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June 30, 2003

The Honorable Magalie R. Salas  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Re: California Independent System Operator Corporation  
Compliance Filing  
Docket No. ER03-683-\_\_\_**

Dear Secretary Salas:

The California Independent System Operator Corporation ("ISO")<sup>1</sup> respectfully submits six copies of this filing in compliance with the Commission's May 30, 2003 order in the captioned docket concerning Amendment No. 50 to the ISO Tariff, 103 FERC ¶ 61,265 ("Amendment No. 50 Order"). The Commission directed the ISO to comply with the Amendment No. 50 Order as described below.

**Methodologies for Intra-Zonal Congestion Management with Regard to Incremental Bids and with Regard to Decremental Bids**

The Commission directed that for Intra-Zonal Congestion Management with regard to decremental bids *only*, the ISO should use reference prices (rather than cost-based proxy bids) established by the independent entity that determines the reference prices for the Automatic Mitigation Procedure ("AMP"). The Commission further directed that such decremental reference prices be applied to all generators, both thermal and non-thermal. Amendment No. 50

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<sup>1</sup> Capitalized terms not otherwise defined herein are used in the sense given in the Master Definitions Supplement, Appendix A to the ISO Tariff.

Order at PP 40-41, 54. Because these changes are to apply to decremental bids only, the ISO understands the Commission to mean that, with regard to incremental bids, the ISO should continue to use its current methodology for Intra-Zonal Congestion Management.

To comply with these Commission directives, the ISO has:

- Modified Section 2.5.22.8 to refer to Sections 7.2.6.1 and 7.2.6.2, which describe how the ISO will handle decremental and incremental dispatch to manage Intra-Zonal Congestion, respectively;
- Modified Section 7.2.4.1.4 to indicate that the ISO will continue to use Adjustment Bids from Generating Units to manage Intra-Zonal Congestion if the Generating Unit's output must be increased;
- Modified Section 7.2.6.1 to apply only to decremental dispatch to manage Intra-Zonal Congestion, incorporate the use of decremental reference prices, and include the language directed by the Commission regarding certain types of Generation (as further described below);
- Modified Section 7.2.6.2 to apply only to incremental dispatch, restoring the existing practices and noting that Section 7.2.6.1 applies to decremental dispatch;
- Modified Appendix F, Schedule 2 to refer to Sections 7.2.6.1 and 7.2.6.2;
- Modified Dispatch Protocol Section 8.6.2, item (f), to clarify that the ISO will continue to use bids in the merit order stack to increase Generating Units' output to manage Intra-Zonal Congestion;
- Restoring Schedules and Bids Protocol Section 2.1.1, item (g), to continue to allow the ISO to use Adjustment Bids for incremental dispatch to manage Intra-Zonal Congestion;
- Modifying Schedules and Bids Protocol Section 4 to clarify that Adjustment Bids can still be used for incremental dispatch to manage Intra-Zonal Congestion;
- Modifying Scheduling Protocol Section 10.1, item (a), to eliminate a

reference to Section 2.2.10.7, which the ISO has removed (as described further below) to comply with the directive in the Amendment No. 50 Order not to publish transfer limits in advance;

- Modified Scheduling Protocol Section 11.3, item (f), to clarify that the ISO will continue to use bids in the merit order stack to increase Generating Units' output to manage Intra-Zonal Congestion;
- Restored Settlement and Billing Protocol Appendix B, Section 2.1, to its pre-Amendment No. 50 state to indicate how resources incremented to manage Intra-Zonal Congestion will be compensated. However, since the ISO manages Intra-Zonal Congestion in the real-time market, after Final Hour-Ahead Schedules are established, this section now uses the more accurate word "Dispatched" instead of "rescheduled," as provided for in Amendment No. 50;
- Restored Settlement and Billing Protocol Appendix B, Section 2.1.1 to its pre-Amendment No. 50 state;
- Modified Settlement and Billing Protocol Appendix B, Sections 2.2 and 2.2.1, to clarify that Generating Units Dispatched to manage Intra-Zonal Congestion will be decremented according to their decremental reference prices, while System Resources will be decremented according to their Adjustment Bids or Imbalance Energy bids. Since the ISO manages Intra-Zonal Congestion in the real-time market, after Final Hour-Ahead Schedules are established, Section 2.2 therein now uses the more accurate word "Dispatched" instead of "rescheduled," as provided for in Amendment No. 50;
- Restored Settlement and Billing Protocol Appendix B, Sections 3.1, 3.2, and 3.3 to their pre-Amendment No. 50 state. While the ISO will not generate proxy bids for incrementally Dispatching units to manage Intra-Zonal Congestion, the ISO retains the phrase "or generated by the ISO" in Section 3.2 therein because the ISO could Dispatch a unit to manage Intra-Zonal Congestion using a proxy bid generated for a unit that had failed to comply with the Must-Offer Obligation;
- Modified Settlement and Billing Protocol Appendix B, Sections 3.5 and 3.6, to provide that Generating Units Dispatched to manage Intra-Zonal

Congestion will be decremented according to their decremental reference prices, while System Resources will be decremented according to their Adjustment Bids or Imbalance Energy bids; and

- Modified Settlement and Billing Protocol Appendix B, Section 3.7, to state that the formula defined in the section means the amount by which a Generating Unit or System Resource is decreased by the ISO within a relevant block of Energy at the decremental reference price for the Generating Unit or of the Adjustment Bid curve (or Imbalance Energy bid) for the System Resource.
- Modified Settlement and Billing Protocol Appendix D, Sections 3.6.3 and 3.15.2, to refer to Sections 7.2.6.1 and 7.2.6.2.

#### Removal of Provision Concerning Publication of Generating Limits

The Commission directed the ISO to remove the provision in Section 2.2.10.7 concerning publication of generating limits. See Amendment No. 50 Order at P 48. The ISO now removes this provision.

#### Procedure to Be Utilized by the ISO in Dispatching Generating Units

The Commission directed the ISO to “further explain the procedure it intends to utilize in dispatching generating units in dealing with congestion.” Amendment No. 50 Order at P 59. To comply with this directive, ISO Operating Procedure M-401, which describes how the ISO will dispatch generating units to manage Intra-Zonal Congestion, is provided in Attachment C to the present filing. ISO Operating Procedure M-401 has been updated in accordance with the Amendment No. 50 Order.

#### Addition of Language to Section 7.2.6.1

The Commission directed the ISO to add to Section 7.2.6.1 certain language that the ISO had committed, in its answer concerning Amendment No. 50, to add to the section. Amendment No. 50 Order at PP 62-63. The ISO now adds this language to Section 7.2.6.1.

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June 30, 2003  
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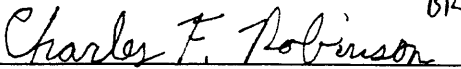
Removal of Language from Section 20.3.4(c)

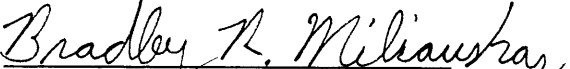
The Commission directed the ISO to revise proposed Section 20.3.4(c) to remove the phrase "and other entities" from the section. See Amendment No. 50 Order at P 68. The ISO now removes the phrase from the section.

The changes described above are contained in the revised Tariff sheets provided in Attachment A to the present filing, and these changes are shown in black-line format in Attachment B to the present filing. As described above, Attachment C to the present filing contains ISO Operating Procedure M-401. The present filing also includes, in Attachment D, a form notice of filing suitable for publication in the Federal Register, as well as a computer diskette containing the notice in WordPerfect format.

Two additional copies of this filing are enclosed to be date-stamped and returned to our messenger. If there are questions concerning this filing, please contact the undersigned.

Respectfully submitted,

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**ATTACHMENT A**

changes to the Suggested Adjusted Schedules, all of the Suggested Adjusted Schedules shall become the Final Schedules. The Final Schedules shall serve as the basis for Settlement between the ISO and each Scheduling Coordinator.

**2.2.9 [Not Used]**

**2.2.10 Information to be Provided by the ISO to all Scheduling Coordinators.**

By 6:00 p.m. two days prior to a Trading Day, the ISO shall publish on WEnet information, including the following to all Scheduling Coordinators for each Settlement Period of the Trading Day:

**2.2.10.1 Scheduled Line Outages.** Scheduled transmission line Outages;

**2.2.10.2 [Not Used]**

**2.2.10.3 Forecast Loop-Flow.** Forecast Loop Flow over ISO Inter-zonal Interfaces and Scheduling Points;

**2.2.10.4 Advisory Demand Forecasts.** Advisory Demand Forecasts by location;

**2.2.10.5 Updated Transmission Loss Factors.** Updated Generation Meter Multipliers reflecting Transmission Losses to be supplied by each Generating Unit and by each import into the ISO Control Area;

**2.2.10.6 Ancillary Services.** Expected Ancillary Services requirement by reference to Zones for each of the reserve Ancillary Services.

**2.2.10.7 [Not Used]**

**2.2.10.8 [Not Used]**

**2.5.22.7 Inter-Zonal Congestion.** In the event of Inter-Zonal Congestion in real time, the ISO shall procure Imbalance Energy separately for each Zone, as described in Section 2.5.22.6.

**2.5.22.8 Intra-Zonal Congestion.** Except as provided in Section 5.2, in the event of Intra-Zonal Congestion in real time, the ISO shall adjust resources in accordance with Sections 7.2.6.1 and 7.2.6.2.

**2.5.22.9 Replacement of Operating Reserve.** If pre-arranged Operating Reserve is used to meet Imbalance Energy requirements, such Operating Reserve may be replaced by the ISO's dispatch of additional Imbalance Energy through available Supplemental Energy Bids.

Any additional Operating Reserve needs may also be met in the same way. Where the ISO elects to rely upon Supplemental Energy Bids, the ISO shall select the resources with the lowest incremental Energy price bids. Operating Reserve procured from Replacement Reserve shall not require replacement of utilized Replacement Reserve.

**2.5.22.10 Dispatch Instructions.**

All Dispatch instructions except those for the Dispatch of Regulation (which will be communicated by direct digital control signals to Generating Units and, for System Resources, through dedicated communication links which satisfy the ISO's standards for external imports of Regulation) will be communicated electronically, except that, at the ISO's discretion, Dispatch instructions may be communicated by telephone, or fax. Except in the case of deteriorating system conditions or emergency, and except for instructions for the Dispatch of Regulation, the ISO will send all Dispatch instructions to the Scheduling Coordinator for the Generating Unit, System Unit, Load or System Resource, which it



**7.2.4.1.2** The Adjustment Bids will be used by the ISO to determine the marginal value associated with each Congested Inter-Zonal Interface.

