

Standards for Imports of Regulation

Standards Applicable to SCs, Host Control Areas and the ISO

This standard has been developed to implement the California Independent System Operator's ("ISO") Tariff provisions relating to imports of regulation, either bid or self-provided, by Scheduling Coordinators ("SC") with System Resources (i.e., resources located outside the ISO Control Area). Consistent with the provisions of Amendment No. 25 to the ISO Tariff (as effective March 27, 2000), SCs may bid or self-provide external imports of Regulation from System Resources located outside the ISO Control Area (i.e., located in another Control Area jurisdiction), where technically feasible and consistent with all applicable WECC and NERC requirements; provided that the operator of such Control Area (referred to herein as the "Host Control Area") has entered into an applicable agreement and provided that such SC and Host Control Area operator have been certified by the ISO as to their ability to dynamically adjust interchange schedules based on control signals issued by the ISO Energy Management System ("EMS") anytime during a Settlement Period (i.e., relevant operating hour) at the sole discretion of the ISO. Such certification will include a demonstration of the parties' ability to support the dynamic interchange of Regulation service based on ISO EMS control signals received by the Host Control Area EMS via dedicated communications links in accordance with this and other relevant ISO standards and procedures posted on the ISO Home Page.

System Resource is defined in the ISO Tariff and, in the context of this standard, may include a single resource or generating plant, or a portion thereof, located within the Host Control Area, or an allocated portion of the Host Control Area's EMS/Automatic Generation Control which is directly responsive to the Host Control Area EMS/AGC, or other resources available to the Host Control Area.

This standard shall be interpreted in the context of the ISO Tariff and the applicable agreements. This standard is not intended to alter or change the meaning of any material provision thereof. Unless the context otherwise indicates, any word or expression defined in the Appendix A, Master Definitions Supplement to the ISO Tariff and capitalized herein shall have the same meaning where used in this standard.

1.0 Contractual Relationships

1.1 A Host Control Area is the Control Area where the System Resource that is bidding or self-providing Regulation resides. The Host Control Area may, or may not, be directly interconnected with the ISO Control Area.

1.2 If the Host Control Area is directly interconnected with the ISO Control Area, such Host Control Area must have executed the Interconnected

Control Area Operating Agreement (ICAOA) with the ISO, with accompanying service schedule for supporting Regulation imports, in order for System Resources in its Control Area to be certified as eligible to bid or self-provide Regulation imports to the ISO Control Area.

- 1.3 If the Host Control Area is not directly interconnected with the ISO Control Area, such Host Control Area must have executed a Control Area Operating Agreement (CAOA) with the ISO, with accompanying service schedule supporting Regulation imports, in order for System Resources in its Control Area to be certified as eligible to bid or self-provide Regulation imports to the ISO Control Area.
- 1.4 The SC for the System Resource must have the necessary operational and contractual arrangements in place with the Host Control Area. Such arrangements must include the Host Control Area operator's ability to receive telemetry from the System Resource and to send control signals to the System Resource. Proof of such arrangements must be provided to the ISO.
- 1.5 The SC and Host Control Area operator must jointly request the certification of a System Resource to provide Regulation for the ISO Control Area and cooperate in the testing of such System Resource (see certification form attached to this standard).
- 1.6 Only ISO tested and certified System Resources will be allowed to bid and/or self-provide Regulation service into the ISO Control Area.

2.0 Certification, Testing, and Performance Monitoring

- 2.1 See "Scheduling Coordinator & Host Control Area Operator Request for Certification of External Imports of Regulation " form attached to this standard.
- 2.2 Regulation imports will be tested, for certification, in accordance with the relevant sections of the ISO's Operating Procedure G-213. All requests for certification of Regulation imports will be reviewed and approved by the ISO 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 Regulation import limits in addition to those outlined below in Section 4.0. Therefore, interested parties are advised and encouraged to contact the ISO before they begin the process of the necessary systems design, preparation, and implementation for import of Regulation to the ISO Control Area.
- 2.3 The ISO will measure the performance of accepted Regulation service against (1) the awarded range of Regulation capacity (in the applicable direction(s) for upward Regulation and downward

Regulation); (2) the certified limits; and (3) the bid ramp rate, which shall be validated by the ISO against the certified ramp rate.

- 2.4 The SC for the System Resource and the Host Control Area must notify the ISO should any changes, modifications, or upgrades affecting control and/or performance of the System Resource be made. Upon such notification the ISO, at its discretion, may require that the System Resource and Host Control Area be re-certified to import Regulation into the ISO Control Area.

