo Reference]	Tariff Revisions
<b>3.1. Transmission reservations</b> [Board Memo #1]	<b>Interim functionality:</b> Limited provisions proposed in Sections 11.10.1.1.1, 11.10.1.2.1, 11.10.9.1; App. M (formerly App. X), Sections 1.5.1, 1.5.2, 1.5.8, 1.5.11, 1.7.3, 2.5.1,2.5.6, 2.5.9, 2.6.2; new App. N, Sections 1.2.1.5, 1.2.1.6, 1.2.1.11, 2.2.1.4, 2.2.1.8, 2.2.2.3, 2.2.3.4. <b>Long-term functionality:</b> To be addressed in additional tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>3.2. Congestion management [scheduling updates and forecasting]</b> [Board Memo #2]	<b>Interim functionality:</b> Accommodation to be implemented through ISO operating procedures. <b>Long-term functionality:</b> To be addressed in additional ISO operating procedures or tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>3.3. Dispatchability requirements and curtailment rules</b> [Board Memo #3]	App. B.5, Sections 3.2.2, 5.1; App. M (formerly App. X), Sections 1.5.7, 2.5.5; new App. N, Sections 1.2.1.3, 1.2.2.3, 2.2.1.10 for clarification of “operating order.”
<b>3.4. Locational pricing</b> [Board Memo #4]	Section 27.5.1.1; App. M (formerly App. X), Sections 1.7.4, 2.6.3; new App. N, Sections 1.2.1.1, 2.2.3.2.
<b>3.5. Pro rata allocation of deviations among balancing authority areas</b> [Board Memo #5]	App. B.9, Section 6.4.
<b>3.6. Limits of dynamic imports</b>	App. M (formerly App. X), Sections 1.4.1, 2.4.1; new App. N, Sections 1.2.1.15, 2.2.1.11.
<b>3.7. Management of requests for dynamic transfers</b>	No tariff changes proposed. Procedures to be developed for sharing of data regarding dynamic transfers agreements associated with particular interties, as described in the Final Proposal.
<b>3.8. Aggregation of conventional or renewable resources</b> [Board Memo #6]	Section 27.5.1.1; proposals will need to be considered on a case-by-case basis, subject to the ISO’s discretion to enter into a Dynamic Scheduling Agreement or Pseudo-Tie Participating Generator Agreement for a particular resource.
<b>3.9. Generator-only balancing authority areas</b> [Board Memo #7]	No tariff changes proposed, given ISO ability to review requests to enter into a Dynamic Scheduling Agreement on a case-by-case basis, as described in the Final Proposal.
<b>3.10: Implementation of dynamic exports</b> [Board Memo #8]	New Section 4.5.4.3.2; App. B.5, Sections 4.1.2, 4.1.4, 4.1.5, 4.1.6, 6.1, Schedule 1; App. M (formerly App. X), Section 2 (all).
<b>3.10. Implementation of pseudo-ties</b>	Sections 4.5.1.1.6.2, 4.6, 4.6.1.1, 4.15 (new), 4.16 (new), 6.5.5.1.1, 8.1, 8.2.3.3, 8.3.1, 8.3.2, 8.3.7, 9.3.6, 11.10.1.1.1, 11.10.1.2.1, 11.10.1.3.1, 11.10.9.1, 16.5.1, 17.2.1, 30.7.6.2, 33.6, 40.8.1.6, 40.8.1.12.1, 40.9.4.2.1, 43.5.2; definitions of Attaining Balancing Authority Area, Generating Unit, Native Balancing Authority Area, Node, Participating Generator, Pseudo-Tie Participating Generator Agreement, Pseudo-Tie, Wheeling Out; new App. B.16; App. I, Section 2.2.1; new App. N (all).
<b>3.11. Layoffs from pseudo-ties</b> [Board Memo #9]	New App. N, Sections 1.2.1.9, 1.2.3.1, 1.2.3.5.2, 2.2.1.2, 2.2.1.3, 2.2.3.5.
<b>3.12. Multiple dynamic schedules</b> [Board Memo #10]	App. M (formerly App. X), Sections 1.5.12, 2.5.10. No other tariff changes proposed, as accommodation of multiple dynamic schedules from a single resource is already implicit in the current definition of Dynamic System Resource by reference to the defined term System Resource.

<b>3.13. Non-firm transmission</b> [Board Memo #11]	App. M (formerly App. X), Section 1.5.1.
<b>3.14. Documentation for ancillary services certification</b> [Board Memo #12]	App. M (formerly App. X), Sections 1.6, 1.6.1, 1.6.3, 1.6.5, deletion of Attachment A; ISO standards for imports of regulation (revisions to be proposed).
<b>3.15. Coordination with neighboring balancing authority areas</b>	The ISO has undertaken coordination with neighboring balancing authority areas regarding general ISO expansion of dynamic transfers services outside the provisions of the tariff. As described in the Final Proposal, the ISO will continue to evaluate the need for pilot projects and tariff revisions to address dynamic transfers initiatives in neighboring balancing authority areas. The need for coordination for specific dynamic transfers arrangements is embodied in Sections 4.5.4.3, 8.3.7.2; App. B.5, Section 4.1.3, Schedule 1; App. B.9; new App. B.16, Sections 3.2.1, 4.1.1, Schedule 1; numerous provisions of App. M (formerly App. X) and new App. N.
<b>5. Interim functionality</b> [Board Memo end of Proposal section]	Interim functionality is embodied in tariff provisions described above. Long-term functionality will be addressed in additional tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>Footnote 4: Dynamic system resources as Eligible Intermittent Resources</b>	Sections 34.11.2, 40.8.1.6, 40.8.1.12.1; the definition of Eligible Intermittent Resource; App. Q, Sections 2.2.1, 2.2.2(c); App. M (formerly App. X), Sections 1.5.10, 2.5.8; new App. N, Sections 1.2.1.10, 2.2.2.1.
<b>End of 2: Qualifying capacity for resource adequacy</b>	Sections 40.8.1.6, 40.8.1.12.1.
<b>Final Proposal Provision</b> [and Board Memo Reference]	<b>Tariff Revisions</b>
<b>3.1. Transmission reservations</b> [Board Memo #1]	<b>Interim functionality:</b> Limited provisions proposed in Sections 11.10.1.1.1, 11.10.1.2.1, 11.10.9.1; App. M (formerly App. X), Sections 1.5.1, 1.5.2, 1.5.8, 1.5.11, 1.7.3, 2.5.1, 2.5.6, 2.5.9, 2.6.2; new App. N, Sections 1.2.1.5, 1.2.1.6, 1.2.1.11, 2.2.1.4, 2.2.1.8, 2.2.2.3, 2.2.3.4. <b>Long-term functionality:</b> To be addressed in additional tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>3.2. Congestion management [scheduling updates and forecasting]</b> [Board Memo #2]	<b>Interim functionality:</b> Accommodation to be implemented through ISO operating procedures. <b>Long-term functionality:</b> To be addressed in additional ISO operating procedures or tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>3.3. Dispatchability requirements and curtailment rules</b> [Board Memo #3]	App. B.5, Sections 3.2.2, 5.1; App. M (formerly App. X), Sections 1.5.7, 2.5.5; new App. N, Sections 1.2.1.3, 1.2.2.3, 2.2.1.10 for clarification of "operating order."
<b>3.4. Locational pricing</b> [Board Memo #4]	Section 27.5.1.1; App. M (formerly App. X), Sections 1.7.4, 2.6.3; new App. N, Sections 1.2.1.1, 2.2.3.2.
<b>3.5. Pro rata allocation of deviations among balancing authority areas</b> [Board Memo #5]	App. B.9, Section 6.4.
<b>3.6. Limits of dynamic imports</b>	App. M (formerly App. X), Sections 1.4.1, 2.4.1; new App. N, Sections 1.2.1.15, 2.2.1.11.
<b>3.7. Management of requests for dynamic transfers</b>	No tariff changes proposed. Procedures to be developed for sharing of data regarding dynamic transfers agreements associated with