**7.2.4.1.3 [Not used]**

**7.2.4.1.4** The ISO shall also use incremental Adjustment Bids from Generating Units and Adjustment Bids from other resources in the ISO's real time system operation for Intra-Zonal Congestion Management and to decrement Generation in order to accommodate Overgeneration conditions, including Reliability Must-Run Generation which the ISO requests under Reliability Must-Run Contracts.

**7.2.4.1.5** To facilitate trades amongst Scheduling Coordinators, the ISO will develop procedures to publish Adjustment Bids of those Scheduling Coordinators who authorize the publication of their identity and/or Adjustment Bids. Scheduling Coordinators will then be able to utilize this information to conduct trades to aid Congestion Management.

**7.2.4.2 Submission of Adjustment Bids.**

**7.2.4.2.1** Each Scheduling Coordinator is required to submit a preferred operating point for each of its resources. However, a Scheduling Coordinator is not required to submit an Adjustment Bid for a resource.

**7.2.4.2.2** The minimum MW output level specified for a resource, which may be zero MW, and the maximum MW output level specified for a resource must be physically realizable by the resource.

**7.2.4.2.3** The Scheduling Coordinator's preferred operating point for each resource must be within the range of the Adjustment Bids.

**7.2.4.2.4** Adjustment Bids can be revised by Scheduling Coordinators after the Day-Ahead Market has closed for consideration in the Hour-Ahead Market and, after the Hour-

**7.2.5.2.7** If inadequate Adjustment Bids have been submitted to schedule Inter-Zonal Interface capacity on an economic basis and to the extent that scheduling decisions cannot be made on the basis of economic value, the ISO will allocate the available Inter-Zonal Interface capacity to Scheduling Coordinators in proportion to their respective proposed use of that capacity as indicated in their Schedules and shall curtail scheduled Generation and Demand to the extent necessary to ensure that each Scheduling Coordinator's Schedule remains balanced.

**7.2.5.2.8** The ISO will publish information prior to the Day-Ahead Market, between the iterations of the Day-Ahead Market, and prior to the Hour-Ahead Market, to assist the Scheduling Coordinators to construct their Adjustment Bids so as to actively participate in the management of Congestion and the valuation of Inter-Zonal Interfaces. This information may include the ISO's most-current information regarding: potentially Congested paths, projected transmission uses, projected hourly Loop Flows across Inter-Zonal Interfaces, scheduled line Outages, forecasts of expected system-wide Load, the ISO's Ancillary Services requirements, Generation Meter Multipliers, and power flow outputs.

**7.2.5.2.8** The ISO will also publish information, once it is available, regarding tentative prices for the use of Inter-Zonal Interfaces, and Generation shift factors for the use of Inter-Zonal Interfaces, which indicate the relative effectiveness of Generation shifts in alleviating Congestion.

## **7.2.6 Intra-Zonal Congestion Management.**

**7.2.6.1 Decremental Bids.** With regard to decremental bids, if Final Hour-Ahead Schedules cause Congestion on the Intra-Zonal interface, the ISO shall, after Dispatching available and effective Reliability Must-Run Units to manage the Congestion, apply the decremental reference prices determined by the independent entity that determines the reference prices for the Automatic Mitigation Procedure (AMP) as described in Appendix A to the Market Monitoring and Information Protocol. The ISO shall Dispatch Generating Units

according to the decremental reference prices thus established, the resource's effectiveness on the Congestion, and other relevant factors such as Energy limitations, existing contractual restrictions, and Regulatory Must-Run or Regulatory Must-Take status, to alleviate the Congestion after Final Hour-Ahead Schedules are issued. Where the ISO must reduce a Generating Unit's output, the ISO shall Dispatch Generating Units according to the decremental reference prices and not according to Adjustment Bids or Supplemental Energy Bids to alleviate Intra-Zonal Congestion. No Generating Unit shall be Dispatched below its minimum operating level or above its maximum operating level. No Reliability Must-Run Unit shall be Dispatched below the operating level determined by the ISO as necessary to maintain reliability. If Congestion still exists after all Generating Units are Dispatched to their minimum operating levels, the ISO shall instruct Generating Units to shut off in merit order based on their decremental reference prices at minimum load, beginning with the most expensive unit. The ISO shall apply the decremental reference prices to thermal Generating Units and to non-thermal Generating Units.

If the ISO Dispatches System Resources or Dispatchable Loads to alleviate Intra-Zonal Congestion, the ISO shall Dispatch those resources in merit order according to the resource's Day-Ahead or Hour-Ahead Adjustment Bid or Imbalance Energy bid.

The ISO shall only redispach Regulatory Must-Take or Regulatory Must-Run Generation, Intermittent Resources, or Qualifying Facilities to manage Intra-Zonal Congestion after redispaching all other available and effective generating resources, including Reliability Must-Run Units.

**7.2.6.1.1 [Not used]**

**7.2.6.1.2 [Not Used]**

**7.2.6.1.3 [Not Used]**

**7.2.6.1.4 [Not Used]**

**7.2.6.1.5 [Not Used]**

**7.2.6.1.6 [Not Used]**

**7.2.6.2 Incremental Bids.** With regard to incremental bids, except as provided in Sections 5.2, 7.2.6.1 and 11.2.4.2, the ISO will perform Intra-Zonal Congestion Management in real time using available Adjustment Bids and Imbalance Energy bids, based on their effectiveness and in merit order, to minimize the cost of alleviating Congestion. In the event no Adjustment Bids or Imbalance Energy bids are available, the ISO will exercise its authority to direct the redispatch of resources as allowed under the Tariff, including Section 2.4.2 and 2.4.4.

**7.2.6.3 Cost of Intra-Zonal Congestion Management.** The net of the amounts paid by the ISO to the Scheduling Coordinators and the amounts charged to the Scheduling Coordinators will be calculated and charged to all Scheduling Coordinators through a Grid Operations Charge, as described in Section 7.3.2.

**7.2.7 Creation, Modification and Elimination of Zones.**

**7.2.7.1 Active Zones.** The Active Zones are as set forth in Appendix I to this ISO Tariff.

**7.2.7.2 Modifying Zones.** The ISO shall monitor usage of the ISO Controlled Grid to determine whether new Zones should be created, or whether existing Zones should be eliminated, in accordance with the following procedures.

**7.2.7.2.1** If over a 12-month period, the ISO finds that within a Zone the cost to alleviate the Congestion on a path is equivalent to at least 5 percent of the product of the rated capacity of the path and the weighted average High Voltage Access Charge and Low

law. The ISO shall cooperate with the affected Market Participant to obtain proprietary or confidential treatment of confidential information by the person to whom such information is disclosed prior to any such disclosure.

- (c) In order to maintain reliable operation of the ISO Control Area, the ISO may share individual Generating Unit Outage information with the operations engineering and/or the outage coordination division(s) of other Control Area operators, Participating TOs, MSS Operators engaged in the operation and maintenance of the electric supply system whose system is significantly affected by the Generating Unit and who have executed the Western Electricity Coordinating Council Confidentiality Agreement for Electric System Data.

#### **20.4 Staffing and Training To Meet Obligations.**

The ISO shall engage sufficient staff to perform its obligations under this ISO Tariff in a satisfactory manner consistent with Good Utility Practice. The ISO shall make its own arrangements for the engagement of all staff and labor necessary to perform its obligations hereunder and for their payment. The ISO shall employ (or cause to be employed) only persons who are appropriately qualified, skilled and experienced in their respective trades or occupations. ISO employees and contractors shall abide by the ISO Code of Conduct for employees contained in the ISO bylaws and approved by FERC.

#### **20.5 Accounts and Reports.**

The ISO shall notify Market Participants of any significant change in the accounting treatment or methodology of any costs or any change in the accounting procedures, which is expected to result in a significant cost increase to any Market Participant. Such notice shall be given at the earliest possible time, but no later than, sixty (60) days before implementation of such change.

### **Imbalance Energy Charges**

Rates for Imbalance Energy will be calculated in accordance with the formula in ISO Tariff Section 11.2.4.1.

### **Replacement Reserve Charge**

The Replacement Reserve Charge will be calculated in accordance with ISO Tariff Sections 2.5.28.4 and 11.2.4.1.

### **Unaccounted for Energy**

Rates for UFE will be calculated in accordance with ISO Tariff Section 11.2.4.1.

### **Transmission Losses Imbalance Charges**

Transmission Losses for each hour will be calculated in accordance with ISO Tariff Sections 7.4.2.

### **Access Charges**

The High Voltage Access Charge and Transition Charge is set forth in ISO Tariff Schedule 3 of Appendix F. The Low Voltage Access Charge of each Participating TO is set forth in that Participating TO's TO Tariff or comparable document.

### **Usage Charges**

The amount payable by Scheduling Coordinators is determined in accordance with ISO Tariff Section 7.3.1.4.1. Usage Charges will be calculated in accordance with ISO Tariff Section 7.3.1.

### **Default Usage Charge**

The Default Usage Charge will be used in accordance with ISO Tariff Section 7.3.1.3.

### **Grid Operations Charge for Intra-Zonal Congestion**

Intra-Zonal Congestion during the initial period of operation will be managed in accordance with ISO Tariff Sections 7.2.6.1 and 7.2.6.2.

### **Wheeling Access Charges**

The Wheeling Access Charge for transmission service is set forth in Section 7.1.4.1 of the ISO Tariff and Appendix II of the TO Tariffs.

### **Charge for Failure to Conform to Dispatch Instructions**

The Charge for Failure to Conform to Dispatch Instructions will be determined in accordance with ISO Tariff Section 2.5.22.11.

### **Reliability Must-Run Charge**

The Reliability Must-Run Charge will be determined in accordance with ISO Tariff Section 5.2.7.

### **FERC Annual Charge Recovery Rate**

The FERC Annual Charge Recovery Rate will be determined in accordance with ISO Tariff Section 7.5.

- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time.