3.0 Communications

- 3.1 Dedicated dual redundant digital communications links between the ISO's EMS and the Host Control Area EMS are required.
- 3.2 The dedicated dual redundant circuits will be T1-class, or equivalent, and diversely routed between the Host Control Area EMS and the ISO Control Area EMS on separate physical paths and devices, utilizing the inter-control center communications protocol ("ICCP") or other agreed-upon protocol.

4.0 Limits

- 4.1 The ISO reserves the right to establish limits applicable to the amount of Regulation service imported into the ISO Control Area. Such limits may be established based on any one, or a combination, of the following considerations: a percentage of total ISO Control Area Regulation requirements; a percentage at a particular Scheduling Point or a branch group; a percentage of total Regulation requirements in a specific Congestion Zone; 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.
- 4.2 The ISO will give Market Participants at least seven days advance notice of any changes to the established limits of Regulation imports (e.g., via notices to the "Market Participants" e-mail distribution list and/or posting on the ISO Home Page). Notwithstanding this intention, the ISO may change such limits on a shorter notice should unexpected changes in system conditions warrant such decision to maintain System Reliability. In this instance, the ISO will notify the Market Participants as soon as practical.
- 4.3 Notwithstanding potential Regulation import limits described in Section 4.1, the following rules shall apply:
 - 4.3.1 Regulation, just as other imported Ancillary Services, can only be imported on transmission capacity that remains after

Congestion Management of Energy schedules in each forward market (i.e., Day-Ahead Regulation can be imported on branch groups that are not congested in the Day-Ahead, and Hour-Ahead Regulation can be imported on branch groups that are not congested in the Hour-Ahead. New Hour-Ahead Energy does not have priority over Day-Ahead Regulation bids that have been accepted.).

- 4.3.2 Regulation service cannot be imported on the direct current ("DC") interties (e.g., Regulation service cannot be scheduled at the Nevada-Oregon Border ("NOB") on the Pacific DC Intertie ("PDCI")).

5.0 Scheduling

- 5.1 The ISO will assign a unique identification to the System Resource to be certified and scheduled by the SC and Host Control Area operator.
 - 5.1.1 The ISO and each SC will agree to uniquely identify dynamic Schedules associated with the System Resource (i.e., by stating the SC name, name of the Scheduling Point, and assigning unique Schedule identification).
 - 5.1.2 For purposes of bidding and scheduling, the SC will attribute: (1) Regulation to the System Resource ID (i.e., a unique identification of the SC and System Resource) and (2) Energy to dynamic Schedules at the particular Scheduling Point.
- 5.2 All imports of Regulation capacity must be self-provided or bid in either the Day-Ahead or Hour-Ahead Market.
- 5.3 Each import of Regulation capacity must be flagged as either self-provided or bid in each applicable hour of the relevant Trading Day at a particular Scheduling Point with the ISO Control Area.
- 5.4 Each import of Regulation capacity must be bid with a ramp rate that is less than or equal to the ramp rate that has been certified by the ISO.
 - 5.4.1 The ISO will validate each bid or self-provided amount of Regulation against the certified ramp rate and the certified maximum and minimum capability (Pmax & Pmin), whichever is applicable, of the System Resource.
 - 5.4.2 Bids and self-provision of Regulation that do not comport with the certified ramp rate, Pmax, and Pmin, will be rejected by the ISO during the scheduling process.
 - 5.4.3 The amount of upward Regulation service will be limited by the bid ramp rate (which will be validated to be less than or equal to the certified ramp rate).

- 5.4.4 The amount of downward Regulation service will be limited by the amount of Energy scheduled into the ISO Control Area at the Scheduling Point attributed to the System Resource (and thus establishing its "Dispatch Operating Point" or "DOP") and by the bid ramp rate (which will be validated to be less than or equal to the certified ramp rate) and either the certified or bid operating limits.
- 5.5 All scheduling standards related to the ISO Tariff, WECC Scheduling Practices and NERC Policy 3, as well as any subsequent scheduling and operating standards adopted by WECC and/or NERC, will apply.
- 5.6 The Host Control Area will be identified in the scheduling templates submitted by the Scheduling Coordinator.
- 5.7 Consistent with WECC and NERC requirements, firm transmission capacity must be arranged by the responsible parties on all transmission segments comprising the scheduling path from the System Resource to the pertinent Scheduling Point.