	particular interties, as described in the Final Proposal.
<b>3.8. Aggregation of conventional or renewable resources</b> [Board Memo #6]	Section 27.5.1.1; proposals will need to be considered on a case-by-case basis, subject to the ISO's discretion to enter into a Dynamic Scheduling Agreement or Pseudo-Tie Participating Generator Agreement for a particular resource.
<b>3.9. Generator-only balancing authority areas</b> [Board Memo #7]	No tariff changes proposed, given ISO ability to review requests to enter into a Dynamic Scheduling Agreement on a case-by-case basis, as described in the Final Proposal.
<b>3.10: Implementation of dynamic exports</b> [Board Memo #8]	New Section 4.5.4.3.2; App. B.5, Sections 4.1.2, 4.1.4, 4.1.5, 4.1.6, 6.1, Schedule 1; App. M (formerly App. X), Section B (all).
<b>3.10. Implementation of pseudo-ties</b>	Sections 4.5.1.1.6.2, 4.6, 4.6.1.1, 4.15 (new), 4.16 (new), 6.5.5.1.1, 8.1, 8.2.3.3, 8.3.1, 8.3.2, 8.3.7, 9.3.6, 11.10.1.1.1, 11.10.1.2.1, 11.10.1.3.1, 11.10.9.1, 16.5.1, 17.2.1, 30.7.6.2, 33.6, 40.8.1.6, 40.8.1.12.1, 40.9.4.2.1, 43.5.2; definitions of Attaining Balancing Authority Area, Generating Unit, Native Balancing Authority Area, Node, Participating Generator, Pseudo-Tie Participating Generator Agreement, Pseudo-Tie, Wheeling Out; new App. B.16; App. I, Section 2.2.1; new App. N (all).
<b>3.11. Layoffs from pseudo-ties</b> [Board Memo #9]	New App. N, Sections 1.2.1.9, 1.2.3.1, 1.2.3.5.2, 2.2.1.2, 2.2.1.3, 2.2.3.5.
<b>3.12. Multiple dynamic schedules</b> [Board Memo #10]	App. M (formerly App. X), Sections 1.5.12, 2.5.10. No other tariff changes proposed, as accommodation of multiple dynamic schedules from a single resource is already implicit in the current definition of Dynamic System Resource by reference to the defined term System Resource.
<b>3.13. Non-firm transmission</b> [Board Memo #11]	App. M (formerly App. X), Section 1.5.1.
<b>3.14. Documentation for ancillary services certification</b> [Board Memo #12]	App. M (formerly App. X), Sections 1.6, 1.6.1, 1.6.3, 1.6.5, deletion of Attachment A; ISO standards for imports of regulation (revisions to be proposed).
<b>3.15. Coordination with neighboring balancing authority areas</b>	The ISO has undertaken coordination with neighboring balancing authority areas regarding general ISO expansion of dynamic transfers services outside the provisions of the tariff. As described in the Final Proposal, the ISO will continue to evaluate the need for pilot projects and tariff revisions to address dynamic transfers initiatives in neighboring balancing authority areas. The need for coordination for specific dynamic transfers arrangements is embodied in Sections 4.5.4.3, 8.3.7.2; App. B.5, Section 4.1.3, Schedule 1; App. B.9; new App. B.16, Sections 3.2.1, 4.1.1, Schedule 1; numerous provisions of App. M (formerly App. X) and new App. N.
<b>5. Interim functionality</b> [Board Memo end of Proposal section]	Interim functionality is embodied in tariff provisions described above. Long-term functionality will be addressed in additional tariff amendments in conjunction with ISO functionality enhancements expected to be complete in spring of 2013, as described in the Board memo.
<b>Footnote 4: Dynamic system resources as Eligible Intermittent Resources</b>	Sections 34.11.2, 40.8.1.6, 40.8.1.12.1; the definition of Eligible Intermittent Resource; App. Q, Sections 2.2.1, 2.2.2(c); App. M (formerly App. X), Sections 1.5.10, 2.5.8; new App. N, Sections 1.2.1.10, 2.2.2.1.
<b>End of 2: Qualifying capacity for resource adequacy</b>	Sections 40.8.1.6, 40.8.1.12.1.

**Attachment F**

**List of Key Dates in Dynamic Transfers Stakeholder Process**

**Dynamic Transfer Tariff Amendment  
July 29, 2011**

<b>Date</b>	<b>Event/Due Date</b>
November 30, 2009	ISO issues paper entitled "dynamic transfer issue paper"
December 7, 2009	ISO hosts stakeholder meeting that includes discussion of ISO paper issued on November 30 and ISO presentation entitled "dynamic transfer stakeholder meeting"
December 14, 2009	Due date for written stakeholder comments on ISO paper issued on November 30
March 10, 2010	ISO issues paper entitled "dynamic transfer straw proposal"
March 17, 2010	ISO hosts stakeholder meeting that includes discussion of ISO paper issued on March 10 and ISO presentations entitled "dynamic transfer stakeholder meeting" and "dynamic transfers straw proposal stakeholder meeting"
March 31, 2010	Due date for written stakeholder comments on ISO paper issued on March 10
April 29, 2010	ISO issues paper entitled "supplement to dynamic transfers straw proposal"
May 6, 2010	ISO hosts stakeholder meeting that includes discussion of ISO paper issued on April 29 and ISO presentation entitled "stakeholder meeting on supplement to dynamic transfers straw proposal"
May 13, 2010	Due date for written stakeholder comments on ISO paper issued on April 29
May 20, 2010	ISO issues paper entitled "dynamic transfers draft final proposal"
May 27, 2010	ISO hosts stakeholder meeting that includes discussion of ISO paper issued on May 20 and ISO presentation entitled "dynamic transfers draft final proposal stakeholder meeting"
June 4, 2010	ISO issues paper entitled "summary of stakeholder comments and ISO responses on supplement to dynamic transfers straw proposal"
June 10, 2010	Due date for written stakeholder comments on ISO paper issued on May 20
June 11, 2010	ISO issues paper entitled "supplement to dynamic transfers draft final proposal"
June 18, 2010	ISO hosts stakeholder conference call that includes discussion of ISO paper issued on June 11 and ISO presentation entitled "dynamic transfer"
June 30, 2010	Due date for written stakeholder comments on ISO paper issued on June 11
July 14, 2010	ISO issues paper entitled "second supplement to dynamic transfers draft final proposal"
July 21, 2010	ISO hosts stakeholder conference call that includes discussion of ISO paper issued on July 14 and ISO presentation entitled "dynamic transfers: second"