**DP 8.6.3 Basis for Real Time Dispatch**

The ISO shall base real time Dispatch of Generating Units, Curtailable Demands and Interconnection schedules on the following principles:

- (a) the ISO shall dispatch Generating Units and dispatchable Interconnection schedules providing Regulation service to meet WSCC and NERC Area Control Error (ACE) performance criteria;
- (b) in each BEEP Interval, following the loss of a resource and once ACE has returned to zero, the ISO shall determine if the Regulation Generating Units and dispatchable Interconnection schedules are operating at a point away from their Set Point. The ISO shall then adjust the output of Generating Units, Curtailable Demands, and dispatchable Interconnection schedules (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve, or Supplemental Energy) to return the Regulation Generating Units and dispatchable Interconnection schedules to their Set Points to restore their full regulating margin;
- (c) in each BEEP Interval, the ISO shall dispatch Generating Units, Curtailable Demands and dispatchable Interconnection schedules to meet its balancing Energy requirements and eliminate any Price Overlap between decremental and incremental Energy Bids, thereby, dispatching the relevant resources in real time for economic trades either between SCs or within a SC's portfolio;
- (d) the ISO shall select the Generating Units, Curtailable Demands and dispatchable Interconnection schedules to be dispatched to meet its balancing Energy requirements based on the merit order stack of Energy bid prices produced by BEEP;
- (e) the ISO shall not discriminate between Generating Units, Curtailable Demands and dispatchable Interconnection schedules other than based on price, and the effectiveness (location and ramp rate) of the resource concerned to respond to the fluctuation in Demand or Generation;
- (f) Generating Units, Curtailable Demands or dispatchable Interconnection schedules shall be dispatched during the Settlement Period only until the next variation in Generation or Demand or the end of the Settlement Period, whichever is sooner. In dispatching such resources, the ISO is not making any commitment beyond the Settlement Period, as to the duration of their operation, nor the level of their output or Demand;
- (g) The ISO will not differentiate between Ancillary Services procured by the ISO and Ancillary Services which are being self-provided;

- (c) The captions and headings in this Protocol are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Protocol.
- (d) This Protocol shall be effective as of the ISO Operations Date.
- (e) References to time are references to the prevailing Pacific Time.

**SBP 1.3 Scope**

**SBP 1.3.1 Scope of Application to Parties**

The SBP applies to the following entities:

- (a) Scheduling Coordinators (SCs);
- (b) Participating Transmission Owners (PTOs); and
- (c) the Independent System Operator (ISO).

**SBP 1.3.2 Liability of the ISO**

Any liability of the ISO arising out of or in relation to this Protocol shall be subject to Section 14 of the ISO Tariff as if references to the ISO Tariff were references to this Protocol.

**SBP 2 SCHEDULES AND NOTIFICATIONS**

**SBP 2.1 Contents of Schedules and Adjustment Bid Data**

SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Schedules and bid. Except as noted, each of the following data sections can be submitted up to seven (7) days in advance.

**SBP 2.1.1 Generation Section of a Balanced Schedule and Adjustment Bid Data**

The Generation section of a Balanced Schedule will include the following information for each Generating Unit:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) name of Generating Unit scheduled;
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) priority type, if applicable, to the Settlement Period (use OTHER if scheduling the use of Existing Contract rights or RLB\_MUST\_RUN) for Reliability Must-Run Generation;
- (f) contract reference number for Reliability Must-Run Generation;
- (g) Congestion Management flag – "Yes" indicates that any Adjustment Bid submitted under item (k) below should be used;



cannot be found in the ISO's scheduling applications table of contract reference numbers), the scheduled use will be invalidated and the SC notified by the ISO's issuance of an invalidated usage information template.

**SBP 4 ADJUSTMENT BIDS**

Adjustment Bids will be used by the ISO for Inter-Zonal Congestion Management as described in the SP and are initially valid only for the markets into which they are bid, being the Day-Ahead Market or the Hour-Ahead Market. These Adjustment Bids will not be transformed into Supplemental Energy bids. However, these Adjustment Bids are treated as standing offers to the ISO and may be used by the ISO in the Real Time Market for the purpose of managing Intra-Zonal Congestion using System Resources, Dispatchable Loads and increasing Generating Units' output and for managing Overgeneration conditions.

**SBP 4.1 Content of Adjustment Bids**

Adjustment Bids are contained in Preferred Schedules and Revised Schedules submitted by SCs for particular Generating Units (including Physical Scheduling Plants), Dispatchable Loads, external imports/exports, and Generating Units and Dispatchable Loads supporting Inter-Scheduling Coordinator Energy Trades.

Each SC is required to submit a preferred operating point for each Generating Unit, Dispatchable Load and external import/export (these quantities are presented in the SC's submitted Schedule as "Hourly MWh"). The SC's preferred operating point for each Generating Unit, Dispatchable Load and external import/export must be within the range of any Adjustment Bids to be used by the ISO. The minimum MW output level, which may be zero MW (or negative for pumped storage resources), and the maximum MW output level must be physically achievable.

**SBP 4.2 Format of Adjustment Bids**

Adjustment Bids will be presented in the form of a monotonically non-decreasing staircase function for Generating Units and external imports. Adjustment Bids will be presented in the form of a monotonically non-increasing staircase function for Dispatchable Loads and external exports. These staircase functions will be composed of up to eleven (11) ordered pairs (i.e., ten (10) steps or price bands) of quantity/price information. Adjustment Bids are submitted as an integral part of the SC's Balanced Schedule and must be related to each Generating Unit, Dispatchable Load and external import/export. SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Adjustment Bids.

arrangements or its Transmission Owner's Tariff. The ISO will not undertake the settlement or billing of any such differences under any Existing Contract.

**SP 10 DAY/HOUR-AHEAD INTER-ZONAL CONGESTION MANAGEMENT**

**SP 10.1 Congestion Management Assumptions**

The Inter-Zonal Congestion Management process is based upon the following assumptions:

- (a) Inter-Zonal Congestion Management will ignore Intra-Zonal Congestion. Intra-Zonal Congestion will be managed in accordance with Tariff Section 7.2.6;
- (b) Inter-Zonal Congestion Management will use a DC optimal power flow (OPF) program that uses linear optimization techniques with active power (MW) controls only; and
- (c) transmission capacity reserved under Existing Contracts will not be subject to the ISO's Congestion Management procedures.

**SP 10.2 Congestion Management Process**

- (a) Inter-Zonal Congestion Management will involve adjusting Schedules to remove potential violations of Inter-Zonal Interface constraints, minimizing the redispatch cost, as determined by the submitted Adjustment Bids that accompany the submitted Schedules. See the SBP for a general description of the use of Adjustment Bids to establish priorities.
- (b) Inter-Zonal Congestion Management will not involve arranging or modifying trades between SCs. Each SC's portfolio will be kept in balance (i.e., its Generation plus external imports, as adjusted for Transmission Losses, and Inter-Scheduling Coordinator Energy Trades (whether purchases or sales) will still match its Demand plus external exports) after the adjustments. Market Participants will have the opportunity to trade with one another and to revise their Schedules during the first Congestion Management iteration in the Day-Ahead Market, and between the Day-Ahead Market and Hour-Ahead Market.
- (c) Inter-Zonal Congestion Management will also not involve the optimization of SC portfolios within Zones (where such apparently non-optimal Schedules are submitted by SCs). Adjustments to individual SC portfolios within a Zone will be either incremental (i.e., an increase in Generation and external imports and a decrease in Demand and external exports) or decremental (i.e., a decrease in Generation and external imports and an increase in Demand and external exports), but not both.
- (d) If Adjustment Bids are exhausted before Congestion is eliminated, the remaining Schedules will be adjusted *pro rata* except for those uses of transmission service under Existing Contracts, which are curtailed in accordance with SP 7.3 and SP 7.4.

**SP 10.3 Congestion Management Pricing**

- (a) The Adjustment Bids that the SCs submit constitute implicit bids for transmission between Zones on either side of a Congested Inter-Zonal Interface. The ISO's Inter-Zonal

Where, in any BEEP Interval, the highest decremental Energy Bid in the merit order stack is higher than the lowest incremental Energy Bid, the BEEP Software will eliminate the Price Overlap by actually dispatching for all those incremental and decremental bids which fall within the overlap.

References to incremental Energy Bids include references to Demand reduction bids, and for the purpose of applying this algorithm a reduction in Demand shall be treated as an equivalent increase in Generation.

**SP 11.3 Use of the Merit Order Stack**

The merit order stack, as described in SP 11.2, can be used to supply Energy for:

- (a) satisfying needs for Imbalance Energy (differences between actual and scheduled Generation, Demand and external imports/exports) in real time;
- (b) managing Inter-Zonal Congestion in real time;
- (c) supplying Energy necessary to allow resources providing Regulation service to return to the base point of their regulating ranges in real time;
- (d) recovering Operating Reserves utilized in real time;
- (e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and
- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time.

**SP 12 AMENDMENTS TO THE PROTOCOL**

If the ISO determines a need for an amendment to this Protocol, the ISO will follow the requirements as set forth in Section 16 of the ISO Tariff.

**APPENDIX B**

**GRID OPERATIONS CHARGE COMPUTATION**

**B 1 Purpose of charge**

The Grid Operations Charge is a charge which recovers redispatch costs incurred due to Intra-Zonal Congestion pursuant to Section 7.3.2 of the ISO Tariff. The Grid Operations Charge is paid by or charged to Scheduling Coordinators in order for the ISO to recover and properly redistribute the costs of adjusting the Balanced Schedules submitted by Scheduling Coordinators.

**B 2 Fundamental formulae**

**B 2.1 Payments to SCs with incremented schedules**

When it becomes necessary for the ISO to increase the output of a Scheduling Coordinator's Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or reduce a Curtailable Demand<sub>i</sub> in order to relieve Congestion within a Zone, the ISO will pay the Scheduling Coordinator. The amount that ISO pays the Scheduling Coordinator<sub>j</sub> is the price specified in the Scheduling Coordinator's Day-Ahead or Hour-Ahead Adjustment Bid (or Imbalance Energy bid as appropriate) for the Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or Curtailable Demand<sub>i</sub> multiplied by the quantity of Energy Dispatched. The formula for calculating the payment to Scheduling Coordinator<sub>j</sub> for each block<sub>b</sub> of Energy of its Adjustment Bid curve in Trading Interval<sub>t</sub> is:

$$INC_{bijt} = adjinc_{bijt} * \Delta inc_{bijt}$$

**B 2.1.1 Total Payment for Trading Interval**

The formula for calculating payment to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> has been increased or Curtailable Demand<sub>i</sub> reduced for all the relevant blocks<sub>b</sub> of Energy in the Adjustment Bid curve (or Imbalance Energy bid) of that Generating Unit or System Resource or Curtailable Demand in the same Trading Interval<sub>t</sub> is:

$$PayII_{ijt} = \sum_b INC_{bijt}$$

**B 2.2 Charges to Scheduling Coordinators with decremented schedules**

When it becomes necessary for the ISO to decrease the output of a Scheduling Coordinator's Generating Unit<sub>i</sub> or System Resource<sub>i</sub> in order to relieve Congestion within a Zone, the ISO will make a charge to the Scheduling Coordinator. The amount that the ISO will charge Scheduling Coordinator<sub>j</sub> for decreasing the output of Generating Unit<sub>i</sub> is