6.0 Real-time Telemetry and Control

- 6.1 All ISO telemetry and control associated with the delivery of imported Regulation service will be received from and sent to the Host Control Area.
- 6.2 The ISO EMS will communicate with the Host Control Area EMS based on the following time standard for Regulation service:
 - 6.2.1 Host Control Area EMS receives ISO EMS control signals on a two-second rate;
 - 6.2.2 Host Control Area EMS issues control signals to, and receives return signals from, the System Resource on a four-second rate;
 - 6.2.3 Host Control Area EMS sends data back to the ISO EMS (including the dynamic interchange associated with the System Resource) on a two-second rate; and
 - 6.2.4 The ISO time standards for Regulation service apply in both the sending and return directions, resulting in a total maximum eight (8) second round trip for signals to travel from the ISO EMS to the System Resource, through the Host Control Area EMS, and back to the ISO EMS.
- 6.3 Control signals issued by ISO EMS:
 - 6.3.1 The Host Control Area EMS will be able to receive control signals (e.g., desired set-point) in real-time, from the ISO EMS, via the ICCP or other agreed-upon protocol, causing the System Resource to vary its Energy production or allocation level from

the prescheduled production level (i.e., the "Dispatch Operating Point" or "DOP") by the amount equal to the difference between the new set-point issued and the DOP, times the ramp rate.

[Note: In the context of this standard, "set-point" may not necessarily refer to the governor set-point of a physical resource, but may rather describe a MW production level or allocation level request sent to a System Resource which is mapped in the Host Control Area EMS.]

6.3.2 For each operating hour for which a System Resource is scheduled to deliver Regulation service, the ISO will provide, at a minimum, via the ICCP or other agreed-upon protocol to the Host Control Area EMS, the following data for each System Resource:

6.3.2.1 MW Set-Point

If the delivered amount is different from the desired System Resource MW in accordance with the ISO's AGC request, the Host Control Area's AGC will cause the delivered amount to be ramped to this value at the specified ramp rate. If this value is outside the specified high or low Regulation limits, ramping will stop when the limit is reached. This value will be supplied every 4 seconds.

6.3.2.2 Regulation Low Limit

Minimum deliverable MW (adjusted for the associated DOP). Deliveries will not be ramped below this limit.

6.3.2.3 Regulation High Limit

Maximum deliverable MW (adjusted for the associated DOP). Deliveries will not be ramped above this limit.

6.3.2.4 Sustained Ramp Rate

Rate at which the actual delivered MW will be ramped to the set-point in MW/minute (as calculated by the ISO AGC, but not faster than the lesser of, the certified or bid ramp rate).

6.4 Telemetry received by ISO EMS

6.4.1 Telemetered quantities of more than one System Resource associated with a particular Host Control Area may not be aggregated (i.e., telemetry received by the ISO EMS must be associated with each prescheduled amount of Regulation capacity that is self-provided or awarded by the ISO to a Scheduling Coordinator in Final Day-Ahead, or Hour-Ahead, schedules for a particular System Resource).

6.4.2 Dynamic interchange attributed to a particular System Resource must be available and telemetered to the ISO EMS from the Host Control Area EMS. Although the System Resource/SC may be certified to import Regulation at more than one ISO Scheduling Point, only one Regulation import schedule may be arranged by the SC from such System Resource during any one operating hour.

6.4.2.1 The telemetered megawatts of dynamic interchange, during the relevant operating hour, must reflect the response of the System Resource to control signals issued by the ISO's EMS to the Host Control Area.

6.4.2.2 Telemetered megawatt-hours of dynamic interchange, at the end of each operating hour, must separately and independently reflect the integrated sum of MW delivered from each System Resource responding to ISO EMS control signals.

6.4.3 For each operating hour for which a System Resource is scheduled to deliver Regulation service, the Host Control Area will provide, at a minimum, via the ICCP or other agreed-upon protocol to the ISO EMS, the following data for each System Resource:

6.4.3.1 On/Off Line Status

"On" if one of the following values is non-zero: MW being delivered, or the Δ delivered MW for the current AGC cycle.

"Off" if both of the foregoing values are zero.

6.4.3.2 On/Off AGC Control Status ("UAGC")

"On" if the System Resource is capable of responding to AGC control, "off" otherwise. When the System Resource is available, this will be "on" unless the Host Control Area's AGC is tripped or suspended. When the System Resource is unavailable, this will be "off."