Date	Event/Due Date
	supplement to draft final proposal”
July 28, 2010	Due date for written stakeholder comments on ISO paper issued on July 14
August 5, 2010	ISO market surveillance committee issues paper entitled “final opinion on the ISO’s dynamic transfer policy for intermittent resources”
August 16, 2010	ISO issues paper entitled “dynamic transfers revised draft final proposal”
August 23, 2010	ISO hosts stakeholder conference call that includes discussion of ISO paper issued on August 16 and ISO presentation entitled “dynamic transfers revised draft final proposal stakeholder conference call”
September 7, 2010	Due date for written stakeholder comments on ISO paper issued on August 16
October 6, 2010	ISO hosts stakeholder conference call that includes ISO presentation entitled “dynamic transfer study – COI & WOR”
October 13, 2010	Due date for written stakeholder comments on objectives, scope, and methodology of dynamic transfer study discussed on October 6 conference call
November 12, 2010	ISO issues paper entitled “summary of October 2010 stakeholder comments and ISO responses on intermittent dynamic transfer capability study”
November 19, 2010	ISO hosts stakeholder conference call that includes discussion of ISO paper issued on November 12 and ISO presentation entitled “impact of dynamic schedules on COI & WOR”
December 3, 2010	Due date for written stakeholder comments on intermittent dynamic transfer study
December 10, 2010	GE Energy issues paper entitled “draft final report on impact of dynamic schedules on interfaces”
December 17, 2010	ISO hosts stakeholder conference call that includes discussion of GE Energy paper issued on December 10 and ISO presentation entitled “impact of dynamic schedules on COI & WOR”
December 27, 2010	Due date for written stakeholder comments on GE Energy paper issued on December 10
January 7, 2011	ISO issues paper entitled “summary of December 10, 2010 stakeholder comments on intermittent dynamic transfer capability study”; GE Energy issues paper entitled “final report on impact of dynamic schedules on interfaces”
January 27, 2011	ISO issues papers entitled “discussion paper for February

Date	Event/Due Date
	1, 2011, conference call in dynamic transfer stakeholder process” and “supplement to discussion paper for February 1, 2011, conference call in dynamic transfer stakeholder process”
February 1, 2011	ISO hosts stakeholder conference call that includes discussion of ISO papers issued on January 27 and ISO presentation entitled “status update in dynamic transfer stakeholder process”
February 8, 2011	Due date for written stakeholder comments on ISO papers issued on January 27
February 18, 2011	ISO issues papers entitled “dynamic transfers revised draft final proposal” and “supplement to dynamic transfers revised draft final proposal”
February 25, 2011	ISO hosts stakeholder meeting that includes discussion of ISO papers issued on February 18 and ISO presentation entitled “dynamic transfer stakeholder meeting on revised draft final proposal”
March 7, 2011	ISO issues paper entitled “dynamic transfers preliminary formulation of software function for transmission reservation”
March 11, 2011	Due date for written stakeholder comments on ISO papers issued on February 18
April 1, 2011	ISO issues paper entitled “second supplement to dynamic transfers revised draft final proposal”
April 8, 2011	ISO hosts stakeholder meeting that includes discussion of ISO paper issued on April 1 and ISO presentation entitled “dynamic transfer conference call on revised draft final proposal”
April 15, 2011	Due date for written stakeholder comments on ISO paper issued on April 1
May 2, 2011	ISO issues papers entitled “dynamic transfers final proposal” and “summary of April 15, 2011, stakeholder comments and ISO responses on dynamic transfers second supplement to revised draft final proposal”
May 19, 2011	ISO Governing Board authorizes preparation and submittal of dynamic transfers tariff amendment
June 8, 2011	ISO issues draft tariff language to implement dynamic transfers tariff amendment
June 15, 2011	ISO hosts stakeholder conference call that includes discussion of draft tariff language issued on June 8
June 17, 2011	ISO issues supplement to draft tariff language to implement dynamic transfers tariff amendment
June 22, 2011	Due date for written stakeholder comments on draft tariff language issued on June 8 and supplement to draft tariff language issued on June 17

<b>Date</b>	<b>Event/Due Date</b>
July 7, 2011	ISO issues second draft of tariff language to implement dynamic transfers tariff amendment and issues papers entitled “summary of June 22-23, 2011, stakeholder comments and ISO responses on dynamic transfers tariff revisions” and “dynamic transfer proposal tariff language correlation to final proposal issued May 2, 2011 and board memo dated May 11, 2011”
July 21, 2011	ISO hosts stakeholder conference call that includes discussion of second draft of tariff language to implement dynamic transfers tariff amendment; ISO issues third draft of tariff language to implement tariff amendment

**Attachment G**

**Board Memorandum and Resolution**

**Dynamic Transfer Tariff Amendment  
July 29, 2011**

# Memorandum

**To:** ISO Board of Governors

**From:** Keith Casey, Vice President, Market and Infrastructure Development

**Date:** May 11, 2011

**Re:** Decision on Dynamic Transfers

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*This memorandum requires Board action.*

## EXECUTIVE SUMMARY

Historically, imported power from other regions throughout the west serves approximately 25% of California's electricity demand. Most of this imported energy is provided by fixed hourly schedules on the transmission interties between neighboring regions. This is the standard scheduling practice for the west. However, there are limited cases where certain intertie schedules between the ISO and other balancing authorities<sup>1</sup> are allowed to vary within the hour – a practice referred to as “dynamic transfers.”

In this proposal, Management recommends various tariff clarifications and modifications that will provide greater opportunities for imports and exports to the ISO system to be scheduled dynamically within the hour. Importantly, these changes include extending dynamic transfers to renewable energy resources, which will provide greater opportunities for renewable resources outside of our system to be used to meet California's renewable portfolio standard. These changes, which have broad stakeholder support, will also better enable each region to manage and share the obligation of balancing the variable output from renewable energy resources.