the decremental reference price specified for the Scheduling Coordinator as determined in accordance with Section 7.2.6.1 multiplied by the quantity of Energy Dispatched. The amount that the ISO will charge Scheduling Coordinator<sub>i</sub> for decreasing the output of System Resource<sub>i</sub> is the price specified in the Scheduling Coordinator's Day-Ahead or Hour-Ahead Adjustment Bid (or Imbalance Energy Bid) for System Resource<sub>i</sub> multiplied by the quantity of Energy Dispatched. The formula for calculating the

charge to Scheduling Coordinator<sub>j</sub> for each block<sub>b</sub> of Energy in its decremental reference price, Adjustment Bid curve, or Imbalance Energy bid in Trading Interval<sub>t</sub> is:

$$DEC_{bijt} = adjdec_{bijt} * \Delta dec_{bijt}$$

**B 2.2.1 Total Charge for Trading Interval**

The formula for calculating the charge to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> has been decreased for all the relevant blocks<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub>, Adjustment Bid curve, or Imbalance Energy bid for System Resource<sub>i</sub> in the same Trading Interval<sub>t</sub> is:

$$ChargeTI_{ijt} = \sum_b DEC_{bijt}$$

**B 2.3 Not Used**

**B 2.4 Net ISO redispatch costs**

The Trading Interval net redispatch cost encountered by ISO to relieve Intra-Zonal Congestion is the sum of the amounts paid by the ISO to those Scheduling Coordinators whose Generation or System Resource was increased or Curtailable Demand was decreased during the Trading Interval less the sum of the amounts received by the ISO from those Scheduling Coordinators whose Generating Units or System Resource were decreased during the Trading Interval. The fundamental formula for calculating the net redispatch cost is:

$$REDISP_{CONGt} = \sum_j PayTI_{ijt} - \sum_j ChargeTI_{ijt}$$

Note that  $REDISP_{CONGt}$  can be either positive or negative. This means that it is possible for the ISO to generate either a net cost or a net income, for any given Trading Interval. In the event the ISO does not make use of equal amounts of incremental and decremental dispatched MWHs, then the net redispatch cost becomes the sum of the amounts paid (or charged) by the ISO to those Scheduling Coordinators whose Generation or System Resource was increased (or decreased) or Curtailable Demand was decreased (or increased) during the Trading Interval less the sum of the amounts received by the ISO from Scheduling Coordinators through the Imbalance Energy Market.

**B 2.5 Grid Operations Price**

The grid operations price is the Trading Interval rate used by the ISO to apportion net Trading Interval redispatch costs to Scheduling Coordinators within the Zone with Intra-Zonal Congestion. The grid operations price is calculated using the following formula:

$$GOP_t = \frac{REDISPCONG_t}{\sum_j QCharge_{jt} + \sum_j Export_{jt}}$$

**B 2.6 Grid Operations Charge**

The Grid Operations Charge is the vehicle by which the ISO recovers the net redispatch costs. It is allocated to each Scheduling Coordinator in proportion to the Scheduling Coordinator's Demand in the Zone with Intra-Zonal Congestion and Exports from the Zone with Intra-Zonal Congestion. The formula for calculating the Grid Operations Charge for Scheduling Coordinator<sub>j</sub> in Trading Interval<sub>t</sub> is:

$$GOC_{jt} = GOP_t * (QCharge_{jt} + EXPORT_{jt})$$

**B 3 Meaning of terms of formulae**

**B 3.1 INC<sub>bijt</sub> - \$**

The payment from the ISO due to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> is increased or Curtailable Load<sub>j</sub> is reduced within a block<sub>b</sub> of Energy in its Adjustment Bid curve (or Imbalance Energy bid) in Trading Interval<sub>t</sub> in order to relieve Intra-Zonal Congestion.

**B 3.2 adjinc<sub>bijt</sub> - \$/MWh**

The incremental cost for the rescheduled Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> taken from the relevant block<sub>b</sub> of Energy in the Day-Ahead or Hour-Ahead Adjustment Bid curve (or Imbalance Energy bid) submitted by the Scheduling Coordinator<sub>j</sub> or generated by the ISO for the Trading Interval<sub>t</sub>.

**B 3.3 Δinc<sub>bijt</sub> - MW**

The amount by which the Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> of Scheduling Coordinator<sub>j</sub> for Trading Interval<sub>t</sub> is increased by the ISO within the relevant block<sub>b</sub> of Energy in its Adjustment Bid curve (or Imbalance Energy bid).

**B 3.4 Pay<sub>TIjt</sub> - \$**

The Trading Interval payment to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> has been increased or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> reduced in Trading Interval<sub>t</sub> of the Trading Day.

**B 3.5 DEC<sub>bijt</sub> - \$**

The charge to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> is decreased for Trading Interval<sub>t</sub> within a block<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub> or in the Adjustment Bid curve (or Imbalance Energy bid) for System Resource<sub>i</sub>.

- B 3.6**            **adjdec<sub>bijt</sub> - \$/MWh**  
The decremental cost for the rescheduled Generating Unit<sub>i</sub> or System Resource<sub>i</sub> taken from the relevant block<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub> or of the Day-Ahead or Hour-Ahead Adjustment Bid curve (or Imbalance Energy bid) for System Resource<sub>i</sub> submitted by Scheduling Coordinator<sub>j</sub> or generated by the ISO for the Trading Interval<sub>t</sub>.
- B 3.7**            **Δdec<sub>bijt</sub> - MW**  
The amount by which the Generating Unit<sub>i</sub> or System Resource<sub>i</sub> of Scheduling Coordinator<sub>j</sub> for Trading Interval<sub>t</sub> is decreased by ISO within the relevant block<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub> or of the Adjustment Bid curve (or Imbalance Energy bid) for System Resource<sub>i</sub>.
- B 3.8**            **ChargeT<sub>lijt</sub> - \$**  
The Trading Interval charge to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> has been decreased in Trading Interval<sub>t</sub> of the Trading Day.
- B 3.9**            **Not Used**
- B 3.10**          **Not Used**
- B 3.10.1**       **Not Used**
- B 3.10.2**       **P<sub>xt</sub> - \$/MWh**  
The zonal Hourly Ex Post Price, for Uninstructed Imbalance Energy, for Trading Interval *t* in Zone *x*.
- B 3.11**          **REDISPCONG<sub>t</sub> - \$**  
The Trading Interval net cost to ISO to redispatch in order to relieve Intra-Zonal Congestion during Trading Interval<sub>t</sub>.
- B 3.12**          **GOP<sub>t</sub> - \$/MWh**  
The Trading Interval grid operations price for Trading Interval<sub>t</sub> used by the ISO to recover the costs of redispatch for Intra-Zonal Congestion Management.
- B 3.13**          **GOC<sub>jt</sub> - \$**  
The Trading Interval Grid Operations Charge by the ISO for Trading Interval<sub>t</sub> for Scheduling Coordinator<sub>j</sub> in the relevant Zone with Intra-Zonal Congestion.
- B 3.14**          **QCHARGE<sub>jt</sub> - MWh**  
The Trading Interval metered Demand within a Zone for Trading Interval<sub>t</sub> for Scheduling Coordinator<sub>j</sub> whose Grid Operations Charge is being calculated.



- D 3.2**            **GenDev<sub>bixt</sub> – MWh**  
The deviation between scheduled and actual Energy Generation for Generator i in Zone x during BEEP Interval b in Settlement Period t.
- D 3.3**            **LoadDev<sub>bixt</sub> – MWh**  
The deviation between scheduled and actual Load consumption for Load i in Zone x during BEEP Interval b in Settlement Period t.
- D 3.4**            **ImpDev<sub>bqxt</sub> – MWh**  
The deviation between forward scheduled and Real Time adjustments to Energy imports, as adjusted for losses, for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.
- D 3.5**            **ExpDev<sub>bqxt</sub> – MWh**  
The deviation between forward scheduled and Real Time adjustments to Energy exports for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.
- D 3.6**            **G<sub>s,ixt</sub> – MWh**  
The scheduled Generation of Generator i in Zone x in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.
- D 3.6.1**         **G<sub>s,ixt-1</sub> – MWh**  
The scheduled Generation of Generator i in Zone x in Settlement Period t-1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.
- D 3.6.2**         **G<sub>s,ixt+1</sub> – MWh**  
The scheduled Generation of Generator i in Settlement Period t+1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.
- D 3.6.3**         **G<sub>adj,bixt</sub> – MWh**  
The Deviation of Generator i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Sections 7.2.6.1 or 7.2.6.2, or for settlement according to Section 11.2.4.2.
- D 3.7**            **G<sub>a,bixt</sub> – MWh**  
The total actual metered Generation of Generator i in Zone x during BEEP Interval b in Settlement Period t.
- D 3.8**            **G<sub>oblig,ixt</sub> – MWh**  
The total Spinning, Non-Spinning, and Replacement Reserve committed capacity of Generator i in Zone x in Settlement Period t, as reflected in the final Ancillary Services Schedules.

- D 3.15.2**       **$L_{adj,bixt}$**
- The Deviation of Demand  $i$  in Zone  $x$  ordered by the ISO in BEEP Interval  $b$  in Settlement Period  $t$  according to Sections 7.2.6.1 or 7.2.6.2, or for settlement according to Section 11.2.4.2.
- D 3.16**       **$L_{oblig,ixt}$**
- The total Non-Spinning and Replacement Reserve committed capacity of Load  $i$  in Zone  $x$  in Settlement Period  $t$ , as reflected in the final Ancillary Services Schedules.
- D 3.17**       **$L_{a/s,bixt} - MWh$**
- The Energy reduction by curtailable Load  $i$  in Zone  $x$  due to ISO dispatch of Ancillary Services from such curtailable Load (i.e., Load bidding into the Ancillary Services markets). This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval  $b$  in Settlement Period  $t$  for which such Ancillary Services dispatch instruction(s) applies.
- D 3.17.1**       **$L_{s/e,bixt} - MWh$**
- The Energy reduction by curtailable Load  $i$  in Zone  $x$  due to ISO dispatch of Supplemental Energy from such curtailable Load. This value will be calculated based on the projected impact of the expected Instructed Imbalance Energy during BEEP Interval  $b$  in Settlement Period  $t$
- D 3.18**       **$L_{s,qxt} - MWh$**
- The total scheduled Energy import of Scheduling Coordinator  $j$  through Scheduling Point  $q$  in Settlement Period  $t$  as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.
- D 3.19**       **$L_{a,bqxt} - MWh$**
- The total actual Energy import of Scheduling Coordinator  $j$  through Scheduling Point  $q$  in BEEP Interval  $b$  during BEEP Interval  $b$  in Settlement Period  $t$ . This is deemed to be equal to the scheduled Energy over the same interval.
- D 3.20**       **$I_{adj,bqxt} - MWh$**
- The deviation in real time import of Scheduling Coordinator  $j$  through Scheduling Point  $q$  in BEEP Interval  $b$  during BEEP Interval  $b$  in Settlement Period  $t$  ordered by the ISO for congestion management, overgeneration, etc. or a result of an import curtailment. This value will be calculated based on the projected impact of the Dispatch instruction(s) (or curtailment event) between the close of the Hour-Ahead Market and the end of the BEEP Interval for which such Dispatch Instructions(s) (or curtailment event) applies.