6.4.3.3 Regulating Energy Being Delivered ("UNMW")

Whenever the ISO sends a new set-point, the Host Control Area's AGC will cause the System Resource to be ramped to the set-point at the specified ramp rate (within the specified low and high limits). Based on the requested set-point and agreed upon ramp rate, the amount of Energy being delivered to the Scheduling Point with the ISO Control Area will be telemetered to the ISO EMS every 4 seconds, and will establish the

dynamic Regulation schedule accounted to the specified ISO Scheduling Point.

6.4.3.4 Operating Low Limit

This will be the Host Control Area's scheduled low limit for the System Resource. This value is the operating point **established by subtracting** the accepted downward Regulation schedule from the operating base point established by an accepted associated Energy import schedule at the relevant Scheduling Point (see Section 5.1.1).

6.4.3.5 Operating High Limit

This will be the Host Control Area's scheduled high limit for the System Resource. This value is the operating point **established by adding** the accepted upward Regulation schedule to the operating base point established by an accepted associated Energy import schedule at the relevant Scheduling Point (see Section 5.1.1).

7.0 Financial Settlements

- 7.1 All ISO financial settlements, including any applicable compliance-related adjustments, are with SCs based on the established and delivered dynamic Regulation schedule, not with the Host Control Area operator or operator/owner of the System Resource.
- 7.2 All ISO financial penalties and sanctions, including any relevant WECC or NERC fines attributed to the ISO, are applicable to SCs based on their established and delivered Regulation schedule, not with the Host Control Area operator or operator/owner of the System Resource.
- 7.3 The ISO has no responsibility or obligation in any financial or after the fact settlements between the Host Control Area operator and the owner/operator of the System Resource. All financial and after the fact settlements with respect to the capacity utilization and Energy production of the pertinent System Resource will be handled directly between the Host Control Area and the resource owner or its appointed representative.
- 7.4 The ISO will include delivered Regulation Energy in the reconciliation of scheduled and metered quantities for the purpose of inadvertent interchange accounting.
- 7.5 The ISO will assess TMM (tie-line meter multipliers), as published in the Hour-Ahead, to all imported Energy associated with Regulation imports.

Scheduling Coordinator & Host Control Area Operator Request for Certification of External Imports of Regulation

In accordance with the California Independent System Operator Corporation ("ISO") Tariff, Protocols and Operating Procedures, and the ISO's "Standards for Imports of Regulation" document, _____, as Scheduling Coordinator, and _____, as Host Control Area operator (as such term is referred to in the ISO's "Standards for Imports of Regulation"), collectively referred to as Parties, or individually as Party, hereby request the certification of the Scheduling Coordinator and the System Resource identified in the table below as a provider of, and the Host Control Area operator as having the ability to facilitate delivery of, regulation service to the ISO Control Area subject to the ISO document "Standards for Imports of Regulation." Further, the Parties acknowledge that the ability of the Scheduling Coordinator to import and of the Host Control Area operator to facilitate delivery of regulation service will be tested for certification in accordance with ISO Operating Procedure G-213.

With this request for certification, the Parties recognize that the ISO Tariff, Protocols, applicable agreements, and the "Standards for Imports of Regulation" document require the Host Control Area operator to respond to ISO control signals by ordering variations in the energy from the Scheduling Coordinator's self-provided or bid external imports of regulation from the System Resource at any time during the operating hour.

With this request for certification, the Host Control Area operator represents and warrants that it has in place the required communications links with the ISO Control Area in order to facilitate the delivery of regulation service 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 delivery of regulation service from the System Resource to the point of interchange ("Scheduling Point") with the ISO Control Area in accordance with the ISO's "Standards for Imports of Regulation" document.

The Scheduling Coordinator further certifies that any and all self-provided or bid imports of regulation will be deliverable over non-interruptible, non-recallable transmission rights, from the source of the external regulation to the Scheduling Point with the ISO Control Area.

System Resource	External Host Control Area in which System Resource is Located	Scheduling Point (ISO interchange ID)	Maximum Amount of Upward Regulation to be Certified (MW)	Maximum Amount of Downward Regulation to be Certified (MW)

Subsequent to the initial filing of this request for certification with the ISO, any prospective changes jointly made by the Parties may be filed with the Scheduling

Coordinator's ISO Client Relations 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 ISO testing proves successful. Such changes will be made by the ISO 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:

[INSERT NAME OF ORGANIZATION]

as the Scheduling Coordinator

By: _____

Name: _____

Title: _____

Date: _____

[INSERT NAME OF ORGANIZATION]

as the Host Control Area Operator

By: _____

Name: _____

Title: _____

Date: _____

CERTIFICATION REQUEST ACKNOWLEDGED by:

California Independent System Operator Corporation