The specific recommended tariff modifications cover the following twelve issues, each of which is described in the main body of this memo.

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<sup>1</sup> A balancing authority is the responsible entity that integrates resource plans and maintains the load-resource balance within a balancing authority area. A balancing authority is the collection of generation, transmission, and loads within the metered boundaries of the balancing authority. The ISO is a balancing authority, as is Bonneville Power Administration, and other similar entities.

1. Transmission reservations
2. Scheduling update and forecasting
3. Dispatchability requirements and curtailment rules
4. Locational pricing
5. Pro rata allocation of deviations among balancing authorities
6. Aggregation of conventional and renewable resources
7. Generator-only balancing authorities
8. Dynamic exports
9. Layoffs from pseudo-ties
10. Multiple dynamic schedules
11. Non-firm transmission
12. Documentation for ancillary service certification

Management proposes the following motion to clarify the tariff regarding dynamic schedules and expand the allowable use of dynamic transfers:

***Moved, that the ISO Board of Governors approves the proposal to implement the dynamic transfers proposal, as described in the memorandum dated May 11, 2011; and***

***Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.***

## **BACKGROUND**

The *California renewable portfolio standard* requires 20% of retail energy sales to be met by renewable energy by 2012 to 2013 and 33% by 2020. These standards have triggered a tremendous surge in renewable energy resource development throughout California and the rest of the west. In the process, this surge in development has raised practical concerns about the ability and responsibility of each balancing authority to balance the variable output from renewable resources – particularly if the output is being exported out of the balancing authority where the resource resides (host balancing authority).

California's renewable portfolio standard has also raised significant interest among renewable resource developers for enhanced opportunities to import renewable energy to the ISO balancing authority. Currently, the only option for a renewable resource to import to the ISO is to use a static hourly schedule. Management proposes to add another option that would allow dynamic transfers of renewable energy. Management also proposes to clarify tariff provisions for dynamic transfers for conventional resources to allow two mechanisms for dynamic transfers – a “pseudo-tie” and “dynamic schedule.” A pseudo-tie effectively transfers the external generation resource into the ISO balancing authority. A dynamic schedule transfers the resource's energy schedule, but not the resource itself, into the ISO balancing authority.

The generation output from renewable resources such as wind and solar generation can be highly variable. For a variable renewable resource to import to the ISO balancing authority as a static schedule, its variability would need to be managed externally, at the expense of the entity scheduling the import. To overcome the physical and cost barriers of externally balancing this variability, renewable resource developers want to use dynamic transfers. With dynamic transfers, our balancing authority would manage the balancing of variability, where the renewable imports are serving load in the ISO balancing authority and contributing to meeting California's renewable portfolio standard. Historically, we have not permitted dynamic transfer of renewable resources because of concerns about the impact on reliability.

As a result of the interest in dynamic transfers by renewable resource developers in other balancing authorities, Management has given further consideration to the reliability and other issues associated with these types of dynamic transfers. Management now proposes rules necessary to reliably accommodate dynamic transfers of variable resources as well as conventional resources.

## **PROPOSAL**

Management's specific proposed revisions are summarized below and stated in detail in the *Dynamic Transfers Final Proposal*, dated May 2, 2011.<sup>2</sup> This proposal addresses issues that affect dynamically transferred resources. In particular, dynamic transfers are scheduled over interties. This practice subjects them to requirements that resources internal to the ISO balancing authority do not face. With the few exceptions noted below, all recommendations apply to both types of dynamic transfers, dynamic schedules and pseudo-ties. This memo provides a summary of stakeholder views on the proposed recommendations, and a separate table provides further discussion of stakeholder comments.

### **1. *Transmission reservation***

Expanding dynamic transfers to include variable resources raises a concern of how to balance efficient transmission utilization with reserving sufficient transmission capacity for renewable resources' variable output. The existing ISO tariff establishes a transmission reservation for dynamic schedules that equals their energy schedules. Management proposes that, on an hourly basis, a dynamic transfer may bid to establish a transmission reservation greater than its energy schedule, to ensure that transmission is available for its maximum expected transfer for the hour. However, within the hour, a dynamic transfer may be dispatched above or below its transmission reservation based on available transmission. If a dynamic transfer delivers above its reservation and actual flows on the path exceed the flow limit, the dynamic transfer must comply with operating orders to reduce deliveries to the level of its transmission reservation. In addition, deliveries above its reservation will be subject to all applicable imbalance and congestion settlement consequences under the tariffs of the ISO and other transmission providers.

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<sup>2</sup> The Dynamic Transfers Final Proposal is posted at <http://www.caiso.com/2b72/2b72e3f642fa0.pdf>.

## ***2. Scheduling updates and forecasting***

To efficiently dispatch all ISO resources over the real-time operating horizon, Management proposes a scheduling option that will allow dynamic transfers of variable resources to update their expected available energy deliveries within the operating hour. This will allow us to manage variability within operating hours and maintain high transmission use by dispatching other resources. Alternatively, we would dispatch variable resources based on the expectation that what the resource is currently delivering will persist. In either case, dynamic transfers of variable resources may also offer bids that allow the ISO to dispatch the resources below their available delivery.

In addition, a dynamic transfer of a variable resource will be considered an *eligible intermittent resource* under the tariff, to promote consistency of treatment of both internal and external variable resources in other respects. Currently, owners of eligible intermittent resources are required to provide necessary meteorological and telemetry data to allow us to develop its own energy forecast for the resource, and this proposal would ensure that the ISO can obtain this same information from external variable resources dynamically transferred to our balancing authority as it does from internal resources.

## ***3. Dispatchability requirements and curtailment rules***

Dynamically transferred resources must be able to respond immediately to intertie schedule curtailments. Operating procedures will recognize the characteristics of new dynamic resources for this purpose. In addition, this proposal establishes new requirements for compliance with operating orders with consequences uniquely tailored to dynamic transfers. The new requirements, which will replace the existing requirements, will require that a dynamic transfer comply with an ISO operating order. Failure to comply with such an operating order three times will require that the resource install necessary automated equipment to ensure compliance with future operating orders. If no remedy for compliance is installed, the dynamic transfer agreement may be suspended until compliance measures are completed.

## ***4. Locational pricing***

Within its balancing authority area, the ISO models and prices generation and dispatchable load at their physical locations. This proposal applies the same principle to dynamic transfers that are associated with specific generation resources. Such resources will be modeled and priced at their actual locations.