**ATTACHMENT B**

**2.2.10.6 Ancillary Services.** Expected Ancillary Services requirement by reference to Zones for each of the reserve Ancillary Services, and

**2.2.10.7 ~~[Not Used] Advisory Intra-Zonal Congestion Scheduling Limits.~~** ~~To the Scheduling Coordinator for such affected Generating Units, the hourly maximum or minimum total allowable output for a Generating Unit or group of Generating Units constrained by the same Intra-Zonal interface that the ISO forecasts to be Congested due to de-rated transmission facilities, transmission outages, or other abnormal network configurations.~~

\* \* \*

**2.5.22.8 Intra-Zonal Congestion.** Except as provided in Section 5.2, in the event of Intra-Zonal Congestion in real time, the ISO shall adjust resources in accordance with Sections 7.2.6.1 and 7.2.6.2.

\* \* \*

**7.2.4.1.4** The ISO shall also use ~~the incremental Adjustment Bids from Generating Units and Adjustment Bids from other System Resources and Dispatchable Loads~~ in the ISO's real time system operation for Intra-Zonal Congestion Management and to decrement Generation in order to accommodate Overgeneration conditions, including Reliability Must-Run Generation which the ISO requests under Reliability Must-Run Contracts.

\* \* \*

## **7.2.6 Intra-Zonal Congestion Management.**

**7.2.6.1 ~~Intra-Zonal Congestion Management~~ Decremental Bids.** With regard to decremental bids, if Final Hour-Ahead Schedules cause Congestion on the Intra-Zonal interface, the ISO shall, after Dispatching available and effective Reliability Must-Run Units to manage the Congestion, create proxy Energy bids apply the decremental reference prices determined by the independent entity that determines the reference prices for the Automatic Mitigation Procedure (AMP) as described in Appendix A to the Market Monitoring and Information Protocol, and The ISO shall Dispatch Generating Units according to the decremental reference prices thus established, use bids based on the proxy Energy bid cost, the resource's effectiveness on the

Congestion, and other relevant factors such as Energy limitations, existing contractual restrictions, and Regulatory Must-Run or Regulatory Must-Take status, to alleviate the Congestion after Final Hour-Ahead Schedules are issued. Where the ISO must reduce a Generating Unit's output, ~~the ISO shall Dispatch Generating Units according to proxy Energy bids~~ the decremental reference prices and not according to Adjustment Bids or Supplemental Energy Bids to alleviate Intra-Zonal Congestion. No Generating Unit shall be Dispatched below its minimum operating level or above its maximum operating level. No Reliability Must-Run Unit shall be Dispatched below the operating level determined by the ISO as necessary to maintain reliability. If Congestion still exists after all Generating Units are Dispatched to their minimum operating levels, the ISO shall instruct Generating Units to shut off in merit order based on their ~~proxy Energy cost~~ decremental reference prices at minimum load, beginning with the most expensive unit.

~~The ISO shall create the proxy Energy bids 1) for~~ apply the decremental reference prices to thermal Generating Units, ~~using the unit's incremental heat rate curve, the proxy cost for natural gas posted on the ISO Home Page, and a \$6.00/MWh variable operations and maintenance adder, or 2) for~~ and to non-thermal Generating Units, ~~using the unit's reference price as determined in Appendix A to the Market Monitoring and Information Protocol.~~

If the ISO Dispatches System Resources or Dispatchable Loads to alleviate Intra-Zonal Congestion, the ISO shall Dispatch those resources in merit order according to the resource's Day-Ahead or Hour-Ahead Adjustment Bid or Imbalance Energy bid.

The ISO shall only redispatch Regulatory Must-Take or Regulatory Must-Run Generation, Intermittent Resources, or Qualifying Facilities to manage Intra-Zonal Congestion after redispatching all other available and effective generating resources, including Reliability Must-Run Units.

\* \* \*

**7.2.6.2 Intra-Zonal Congestion During Initial Period Incremental Bids.** With regard to incremental bids, ~~except as provided in Sections 5.2, 7.2.6.1, and 11.2.4.2,~~ the ISO will perform

Intra-Zonal Congestion Management in real time using available Adjustment Bids and Imbalance Energy bids, based on their effectiveness and in merit order, to minimize the cost of alleviating Congestion. In the event no Adjustment Bids or Imbalance Energy bids are available, the ISO will exercise its authority to direct the redispatch of resources as allowed under the Tariff, including Section 2.4.2 and 2.4.4, as provided in Section 7.2.6.

\* \* \*

#### **20.3.4 Disclosure**

Notwithstanding anything in this Section 20.3 to the contrary,

- (a) The ISO: (i) shall publish individual bids for Supplemental Energy, individual bids for Ancillary Services, and individual Adjustment Bids, provided that such data are published no sooner than six (6) months after the Trading Day with respect to which the bid or Adjustment Bid was submitted and in a manner that does not reveal the specific resource or the name of the Scheduling Coordinator submitting the bid or Adjustment Bid, but that allows the bidding behavior of individual, unidentified resources and Scheduling Coordinators to be tracked over time; and (ii) may publish data sets analyzed in any public report issued by the ISO or by the Market Surveillance Committee, provided that such data sets shall be published no sooner than six (6) months after the latest Trading Day to which data in the data set apply, and in a manner that does not reveal any specific resource or the name of any Scheduling Coordinator submitting bids or Adjustment Bids included in such data sets.
- (b) If the ISO is required by applicable laws or regulations, or in the course of administrative or judicial proceedings, to disclose information that is otherwise required to be maintained in confidence pursuant to this Section 20.3, the ISO may disclose such information; provided, however, that as soon as the ISO learns of the disclosure requirement and prior to making such disclosure, the ISO shall notify any affected Market Participant of the requirement and the terms thereof. The Market Participant may, at its sole discretion and own cost, direct any challenge to or defense against the disclosure requirement and the ISO shall cooperate with such affected Market Participant to the maximum extent

practicable to minimize the disclosure of the information consistent with applicable law. The ISO shall cooperate with the affected Market Participant to obtain proprietary or confidential treatment of confidential information by the person to whom such information is disclosed prior to any such disclosure.

- (c) In order to maintain reliable operation of the ISO Control Area, the ISO may share individual Generating Unit Outage information with the operations engineering and/or the outage coordination division(s) of other Control Area operators, Participating TOs, MSS Operators ~~or other entities~~ engaged in the operation and maintenance of the electric supply system whose system is significantly affected by the Generating Unit and who have executed the Western Electricity Coordinating Council Confidentiality Agreement for Electric System Data.

\* \* \*

## Appendix F, Schedule 2

### Grid Operations Charge for Intra-Zonal Congestion

Intra-Zonal Congestion during the initial period of operation will be managed in accordance with ISO Tariff Sections 7.2.6.12 and 7.2.6.23.

\* \* \*

## DISPATCH PROTOCOL (DP)

### DP 8.6.2 Utilization of the Merit Order Stack

The ISO will use the merit order stack as produced by BEEP, consisting of all the Supplemental Energy and Ancillary Services Energy bids as described in the SP to procure balancing Energy for:

- (a) satisfying needs for Imbalance Energy;
- (b) mitigating Inter-Zonal Congestion;
- (c) allowing resources providing Regulation service to return to the mid-point of their regulating ranges;
- (d) allowing recovery of Operating Reserves utilized in real time operations;
- (e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and
- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time.

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## SCHEDULES AND BIDS PROTOCOL (SBP)

### SBP 2.1.1 Generation Section of a Balanced Schedule and Adjustment Bid Data

The Generation section of a Balanced Schedule will include the following information for each Generating Unit:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) name of Generating Unit scheduled;
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) priority type, if applicable, to the Settlement Period (use OTHER if scheduling the use of Existing Contract rights or RLB\_MUST\_RUN) for Reliability Must-Run Generation;
- (f) contract reference number for Reliability Must-Run Generation;
- (g) ~~Inter-Zonal~~ Congestion Management flag – “Yes” indicates that any Adjustment Bid submitted under item (k) below should be used;
- (h) publish Adjustment Bid flag, which will not be functional on the ISO Operations Date. In the future, “Yes” will indicate that the SC wishes the ISO to publish its Adjustment Bids;
- (i) Generating Unit ramp rate in MW/minute;
- (j) hourly scheduled Generating Unit output in MWh (the ISO will multiply these values by the hourly Generation Meter Multipliers), including any zero values, for each Settlement Period of the Trading Day (in the case of a Day-Ahead Schedule) and for the relevant Settlement Period (in the case of an Hour-Ahead Schedule); and
- (k) the MW and \$/MWh values for each Generating Unit for which an Adjustment Bid is being submitted consistent with SBP 4.

\*\*\*

### SBP 4 ADJUSTMENT BIDS

Adjustment Bids will be used by the ISO for Inter-Zonal Congestion Management as described in the SP and are initially valid only for the markets into which they are bid, being the Day-Ahead Market or the Hour-Ahead Market. These Adjustment Bids will not be transformed into Supplemental Energy bids. However, these Adjustment Bids are treated as standing offers to the ISO and may be used by the ISO in the Real Time Market for the purpose of managing Intra-Zonal Congestion using System Resources, and Dispatchable Loads and increasing Generating Units' output and for managing Overgeneration conditions.

\*\*\*



## SCHEDULING PROTOCOL (SP)

### SP 10.1 Congestion Management Assumptions

The Inter-Zonal Congestion Management process is based upon the following assumptions:

- (a) Inter-Zonal Congestion Management will ignore Intra-Zonal Congestion. Intra-Zonal Congestion will be managed in accordance with Tariff Sections ~~2.2.10.7~~ and 7.2.6;
- (b) Inter-Zonal Congestion Management will use a DC optimal power flow (OPF) program that uses linear optimization techniques with active power (MW) controls only; and
- (c) transmission capacity reserved under Existing Contracts will not be subject to the ISO's Congestion Management procedures.

\* \* \*

### SP 11.3 Use of the Merit Order Stack

The merit order stack, as described in SP 11.2, can be used to supply Energy for:

- (a) satisfying needs for Imbalance Energy (differences between actual and scheduled Generation, Demand and external imports/exports) in real time;
- (b) managing Inter-Zonal Congestion in real time;
- (c) supplying Energy necessary to allow resources providing Regulation service to return to the base point of their regulating ranges in real time;
- (d) recovering Operating Reserves utilized in real time;
- (e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and
- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time.

\* \* \*

**SETTLEMENT AND BILLING PROTOCOL**

**APPENDIX B**

**GRID OPERATIONS CHARGE COMPUTATION**

**B 1 Purpose of charge**

The Grid Operations Charge is a charge which recovers redispatch costs incurred due to Intra-Zonal Congestion pursuant to Section 7.3.2 of the ISO Tariff. The Grid Operations Charge is paid by or charged to Scheduling Coordinators in order for the ISO to recover and properly redistribute the costs of adjusting the Balanced Schedules submitted by Scheduling Coordinators.

**B 2 Fundamental formulae**

**B 2.1 Payments to SCs with incremented schedules**

When it becomes necessary for the ISO to increase the output of a Scheduling Coordinator's Generating Unit; or System Resource; or reduce a Curtailable Demand; in order to relieve Congestion within a Zone, the ISO will pay the Scheduling Coordinator. The amount that ISO pays the Scheduling Coordinator; ~~for increasing the output of Generating Unit; is the greater of (1) 1.1 times the price specified in the Scheduling Coordinator's proxy energy Day-Ahead or Hour-Ahead Adjustment Bid as determined in accordance with Section 7.2.6.1 or (2) the relevant BEEP Interval Ex Post Price multiplied by the quantity of Energy Dispatched.~~ ~~(or Imbalance Energy bid as appropriate) for the Generating Unit; or~~ ~~The amount that ISO pays the Scheduling Coordinator; for increasing the output of a System Resource; or Curtailable Demand; is the price specified in the Scheduling Coordinator's Day-Ahead or Hour-Ahead Adjustment Bid (or Imbalance Energy bid as appropriate) multiplied by the quantity of Energy Dispatched.~~ The formula for calculating the payment to Scheduling Coordinator; for each block<sub>b</sub> of Energy of its Adjustment Bid curve in Trading Interval<sub>t</sub> is:

$$INC_{bijt} = adjinc_{bijt} * \Delta inc_{bijt}$$

**B 2.1.1 Total Payment for Trading Interval**

The formula for calculating payment to Scheduling Coordinator; whose Generating Unit; or System Resource; has been increased or Curtailable Demand; reduced for all the relevant blocks<sub>b</sub> of Energy in the applicable ~~proxy energy bid curve,~~ Adjustment Bid curve; (or Imbalance Energy bid) of that Generating Unit or System Resource or Curtailable Demand in the same Trading Interval<sub>t</sub> is:

$$PayTI_{ijt} = \sum_b INC_{bijt}$$

**B 2.2 Charges to Scheduling Coordinators with decremented schedules**

When it becomes necessary for the ISO to decrease the output of a Scheduling Coordinator's Generating Unit; or System Resource; in order to relieve Congestion within a Zone, the ISO will make a charge to the

Scheduling Coordinator. The amount that the ISO will charge Scheduling Coordinator<sub>j</sub> for decreasing the output of Generating Unit<sub>i</sub> is the lesser of (1) 0.9 times the decremental reference price specified in for the Scheduling Coordinator's proxy energy bid as determined in accordance with Section 7.2.6.1 or (2) the relevant BEEP Interval Ex Post Price multiplied by the quantity of Energy Dispatched. The amount that the ISO will charge Scheduling Coordinator<sub>j</sub> for decreasing the output of a System Resource<sub>i</sub> is the price specified in the Scheduling Coordinator's Day-Ahead or Hour-Ahead Adjustment Bid (or Imbalance Energy Bid as appropriate) for System Resource<sub>i</sub>, multiplied by the quantity of Energy Dispatched. The formula for calculating the charge to Scheduling Coordinator<sub>j</sub> for each block<sub>b</sub> of Energy in its decremental reference price, applicable proxy energy bid curve, Adjustment Bid curve, or Imbalance Energy bid in Trading Interval<sub>t</sub> is:

$$DEC_{bijt} = adjdec_{bijt} * \Delta dec_{bijt}$$

**B 2.2.1 Total Charge for Trading Interval**

The formula for calculating the charge to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> has been decreased for all the relevant blocks<sub>b</sub> of Energy at in the applicable decremental reference price for Generating Unit<sub>i</sub>, proxy energy bid curve, Adjustment Bid curve, or Imbalance Energy bid for System Resource<sub>i</sub> of that Generating Unit or System Resource in the same Trading Interval<sub>t</sub> is:

$$ChargeTI_{ijt} = \sum_b DEC_{bijt}$$

\*\*\*

**B 3 Meaning of terms of formulae**

**B 3.1 INC<sub>bijt</sub> - \$**

The payment from the ISO due to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> is increased or Curtailable Load<sub>j</sub> is reduced within a block<sub>b</sub> of Energy in the applicable proxy energy bid curve, its Adjustment Bid curve, (or Imbalance Energy bid) in Trading Interval<sub>t</sub> in order to relieve Intra-Zonal Congestion.

**B 3.2 adjinc<sub>bijt</sub> - \$/MWh**

The incremental cost for the rescheduled Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> taken from the relevant block<sub>b</sub> of Energy in the applicable proxy energy bid curve, Day-Ahead or Hour-Ahead Adjustment Bid curve, (or Imbalance Energy bid) submitted by the Scheduling Coordinator<sub>j</sub> or generated by the ISO for the Trading Interval<sub>t</sub>.

**B 3.3 Δinc<sub>bijt</sub> - MW**

The amount by which the Generating Unit<sub>i</sub> or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> of Scheduling Coordinator<sub>j</sub> for Trading Interval<sub>t</sub> is increased by the ISO within the relevant block<sub>b</sub> of Energy in its applicable proxy energy bid curve, Adjustment Bid curve, (or Imbalance Energy bid).

**B 3.4**            **PayT<sub>ij</sub>t - \$**

The Trading Interval payment to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> has been increased or System Resource<sub>i</sub> or Curtailable Load<sub>j</sub> reduced in Trading Interval<sub>t</sub> of the Trading Day.

**B 3.5**            **DEC<sub>bijt</sub> - \$**

The charge to Scheduling Coordinator<sub>j</sub> whose Generating Unit<sub>i</sub> or System Resource<sub>i</sub> is decreased for Trading Interval<sub>t</sub> within a block<sub>b</sub> of Energy in its ~~at the decremental reference price for Generating Unit<sub>i</sub>; applicable proxy energy bid curve, or in the Adjustment Bid curve, (or Imbalance Energy bid) for System Resource<sub>i</sub>.~~

**B 3.6**            **adjdec<sub>bijt</sub> - \$/MWh**

The decremental cost for the rescheduled Generating Unit<sub>i</sub> or System Resource<sub>i</sub> taken from the relevant block<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub>; or of the applicable proxy energy bid curve, Day-Ahead or Hour-Ahead Adjustment Bid curve, (or Imbalance Energy bid) for System Resource<sub>i</sub>, submitted by Scheduling Coordinator<sub>j</sub> or generated by the ISO for the Trading Interval<sub>t</sub>.

**B 3.7**            **Δdec<sub>bijt</sub> - MW**

The amount by which the Generating Unit<sub>i</sub> or System Resource<sub>i</sub> of Scheduling Coordinator<sub>j</sub> for Trading Interval<sub>t</sub> is decreased by ISO within the relevant block<sub>b</sub> of Energy at the decremental reference price for Generating Unit<sub>i</sub>; or of its applicable proxy energy bid curve, Adjustment Bid curve, (or Imbalance Energy bid) for System Resource<sub>i</sub>.

\*\*\*

**APPENDIX D**

**IMBALANCE ENERGY CHARGE COMPUTATION**

**D 3.6.3**            **G<sub>adj,bixt</sub> – MWh**


The Deviation of Generator i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Sections 7.2.6.1~~2~~ or 7.2.6.2, or for settlement according to Section 11.2.4.2.

\*\*\*

**D 3.15.2**            **L<sub>adj,bixt</sub>**


The Deviation of Demand i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Sections 7.2.6.1 or 7.2.6.2, or for settlement according to Section 11.2.4.2.

**ATTACHMENT C**

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## PURPOSE

Sets forth the actions to be undertaken by CAISO to mitigate Intra-Zonal congestion.

## PROCEDURE

Following is a list of instructions for the mitigation of real-time (RT) Intra-Zonal Congestion. When Intra-Zonal Congestion occurs, the RT Generation Dispatchers and Grid Resource Coordinators (GRCs) shall take the following steps to mitigate the Intra-Zonal Congestion. The CAISO approach to mitigate Intra-Zonal Congestion in RT in non-emergency conditions is, in sequence, to:

1. Dispatch in-sequence market bids (incremental or decremental, as required), from any resource, to resolve the Intra-Zonal Congestion.
2. If RMR units can be used to mitigate the Intra-Zonal Congestion, increment RMR units under their RMR contracts or reduce their RMR schedules (not RMR unit market schedules) as needed.
3. Dispatch incremental out-of sequence market bids for intra-zonal congestion that primarily requires incremental energy to alleviate the congestion
4. Dispatch Incremental Adjustment bids
5. Dispatch decremental reference bids based on reference level curves for intra-zonal congestion that primarily requires decremental energy to alleviate congestion.

In those instances of insufficient bids, RT mitigation measures may include other steps as outlined in this Operating Procedure.


### 1. EMERGENCY OPERATIONS

The Shift Manager determines if an emergency exists and controls the situation appropriately. If a transmission congestion emergency exists, it may be necessary to skip steps outlined in this procedure to control the situation. If a transmission congestion emergency arises that jeopardizes the reliable operation of the CAISO Control Area, the CAISO shall immediately take whatever actions are necessary to maintain reliability of the CAISO Control Area. This emergency action includes, if required, direct contact with generating facilities. After the transmission emergency in the congested area has been addressed, the CAISO replaces the emergency actions previously taken with the appropriate steps outlined in this procedure.

#### 1.1. Issue a Dispatch Instruction

A dispatch instruction is issued to Market Participants to perform as required based on Market Participant Responsibilities, and to comply with Dispatch Instructions (DP 9.2.1) and Response Required by Generators to CAISO Dispatch Instructions (DP 9.4.1).

- 1.1.1. A dispatch instruction can be issued during a non-emergency event to maintain reliable operation of the CAISO Control Area.