## ***5. Pro rata allocation of deviations among balancing authority areas***

A resource located outside of the ISO balancing authority can schedule part of its output to the ISO as a dynamic schedule and the rest of its output to its host balancing authority (i.e., the balancing authority area in which it is located). To address the circumstance where the resource's total output deviates from its total schedule (ISO



dynamic schedule and schedule to its host balancing authority), Management proposes to revise the tariff to incorporate a pro rata sharing of such deviations between balancing authorities. This will limit the ISO's balancing responsibility to its fair share. This proposal applies specifically to dynamic schedules, because pseudo-ties essentially become part of the attaining balancing authority and thus all deviations are assigned to the attaining balancing authority.

#### **6. *Aggregation of conventional or renewable resources***

By allowing dynamic transfers from an aggregation of resources (conventional and renewable), this proposal provides opportunities to offset variation in variable resources' delivery. Within its balancing authority, the ISO allows aggregation of resources only for connections to the same substation and voltage level. This measure is to ensure accurate modeling of flows within the ISO controlled grid. For resources outside the ISO balancing authority, Management proposes to allow aggregation within broader geographic areas where the resources have similar impacts on transmission constraints within the ISO balancing authority.

#### **7. *Generator-only balancing authority areas***

Balancing authority areas are generally large regions that include both generation and load. However, in some cases a balancing authority area can consist of just generation resources. This proposal permits dynamic scheduling agreements with balancing authorities that only contain generation, subject to satisfaction of specific conditions. Approval will depend on the balancing authority demonstrating it can manage inadvertent energy and maintain sufficient contingency reserves.

#### **8. *Dynamic exports***

Most of the ISO's existing dynamic transfers are for imports to the ISO balancing authority. However, the ISO has successfully operated under a pilot pseudo-tie agreement for a generating facility wherein the facility is connected to the ISO grid but is effectively part of another balancing authority. This proposal allows additional dynamic exports of supply (not load) resources located within the ISO balancing authority area. This proposal only applies to resource schedules that cross the interties between the ISO and other balancing authorities. Management does not recommend placing provisions in the tariff for dynamic exports of load until the ISO has operational experience through a pilot.

#### **9. *Layoffs from pseudo-ties***

The existing pseudo-tie import pilot agreement for the Sutter combined cycle generating facility allows its owner to sell a portion of its output to its host balancing authority, which is referred to as a "layoff" schedule. This proposal supports exports to host balancing authorities from pseudo-tie generating facilities. This option is unique to a pseudo-tie and is not needed for dynamic schedules.

## **10. *Multiple dynamic schedules***

In some instances, generators outside the ISO balancing authority would like to dynamically schedule into the ISO balancing authority but cannot obtain a contract for their full capacity on a single external transmission path. This proposal allows an external generator to be split into separate dynamically scheduled resources (not pseudo-ties), which would be scheduled on different interties.

## **11. *Non-firm transmission***

Energy schedules within and across a balancing authority can have different types of transmission service, the most dependable of which is “firm” transmission service where the transmission service will be provided unless it is forced out of service. The ISO provides firm transmission service to all of its awarded market schedules within the ISO balancing authority. But some intertie schedules are not supported by firm transmission outside the ISO balancing authority area. The tariff currently requires dynamic schedules to obtain firm transmission for the operating hour, but not for longer durations.

Variable resources using dynamic schedules may not know their hour-to-hour deliveries until close to the operating hour. In addition, some external transmission providers do not offer firm transmission until after the close of the ISO day-ahead market. This proposal allows dynamic schedules of energy to use non-firm transmission through external balancing authorities, which is reserved or scheduled on an as-available basis and is subject to interruption. This arrangement will avoid unnecessarily buying firm transmission that later goes unused, and thus will promote more efficient use of transmission. This arrangement will not apply to pseudo-ties, dynamic scheduling of ancillary services, or dynamic scheduling of resource adequacy capacity, which will still require firm transmission service.

## **12. *Documentation for ancillary service certification***

The tariff specifies the requirements for ancillary service certification, but there has been uncertainty regarding the documentation needed for dynamic schedule resources to demonstrate they meet these requirements. This proposal clarifies the documentation requirements for certification of dynamic imports of ancillary services.

The ISO plans to take a phased approach to implementing the modifications described above. To the extent that new dynamic transfers use the same functionality that supports the existing dynamic transfers, the ISO will be able to support the new dynamic transfers under the existing tariff or once tariff amendments are approved by the Federal Energy Regulatory Commission. In some instances, the ISO proposal requires modification to the existing market or operations systems.

Until functionality enhancements are implemented, the ISO market will establish transmission reservations equal to energy schedules as the tariff now provides. Implementation of functional changes to support the provisions associated with transmission reservations and scheduling updates are expected to be complete in spring 2013.

## **POSITIONS OF THE PARTIES**

The ISO has worked with stakeholders for over a year to develop this proposal. One foundational issue concerning the policy for managing requests for dynamic transfers is whether the ISO must limit the amount of dynamic transfers of variable resources due to operating criteria. To answer this, Management contracted with General Electric for a study that was published in January 2011. General Electric examined reliability issues and concluded that the ISO does not need to apply limits on dynamic transfers to its balancing authority area at this time.

However, other balancing authorities may establish limits based on conditions within their balancing authority areas. The ISO will continue to coordinate with other balancing authorities on regional issues affecting dynamic transfer capability. To allow market participants who are developing or contracting for new dynamically transferred resources to self-manage risks about deliverability to the ISO market, Management proposes to provide data on the ISO website, the number of dynamic transfer agreements at specific interties.

Despite the General Electric study results, PG&E recommended establishing a limit on the amount of dynamic transfers, equal to the intertie import limit, to allow operational experience and evaluation before considering additional dynamic transfers. Management disagrees with PG&E that an explicit limit needs to be established, as that would create operational inefficiencies and complications for managing requests for dynamic transfers. However, Management proposes to address PG&E's concern by regularly performing an operational assessment of impacts of dynamic transfers. If such operational assessments reveal that limitations are needed in the future, Management will take appropriate action, which may include a moratorium on new dynamic transfers of variable resources.

Some parties were concerned that the proposed transmission reservation would result in transmission underutilization. Management performed additional analysis to demonstrate that transmission reservation would not materially impact transmission utilization. Additionally, Management made certain modifications to how transmission reservations can be used that will mitigate the potential for them to cause transmission underutilization. Some parties asked for clarification whether requiring a transmission reservation for dynamic transfers restricts flexibility in scheduling, while another questioned whether Western Electricity Coordinating Council criteria allow flexibility in scheduling. Management has explained the basis of its proposals through reference to the North American Electric Reliability Corporation and WECC standards and other documents. These efforts address most concerns with the proposed transmission reservation.

Some stakeholders wanted to address issues that extend beyond dynamically transferred resources policy. In this stakeholder process and this proposal, Management has focused on topics specific to dynamic transfers. More general issues that apply to both internal and external resources will be addressed through other stakeholder processes. Those issues are not included in this proposal.