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1.1.2. Dispatch instructions are issued by one of the following methods:

- A. To the generating resource determined to be the most effective in order to immediately alleviate the transmission congestion emergency.
- B. Pro rata (based on the unit's allocated maximum capacity) to all of the units in the congested area, where the allocated maximum capacity is equal to the total transmission capacity multiplied by the ratio of the unit's maximum generation capacity to the total maximum generation capacity in the congested area. For example:

Transmission capacity available = 100 MW

Total maximum generation in congested area = 500 MW

100 MW Unit's Share =  $100 \text{ MW} * (100 \text{ MW}/500 \text{ MW}) = 20 \text{ MW}$

If this unit is operating below the 20 MW allocation, the unit is not curtailed in RT. However, if the unit were above 20 MW, the unit would be curtailed back to 20 MW.



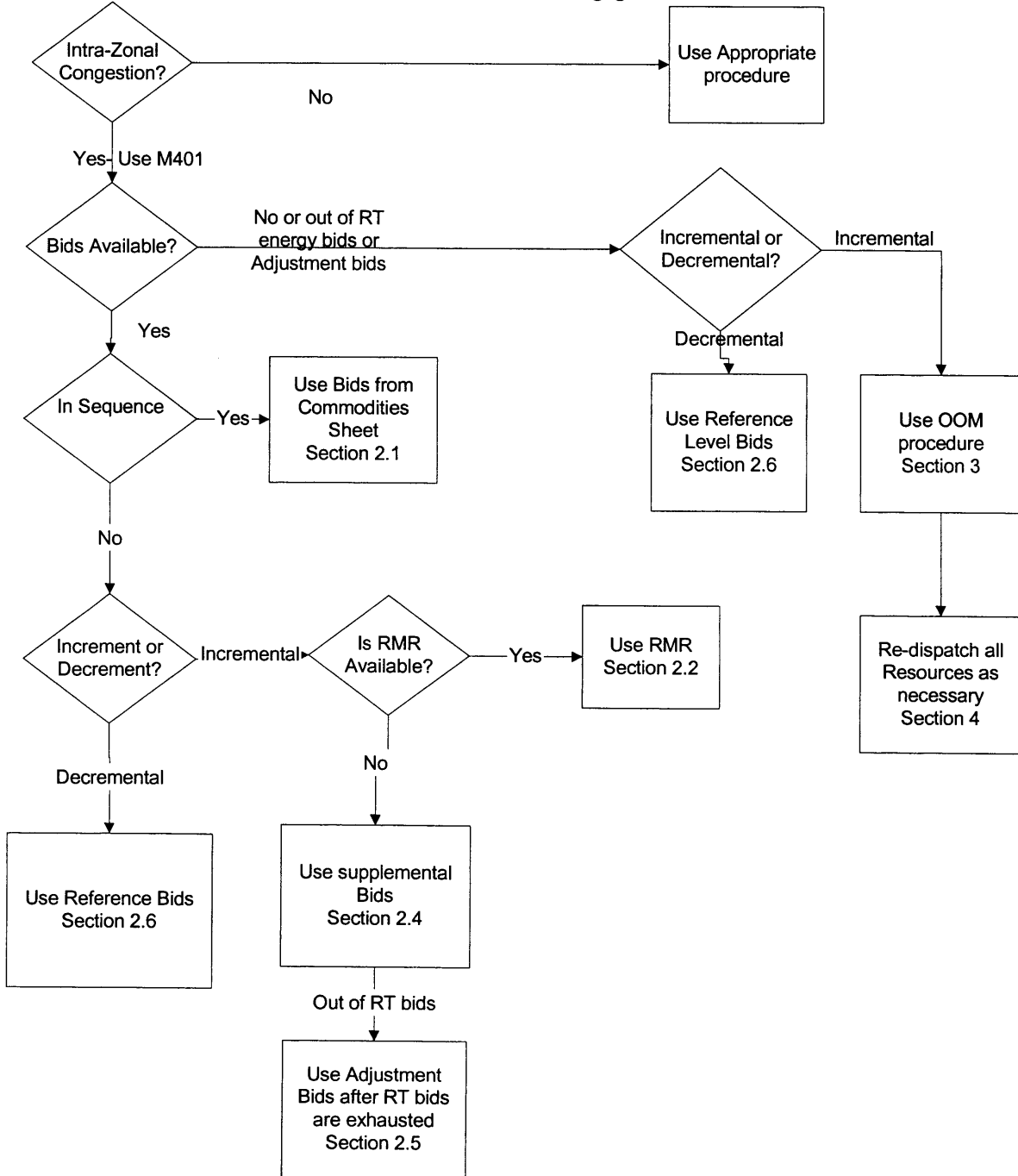



**Real-time Intra-Zonal Congestion Management**

**Distribution Restriction:  
None**

**2. NORMAL OPERATIONS**

The normal sequence for dispatching generation to mitigate Intra-Zonal Congestion shall occur by the use of the following guidelines:



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## 2.1. Dispatch Imbalance Energy Bids – In Sequence

2.1.1. Incremental and decremental RT Imbalance Energy Bids are used in merit order (in sequence via ADS) to increment and decrement the resource(s) required for mitigation of Intra-Zonal Congestion if the following conditions are met:

- The unit satisfies the criteria for mitigating the Intra-Zonal Congestion.
- The unit is the next bid available in sequence in BEEP.

2.1.2. Incremental and decremental bids are chosen so they do not worsen Intra-Zonal Congestion or create Inter-Zonal Congestion.

2.1.3. Energy bids are exercised in pairs whenever possible (i.e., if bids are available). If a decremental bid is used then an equivalent incremental bid should also be used.

2.1.4. If two or more generating units bid the same bid price, the Generation Dispatcher issues the instruction based on the effectiveness of the unit. Effectiveness factors for normal system conditions are provided by CAISO Operations Engineering personnel. These effectiveness factors are located in the transmission procedures for the specific local reliability area. Otherwise, for specific clearances, the effectiveness factors may be located in the SLIC outage card. The unit with the greatest effectiveness is dispatched first. If two or more units have the same effectiveness factors, then the dispatch instruction is divided pro-rata based on the unit's maximum capacity.


*Note: Step 2.1 is implemented until such time that all available Imbalance Energy bids, in-sequence, from local area resources are exhausted.*

## 2.2. Dispatch Reliability Must Run (RMR) Resources

RMR resources are utilized as applicable to maintain the reliability in locally constrained areas (as defined in Attachment A) as per the RMR agreement for that resource. When utilizing RMR resources, the most effective unit should be utilized. However, total annual run-time limitations for selected RMR units (e.g., combustion turbines) should be taken into consideration. Refer to the applicable local area transmission procedure for further direction and possible limitations on specific units.

### 2.2.1. Incrementing RMR Units

The CAISO shall use the RMR Unit's incremental market bid if that bid is the next bid in sequence. If the incremental market bid is not the next bid in sequence or if the CAISO cannot use this bid without decrementing another supplier, the CAISO dispatches the RMR unit as needed under that unit's RMR Contract. Attachment A, Reliability

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Must-Run Solutions, lists the local reliability areas and the transmission facilities that are defined to have RMR solutions.

### 2.2.2. Decrementing RMR Units

The CAISO may reduce an RMR unit's **RMR schedule** as needed to solve intra-zonal congestion. The CAISO cannot decrement an RMR unit's market schedule under the RMR Contract to manage intra-zonal congestion. The RMR Contract allows the CAISO only to decrement an RMR unit's market schedule to provide Ancillary Services, including voltage support.

The CAISO must use reference decremental bids from the RMR units if available (Refer to Section 2.6).


### 2.3. Use of Effectiveness Factors

**2.3.1. Incremental Dispatch.** For incremental bids, effectiveness factors will be utilized in conjunction with the merit order real time energy bids. The operator will divide the unit's bid price by the effectiveness factor to determine an effective price. The unit will be dispatched in merit order of all units available to alleviate the congestion, based on the effective prices. The purpose will be to minimize the incremental cost to mitigate for Intra-Zonal Congestion.

**For example:** Assume unit A with a price of \$50 and an effectiveness of 0.5, and unit B with a price of \$40 and an effectiveness of 0.25. A's price-effective value is \$100/MW, while B's is \$160/MW. If incremental dispatch is required, the ISO should dispatch A first, then B.

**2.3.2. Decremental Dispatch.** For decremental bids, effectiveness factors will be used to determine the required mitigation. The purpose will be to minimize the total MW movement to mitigate for Intra-Zonal Congestion. If more than one unit has the same effectiveness factor, the highest price reference bid will be utilized. If price and effectiveness factors are the same, the units will be decremented pro rata.

Effectiveness factors for normal system conditions are provided by CAISO Operations Engineering personnel. These effectiveness factors are located in the transmission procedures for the specific local reliability area. Otherwise, for specific clearances, the effectiveness factors may be located in the SLIC outage card.

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## 2.4. Dispatch Imbalance Energy Bids – Out-of-Sequence (OOS) – Incremental Solution

2.4.1. Incremental RT Imbalance Energy Bids may be dispatched Out-of-Sequence, in merit order, based on effective price, via ADS, to increment the resource(s) required for mitigation of Intra-Zonal Congestion if the following conditions are met:

- The unit satisfies the criteria for mitigating the Intra-Zonal Congestion.
- All in-sequence bids that would mitigate the congestion have been exhausted.
- No RMR unit is available for an additional energy dispatch that would mitigate the congestion.

2.4.2. Incremental bids are chosen so they do not exacerbate Intra-Zonal Congestion or create Inter-Zonal Congestion.

2.4.3. Energy bids are exercised in pairs whenever possible (i.e., if bids are available). If an incremental bid is used then an equivalent decremental market bid should also be used to balance the system.

*Note: Step 2.4 is implemented until such time that all available OOS Imbalance Energy bids from local area resources are exhausted.*

2.4.4. Refer to Operating Procedure M-425 for instruction on Out-of-Sequence (OOS) Dispatch logging procedures for Generation Dispatchers and GRCs.

2.4.5. If a resource is energy-limited or has emissions or other environmental constraints it may be skipped at the discretion of the Generation dispatcher.


## 2.5. Dispatch Incremental Adjustment Bids

When all incremental bids from the Real Time market are exhausted, Adjustment Bids remaining from the DA and HA markets will be utilized, in Merit order, based on effective price.

## 2.6. Dispatch Decremental Energy Bids – Reference Bids based on Reference Level Curves – Decremental Solution

2.6.1. Potomac Economics will provide decremental reference energy curves for all units within the control area. CAISO will produce a merit order list of decremental reference bids from these curves to be utilized for Intra-zonal congestion.

2.6.2. Decrement energy reference bids to decrement the resource(s) required for mitigation of Intra-Zonal Congestion if the following conditions are met:

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- The unit satisfies the criteria for mitigating the Intra-Zonal Congestion.
- All in-sequence bids that would mitigate the congestion have been exhausted

**2.6.3.** Dispatches to alleviate Intra-zonal congestion will be pre-dispatched after the HA market closes but as much before the operating hour as possible utilizing the decremental reference bids

**2.6.4.** If additional relief is required in Real Time, the operator will utilize the Real Time Reference Level bid stack. System Resources may be available after the close of the Real Time Market and can be taken OOS, in merit order with the reference level bids.

**2.6.5.** Decremental reference bids are chosen so they do not exacerbate Intra-Zonal Congestion or create Inter-Zonal Congestion.

**2.6.6.** Energy bids are exercised in pairs whenever possible (i.e. if bids are available). If a decremental reference bid is used, then an equivalent incremental Market bid should also be used to balance the system.


**NOTE:** Step 2.6 is implemented until such time that all available OOS Reference Energy bids from local area resources are exhausted.

## **2.7. Market Notification**

**2.7.1.** In the event that all of the market bids are exhausted, or it is anticipated that additional bids will be required for the Intra-Zonal Congestion the RT GRC sends out a Market Notice to all Scheduling Coordinators. The Market Notice states that Intra-Zonal Congestion is occurring and that the CAISO is seeking additional Imbalance Energy bids to mitigate the Congestion. The message includes the Intra-Zonal path and gives an indication where the incremental bids and decremental bids from System Resources are required. Specific messages may be available in applicable transmission procedures or the following is an example of this market notice:

*“Load is increasing on (list path or equipment), in the (list appropriate zone), and requires incremental Energy bids south of the path (or in the zonal location) and decremental System Resource Energy bids for resources north of the path (or in the zonal location). To the extent that Scheduling Coordinators do not respond with sufficient decremental System Resources and incremental Energy bids to mitigate the anticipated Congestion, the CAISO may invoke the other steps in the Intra-Zonal Congestion Management Procedure including making out-of-market requests.”*

If Out-of-Market resources are utilized, at the end of each hour, a follow-up Market Notice is sent out by the RT GRC to the SCs. The

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purpose of this message is to notify the SCs the range in bid cost required to control Intra-Zonal Congestion over the course of the last hour. The following is an example of this type of market notice:

*“For HE\_\_ the CAISO utilized Energy Adjustment Bids, Imbalance Energy Bids, [and resources called out-of-market] in the range of \$\_\_ to \$\_\_ to control Intra-Zonal Congestion across Path (or in Zonal location)\_\_\_\_\_.”*

### 2.7.2. Additional Logging

After sending the Market Notice, the RT GRC creates an appropriate log entry in SLIC. The title of the SLIC log entry shall be “Intra-Zonal Congestion Bid Request” for the request for additional bids and “Market Message – Other” for the pricing notification. The SLIC log entry includes the text message that was sent to the SCs (cut and paste) and the time and date when the Market Notice was sent. It should also include the specific area and the name of the Transmission Owner in which the Intra-Zonal Congestion is located.

## 3. OOM AND RMT AS NECESSARY

This step may include Dispatch of Out-of-Market (OOM), Regulatory Must Take (RMT), and QF resources. All resources are dispatched in this step through “Out-of-Market dispatch instructions” (via ADS). All market-provided resources and RMR resources should be exhausted prior to this step. RMT resources are dispatched prior to other OOM resources.

### 3.1. OOM Dispatch for Intra-Zonal Congestion


3.1.1. If RMT resources are exhausted and the congestion remains, issue OOM dispatch instructions.

The Generation Dispatcher issues the instruction based on the effectiveness of the unit. Effectiveness factors are provided by CAISO Operations Engineering personnel for normal system conditions. The unit with the greatest effectiveness is dispatched first. If two or more units have the same effectiveness factors, then the dispatch instruction is divided pro-rata based on the unit’s maximum capacity.

3.1.2. If no effectiveness factors are available, the Generation Dispatcher issues OOM dispatch instructions to the units most logically effective for the individual situation.

### 3.2. OOM Logging for Intra-Zonal Congestion

Refer to Operating Procedure M-425 for instruction on OOM Dispatch logging procedures for Generation Dispatchers and GRCs.

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#### 4. RE-DISPATCH ALL RESOURCES AS NECESSARY

If after all available incremental and decremental energy bids are exercised, and RMR options are exhausted, in addition to the other steps in this procedure to mitigate the Intra-Zonal Congestion, and Intra-zonal Congestion is not sufficiently mitigated, the Shift Manager or their designee, directs the re-dispatch of any available resource throughout the system (including requesting help from external Control Areas) as necessary to mitigate the congestion. This may include exporting at one boundary and/or importing at another boundary.


## SUPPORTING INFORMATION

### Affected Parties

- California ISO
- Market Participants

### Responsibilities

Party	Responsibility
<b>CAISO Generation Dispatchers</b>	<ul style="list-style-type: none"> <li>• Effectively communicate resource adjustment details with GRCs</li> <li>• Call for RMR resources as necessary</li> <li>• Identify resources to dispatch</li> <li>• Log detailed information in SLIC for settlement purposes.</li> </ul>
<b>CAISO Grid Resource Coordinators</b>	<ul style="list-style-type: none"> <li>• Analyze Day Ahead (DA) and Hour Ahead (HA) resource Generator Schedules, Energy Adjustment Bids, Imbalance Energy Bids, and Reference Level bids.</li> <li>• Notify the Manager of Markets as applicable in this procedure</li> <li>• Prioritize Generation Dispatcher submitted resource lists to utilize lowest cost/most effective resources available.</li> <li>• Log Adjustment Bids and Imbalance Bids not dispatched through ADS in OSMOSIS for settlement purposes.</li> </ul>
<b>CAISO Transmission Dispatchers</b>	<ul style="list-style-type: none"> <li>• Notify Market Participants of Congestion and Request Bid</li> <li>• Provide timely, detailed, communication of Intra-Zonal Congestion to Generation Dispatcher, GRC, and Shift Manager as needed.</li> <li>• Assess the severity of the Intra-Zonal Congestion and determine if there is adequate time for the GRC to follow through the optimized low-cost resource adjustment analysis.</li> <li>• Communicate nature and location of constraint, and list resources to utilize and solve the constraint to the GRCs</li> </ul>
<b>Manager of Markets</b>	<ul style="list-style-type: none"> <li>• Coordinate Market Participants activities</li> </ul>


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- |                               |  |
|-------------------------------|--|
| <b>Operations Engineering</b> | <ul style="list-style-type: none"> <li>• Provide Unit Effectiveness factors for congested areas for normal system conditions</li> <li>• Provide Outage coordination with acceptable area generation output levels for scheduled outages</li> </ul> |
| <b>Outage Coordination</b>    | <ul style="list-style-type: none"> <li>• Request review by Operation Engineering as needed to determine area limitations</li> <li>•</li> </ul>   |
| <b>Shift Manager</b>          | <ul style="list-style-type: none"> <li>• Determine Emergency Status of Congested Areas</li> </ul>  |

## Policy

CAISO will attempt to minimize Intra-Zonal Congestion prior to RT by invoking existing Interconnection Agreements where applicable, and by requesting the cooperation of Market Participants where no such agreements apply. Where appropriate, and where no RMR units can be used, or where RMR units have submitted bids that are the next bid in merit order, CAISO employs a “market first” policy for RT management of Intra-Zonal Congestion. Intra-zonal Congestion is managed in RT by utilizing Incremental Imbalance Energy bids and Decremental Reference level bids in merit order and based on their effectiveness. Where RMR units are available to increment to mitigate the Intra-Zonal Congestion, and where those RMR units’ incremental bids are not the next bids in merit order or where taking an RMR unit’s incremental market bid requires that another resource be decremented, the CAISO shall dispatch RMR units under the terms of their RMR Contracts to mitigate RMR Intra-Zonal Congestion. Resources are to be incremented and decremented on either side of the Intra-Zonal Interface to relieve Congestion. Intra-Zonal Congestion management is performed so as not to create Inter-Zonal Congestion. The difference in incremental bid(s) and decremental bid(s) is the Grid Operations Charge associated with the Congestion. In the event there are inadequate bids to resolve the RT Congestion, Reliability Must-Run resources may be utilized under their RMR contracts for incremental re-dispatch. Out-of-market calls are made as a final means of RT mitigation if there is a deficiency in market bids or RMR units. *At no time shall BEEP be split for Intra-zonal Congestion management since it has an adverse impact on prices and does not solve the problem.*



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		<b>Effective Date</b>	07/01/03
<b>Real-time Intra-Zonal Congestion Management</b>		<b>Distribution Restriction: None</b>	

## References

Resources studied in the development of this procedure and that may have an effect upon some steps taken herein include but are not limited to:


- CAISO Tariff 7.2, 7.3, and Dispatch Protocol 9.2.1 and 9.4.1
- CAISO Operating Procedure S-315 Emergency Overload Mitigation
- CAISO Operating Procedure M-425 OOM and OOS Dispatch
- CAISO Operating Procedure T-113 Scheduled and Forced Outages

## Definitions

Unless the context otherwise indicates, any word or expression defined in the Master Definitions Supplement to the CAISO Tariff shall have that meaning when capitalized in this Operating Procedure.

## Version History

Version	Change	By	Date
1.0	Drafted	Ty Larson	3/31/98
2.0	Revised	Ty Larson	2/8/99
3.1	Updated	Trent Carlson	6/18/99
3.2	Updated	Mike Jackson	7/12/00
4.0	Major revisions to RT, emergency and pre-scheduled outage sections.	Christine Henry	10/13/01
5.0	Various	Christine Henry	12/12/01
5.1	Removed references to the requirement that bids must be competitive, and made other minor changes.	Christine Henry, Mark Willis, Deane Lyon	1/11/02
5.2	ADS II references added	J. Bellnap	8/6/02
5.3	Modification to 5.4., (1).	J. Bellnap	4/14/03
6.0	Removed section 5 for compliance with Amendment 50	J. Bellnap	6/19/03
7.0	Revised procedure to reflect the dispatch of decremental reference bids, and other minor changes for compliance w/Amendment 50	J. Bellnap	7/1/03


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## TECHNICAL REVIEW

Reviewed By Content Expert	Signature	Date
OSAT		
OE&M		
Grid Ops		
Market Ops		
Scheduling		

## APPROVAL

Approved By	Signature	Date
Director of Grid Operations		
Director of Market Operations		

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## APPENDIX

Attachment A: Reliability Must-Run Solutions

**ATTACHMENT D**