NextEra, LS Power, and other stakeholders asked the ISO to clarify requirements for resources using dynamic transfers to qualify as resource adequacy capacity. Other California Public Utilities Commission and ISO processes have previously established these requirements. Eligibility as a resource adequacy resource is contingent upon a showing that an import has secured firm transmission through any intervening balancing authority for the applicable operating hours, and that the load serving entity has an allocation of import capacity at the import scheduling point. Variable resources within the ISO balancing authority area have an additional protocol for establishing qualifying capacity through the CPUC's "exceedance" methodology. Management proposes to apply the same exceedance methodology to dynamic transfers of variable resources.

Imperial Irrigation District, Sacramento Municipal Utility District, and other stakeholders encourage the ISO to continue its active coordination with other affected balancing authorities regarding similar market initiatives that they are developing. Management is actively participating in such regional coordination. The ISO briefed WECC's seams issue subcommittee and variable generation subcommittee regarding the dynamic transfers policy changes described in this memo, as well as meeting individually with neighboring balancing authorities and coordinating with other joint initiatives as opportunities occur to reduce seams between markets.

#### **MANAGEMENT RECOMMENDATION**

Management requests Board approval of this proposal for dynamic transfers as set forth in this memo. These revisions and clarifications to current ISO policies and tariff provisions will position the ISO to effectively manage all resources that participate in the ISO market using dynamic transfers, as well as facilitating the state's goals for renewable energy development.



Board of Governors

May 18-19, 2011

Decision on Dynamic Transfers

**Motion**

***Moved, that the ISO Board of Governors approves the proposal to implement the dynamic transfers proposal, as described in the memorandum dated May 11, 2011; and***

***Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.***

**Moved: Galiteva    Second: Bhagwat**

Board Action: <b>Passed</b> Vote Count: <b>4-0-0</b>	
Bhagwat	Y
Foster	Y
Galiteva	Y
Mullin	Y

**Motion Number: 2011-05-G7**

## Stakeholder Process: Dynamic Transfers Summary of Submitted Comments

Stakeholders submitted thirteen rounds of written comments to the CAISO on the following dates:

12/14/2009	6/10/2010	9/7/2010	12/27/2010	4/15/2010
3/31/2010	6/30/2010	10/3/2010	2/8/2010	
5/13/2010	7/28/2010	12/3/2010	3/11/2010	

Stakeholder comments are posted at: <http://www.caiso.com/27b9/27b980b1477b0.html>

Parties that submitted written comments:

Alliance for Retail Energy Markets	Center for Energy Efficiency and Renewable Technologies	Sempra Generation
Bay Area Municipal Transmission	Dynegy	"Six Cities"
Calif. Dept. of Water Resources	Idaho Power	Sacramento Municipal Utilities District
Calif. Energy Resource Scheduler	Imperial Irrigation District	Transmission Agency of Northern Calif.
Calif. Municipal Utilities Assoc.	LS Power	US Dept. of Energy, Berkeley Site
CPUC Staff	NextEra Energy	Western Area Power Administration
Calif. Wind Energy Assoc./	Pacific Gas and Electric	Western Power Trading Forum
Large-scale Solar Assoc.	Powerex	Xcel Energy
Calpine	Southern California Edison	ZGlobal Energy
		8Minutenergy

This document's summary of stakeholder comments summarizes the parties' position statements on subjects described in Management's proposal to the ISO Board of Governors.

In-person stakeholder meetings were held on the following dates:

12/7/2009	3/17/2010	5/6/2010	5/27/2010	2/25/2011
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Stakeholder conference calls were held on the following dates:

6/18/2010	7/21/2010	8/23/2010	10/6/2010
11/19/2010	12/17/2010	2/1/2011	4/8/2011

Market Surveillance Committee opinion on management of requests for dynamic transfers was adopted in a conference call on 8/5/2010.

Attachment A: Dynamic Transfers: Stakeholder Matrix

	California Municipal Utilities Association	California Public Utilities Commission Staff	California Wind Energy Association and Large-scale Solar Association
Overall Proposal	Supports this initiative as a policy priority to promote regional approach to renewable procurement.	Effective use of dynamic transfers will unquestionably be important for achieving California's renewable portfolio standard goals.	Strongly support ISO's initiative. Dynamic transfers will be essential for meeting renewable portfolio standards.
Transmission Reservation	No comments	Supports proposal as reasonable for low renewable penetration. At higher level, intra-day and intra-hour scheduling with more consistent WECC-wide market rules may be needed.	ISO should manage transmission capacity as is done within ISO. Transmission reservations for dynamic transfers impose unnecessary requirements that do apply to resources within ISO.
Scheduling Updates and Forecasting	No comments	Supports proposed data requirements to support forecasting. Dispatchable resources will be needed to fill in under-used space on interties.	Supports proposed options.
Dispatchability Requirements and Curtailment Rules	No comments	Supports proposal.	Supports proposal to first use economic bids to manage congestion. Transmission reservations should not affect congestion management.
Locational Pricing	No comments	No comments	No comments
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	No comments	No comments
Aggregation of Conventional and/or Renewable Resources	No comments	Supports proposal.	No comments
Generator-Only Balancing Authorities	No comments	Supports proposal.	No comments
Dynamic Exports	Reciprocal import and export policies are required.	Encourages pilots.	No comments
Layoffs from Pseudo-ties	No comments	No comments	No comments
Multiple Dynamic Schedules	No comments	No comments	Supports proposal.
Non-firm Transmission	No comments	Allowing use of non-firm transmission increases options for market participation, but outcome is uncertain.	Supports proposal for dynamic schedules. Proposal lacks clarity for pseudo-ties.
Documentation for Ancillary Service Certification	No comments	No comments	No comments
Other Issues	ISO effort must dovetail with neighboring balancing authorities, particularly the Dynamic Scheduling System.	CPUC Staff agrees with the MSC conclusion that west-wide harmonization of policies for balancing services should be a high priority.	No comments

Attachment A: Dynamic Transfers: Stakeholder Matrix

	Calpine	Center for Energy Efficiency and Renewable Technologies	Imperial Irrigation District
Overall Proposal	Supports proposed expansion of dynamic transfers.	Commends ISO for this undertaking and for responsive stakeholder process.	Supports ISO's development of dynamic transfers, and requires this capability.
Transmission Reservation	No comments	Should manage transmission like is done within ISO	No comments
Scheduling Updates and Forecasting	No comments	No comments	No comments
Dispatchability Requirements and Curtailment Rules	Decremental dispatch capability should be required, in order similar to proposal. The term "operating order" should be clearly defined.	No comments	No comments
Locational Pricing	No comments	No comments	Required data should not extend beyond data required for generators.
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	No comments	No comments
Aggregation of Conventional and/or Renewable Resources	Supports proposal.	No comments	No comments
Generator-Only Balancing Authorities	Supports proposal.	No comments	No comments
Dynamic Exports	Supports proposal.	No comments	No comments
Layoffs from Pseudo-ties	No comments	No comments	No comments
Multiple Dynamic Schedules	Supports proposal.	No comments	No comments
Non-firm Transmission	To maintain historical market practices, ISO should require firm transmission.	No comments	No comments
Documentation for Ancillary Service Certification	No comments	No comments	No comments
Other Issues	No comments	Supports proposed use of ISO's existing congestion management system to manage intertie capacity for dynamic transfers, since it is exemplary in its ability to optimally allocate existing transmission.	In studies of dynamic transfer capability, expertise is available through conferring with neighboring balancing authorities. ISO should adopt Dynamic Scheduling System developed through Joint Initiatives to fully integrate dynamic transfers.



Attachment A: Dynamic Transfers: Stakeholder Matrix

	LS Power	NextEra Energy	Pacific Gas and Electric
Overall Proposal	ISO has established workable framework for intermittent dynamic transfers.	Strongly supports proposed approach to expand dynamic transfers to variable resources, essential in meeting renewable energy goals.	Supports ISO objectives. Dynamic transfer of intermittent resources supports requirements for renewable resources.
Transmission Reservation	Supports proposal.	No comments	Supports proposal's assurance of reliability, information for congestion management, and settlement mechanism. Transmission reservation creates risks for market performance, which need monitoring and possibly mitigation.
Scheduling Updates and Forecasting	Supports proposed options.	No comments	Supports proposed availability and interaction of scheduling options, but need more detail.
Dispatchability Requirements and Curtailment Rules	Supports proposal. The term "operating order" should be clearly defined.	Supports proposal.	Supports proposal to require dynamic transfers to decrease output as ISO instructs. Agrees with dispatching to fill unused capacity, but risks need to be monitored.
Locational Pricing	Supports proposal.	No comments	Supports proposal.
Pro-rata Allocation of Deviations between Balancing Authorities	Supports proposal.	No comments	Supports proposal.
Aggregation of Conventional and/or Renewable Resources	Supports proposal.	Supports proposal.	Supports proposal.
Generator-Only Balancing Authorities	Supports proposal.	No comments	No comments
Dynamic Exports	No comments	No comments	Supports proposal.
Layoffs from Pseudo-ties	Supports proposal.	No comments	Would be concerned if layoffs impose firming and shaping costs on ISO.
Multiple Dynamic Schedules	No comments	No comments	Supports proposal.
Non-firm Transmission	No comments	No comments	Supports proposal.
Documentation for Ancillary Service Certification	No comments	No comments	No comments
Other Issues	Supports ISO's congestion management as well-understood and market-based. Administrative allocation to manage requests for dynamic transfers is not needed.  All dynamic transfers should qualify for resource adequacy based on intertie import capability.	Supports GE study as solid technical assessment, concluding no limit is needed on dynamic transfers.  Supports proposal to not limit requests for dynamic transfers. Developing eligibility criteria would be contentious.  Further explanation of resource adequacy eligibility for dynamic transfer resources would be helpful.	Study showed no operational limits on dynamic transfers. Differences with other studies should be explored.  Advocates interim dynamic transfer limit. Supports publish enrollment.  Efficient intertie use requires cooperation with neighboring entities.

Attachment A: Dynamic Transfers: Stakeholder Matrix

	Powerex	Southern California Edison	Sempra Generation
Overall Proposal	Request extending stakeholder process.	Majority of proposal is well developed and provides required flexibility. Proposal will be basis for efficient, market based utilization of interties.	No comments
Transmission Reservation	Transmission reservation must reflect maximum delivery for compliance with WECC standards. Allocation of transmission reservations should use market mechanism, and promote efficient use of intertie capacity.	Supports proposal.	No comments
Scheduling Updates and Forecasting	No comments	Supports proposal, which will provide incentives for forecasting and be useful for ramping.	Supports proposed requirements for data to support forecasting.
Dispatchability Requirements and Curtailment Rules	Supports proposal.	Supports proposal to base compliance on operating orders.	Supports proposal to base compliance on operating orders.
Locational Pricing	ISO should not price based on location.	Supports proposal. ISO Market Monitoring should follow prices and report any anomalies.	No comments
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	Supports proposal.	No comments
Aggregation of Conventional and/or Renewable Resources	Supports aggregation, but ISO should not limit aggregations based on location.	Supports proposal.	No comments
Generator-Only Balancing Authorities	Generation-only balancing authorities should be treated equally.	Supports proposal.	No comments
Dynamic Exports	No comments	Supports further study as proposed.	No comments
Layoffs from Pseudo-ties	Supports proposal.	Supports proposal.	No comments
Multiple Dynamic Schedules	No comments	Supports proposal.	No comments
Non-firm Transmission	No comments	Neutral.	No comments
Documentation for Ancillary Service Certification	CAISO is not acquiring sufficient operating reserves to integrate intermittent energy. Supports testing and verification proposal.	Supports proposal.	No comments
Other Issues	The ISO should work with Pacific Northwest organizations to coordinate dynamic transfer capability studies. Supports proposal to not restrict dynamic transfer agreements to intertie capacity. Resources that meet tariff and technical requirements can make economic decisions to participate through congestion management.	Supports GE study results. ISO should continue balancing administration & market forces. Supports conclusion of no limits on dynamic transfers beyond intertie capacity, but monitor impacts and publish enrollments. Encourages involvement in Joint Initiatives' Dynamic Scheduling System and intra-hour scheduling, and alignment of bid submittal.	Supports proposed allocation of intertie capacity using ISO congestion management.

Attachment A: Dynamic Transfers: Stakeholder Matrix

	Six Cities (Anaheim, Azusa, Banning, Colton, Pasadena, Riverside)	Sacramento Municipal Utilities District	Transmission Agency of Northern California
Overall Proposal	Generally supports the proposal's concepts. Facilitating dynamic transfers is essential for renewable portfolio standards compliance.	Dynamic transfer has strong regional interest. Supports proposed treatment of pseudo-ties and underlying dynamic transfer policy.	Generally supports this initiative to integrate renewable resources.
Transmission Reservation	Need more detail concerning implementation	ISO should not allow dynamic transfers to encroach on transmission rights of non-ISO entities.	No comments
Scheduling Updates and Forecasting	Supports proposal to allow schedule updates, as proposed.	No comments	No comments
Dispatchability Requirements and Curtailment Rules	Supports proposal.	No comments	No comments
Locational Pricing	No comments	Requested clarification of required data.	No comments
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	No comments	No comments
Aggregation of Conventional and/or Renewable Resources	No comments	No comments	No comments
Generator-Only Balancing Authorities	No comments	No comments	No comments
Dynamic Exports	No comments	Supports proposal.	No comments
Layoffs from Pseudo-ties	No comments	Supports proposal to place treatment of existing pseudo-ties into tariff.	No comments
Multiple Dynamic Schedules	No comments	No comments	No comments
Non-firm Transmission	No comments	No comments	No comments
Documentation for Ancillary Service Certification	No comments	No comments	No comments
Other Issues	<p>ISO should take the lead in coordination with neighboring balancing authorities to avoid inconsistencies, inefficiencies, or delays.</p> <p>Support proposal to apply existing method of import capacity allocation.</p>	<p>The study conclusions on impacts of dynamic transfers on interties are generally consistent with expectations. Further study useful.</p> <p>Dynamic transfer has strong regional interest (shown by joint development of the Dynamic Scheduling System), as well as operational implications. Coordination is needed to avoid impacts on neighbors.</p>	<p>Additional analyses would be useful. The ISO should work closely with neighboring balancing authorities and others on further planning and operation studies.</p> <p>ISO should continue to coordinate with neighbors and not violate intertie agreements.</p>

Attachment A: Dynamic Transfers: Stakeholder Matrix

	Western Power Trading Forum	Xcel Energy	ZGlobal Energy
Overall Proposal	Ability to accommodate dynamic imports and exports is important for renewable energy development for California and entire WECC.	Supports ISO's development of dynamic transfer capabilities.	No comments
Transmission Reservation	Reserving capacity for maximum delivery could lead to inefficient use of transmission and is unnecessary. Real-time delivery can be managed by congestion management and be subject to curtailment.	No comments	No comments
Scheduling Updates and Forecasting	Supports proposal to allow variable resources to update forecasts of availability. Price responsive load and electric vehicles may benefit from similar flexibility.	No comments	No comments
Dispatchability Requirements and Curtailment Rules	No comments	No comments	No comments
Locational Pricing	No comments	No comments	No comments
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	No comments	No comments
Aggregation of Conventional and/or Renewable Resources	No comments	No comments	No comments
Generator-Only Balancing Authorities	No comments	No comments	No comments
Dynamic Exports	No comments	No comments	No comments
Layoffs from Pseudo-ties	No comments	No comments	No comments
Multiple Dynamic Schedules	No comments	No comments	No comments
Non-firm Transmission	Like firm transmission, resources using non-firm transmission can also deliver energy through real-time dispatch.	No comments	No comments
Documentation for Ancillary Service Certification	No comments	No comments	No comments
Other Issues	Supports conclusion that technical factors do not limit dynamic transfers into the ISO. Available capacity will also depend on arrangements with neighboring balancing authorities.  Supports market-based methods for distributing dynamic transfer.	Supports proposal to apply consistent dispatch principles within ISO and to dynamic transfers, and to account for limitations through clear entry qualifications and established congestion management. ISO should not limit or pre-allocate capability.	Resource owners should be able to execute dynamic scheduling agreements, as well as scheduling coordinators.

Attachment A: Dynamic Transfers: Stakeholder Matrix

	8Minutenergy	Management Response
Overall Proposal	Strongly support ISO's initiative. Dynamic transfers will be essential for meeting renewable portfolio standards.	Even though most stakeholders advocate a change in some area, there is broad support for adopting the proposal.
Transmission Reservation	ISO should manage transmission capacity as is done within ISO. Transmission reservations for dynamic transfers impose unnecessary requirements that do not apply to resources within ISO.	NERC and WECC standards establish transmission reservations on interties as part of scheduling dynamic transfers, but not within ISO. Existing tariff sets transmission reservations equal to energy schedules, which may leave no room for renewable resources' variation in output. WECC standard states transmission reservation should be the expected maximum delivery, but does not prevent actual energy delivery from exceeding transmission reservation.
Scheduling Updates and Forecasting	Support proposed ability to dispatch variable resources based on current delivery.	Management proposes two options to support different market participant needs: dispatching at current delivery to simply track generators' variable output, or dispatching from resource's forecast to reflect factors including firming & shaping by external resources.
Dispatchability Requirements and Curtailment Rules	Supports proposal.	Proposal ensures decremental dispatch capability. Proposal can also maximize transmission use if dispatchable bids are available. Tariff filing will consider whether to clarify tariff's existing definition of "operating order".
Locational Pricing	No comments	Locational pricing is a foundation of ISO's market design, to reflect value to ISO system, and is existing practice. Data for external balancing authorities is obtained from WECC's existing network model, and resource data is obtained from resource owner. ISO constantly monitors market outcomes.
Pro-rata Allocation of Deviations between Balancing Authorities	No comments	Pro-rata allocation of deviations is existing contract-by-contract practice, and will be placed in tariff.
Aggregation of Conventional and/or Renewable Resources	No comments	Limiting aggregations to locations with similar impacts on ISO system is necessary for accurate congestion management within ISO.
Generator-Only Balancing Authorities	No comments	Management's proposal is to evaluate dynamic transfers from generation-only balancing authorities on the same basis as other dynamic transfers.
Dynamic Exports	No comments	Based on successful experience through New Melones pseudo-tie pilot, Management proposes to place dynamic exports in tariff. ISO does not have experience with dynamic transfer of loads, and would limit this to pilots, to gain experience.
Layoffs from Pseudo-ties	No comments	Based on successful experience through Sutter pseudo-tie pilot, Management proposes to place pseudo-tie imports in tariff. Management will monitor market results and propose changes if needed.
Multiple Dynamic Schedules	Supports proposal.	This proposal results from a stakeholder request.
Non-firm Transmission	No comments	Management proposes to allow non-firm transmission due to uncertainty of day-ahead forecasting of intermittent resources and potential that firm transmission would be unavailable after day-ahead.
Documentation for Ancillary Service Certification	No comments	ISO procures reserves in accordance with NERC and WECC standards, and operational requirements if these are more stringent. If standards change, ISO will continue to meet the revised standards.
Other Issues	Supports GE study's conclusion that ISO system can manage variation of dynamic transfers' delivery.  No need to delay dynamic transfer implementation due to operational concerns.	Management briefed WECC committees and neighboring areas that would host intermittent dynamic transfers on study of ISO's dynamic transfer capability, and participates in Northwest's Dynamic Transfer Capability Task Force.  Given GE study's conclusion that ISO does not need to limit intermittent dynamic transfers, existing congestion management is sufficient to manage requests for dynamic transfers. Establishing queuing mechanisms would be complex. ISO will monitor market and impose moratorium if needed.  The ISO coordinates with other entities through WECC committees and individually, and considers opportunities to align business systems.  Resource adequacy was discussed further on 4/8/2011 and aligns qualifying capacity with internal renewable resources.