

### **10.3 Meter Service Agreements for ISO Metered Entities.**

#### **10.3.1 Requirement for Meter Service Agreements.**

The ISO shall establish meter service agreements with ISO Metered Entities for the collection of Meter Data. Such agreements shall specify that ISO Metered Entities shall make available to the ISO's revenue meter data acquisition and processing system, Meter Data meeting the requirements of these Sections 10.1 to 10.5 inclusive and the ISO metering protocols. The meter service agreement and the ISO metering protocols shall specify the format of Meter Data to be submitted, which shall be identified by TO, Distribution System, Zone, ISO Controlled Grid interface point and other information reasonably required by the ISO. Meter service agreements will identify other authorized users which are allowed to access the Settlement Quality Meter Data held by the ISO. The ISO will ensure that the relevant UDCs and TOs are included as other authorized users.

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#### **10.6.6 Collection of Meter Data**

**10.6.6.1 Responsibility of Scheduling Coordinators.** Each Scheduling Coordinator shall be responsible for the collection of Meter Data from the Scheduling Coordinator Metered Entities it represents and for ensuring that the Settlement Quality Meter Data supplied to the ISO meets the requirements of this Section 10.6 and the ISO metering protocols.

**10.6.6.2 Certification of Meters.** Scheduling Coordinators shall ensure that revenue meters and related metering facilities of those Scheduling Coordinator Metered Entities whom they represent are certified in accordance with any certification criteria prescribed by the relevant Local Regulatory Authority or, if no such criteria have been prescribed by that Local Regulatory Authority, certified in accordance with the ISO

metering protocols. Scheduling Coordinators shall upon request of the ISO supply promptly copies of all certificates issued by the relevant Regulatory Authority. [The End Use Meters of End Use Scheduling Coordinator Metered Entities of an ISO Metered Entity or a Scheduling Coordinator Metered Entity](#) in place as of the ISO Operations Date ~~are~~is deemed to be certified as in compliance with Appendix J. Once certified, meters for Scheduling Coordinator Metered Entities need not be recertified provided such meters are maintained so as to meet the standards and accuracy requirements prescribed by any relevant Local Regulatory Authority or, if no such standards have been prescribed by that Local Regulatory Authority, such requirements as referred to in Appendix J and the ISO metering protocols. Recertification is not required by the ISO upon an election by a Scheduling Coordinator Metered Entity to change its Scheduling Coordinator from which it takes service.

**10.6.7 Meter Service Agreements [for Scheduling Coordinator Metered Entities](#).**

**10.6.7.1 Requirement for Meter Service Agreements.** The ISO shall enter into meter service agreements with Scheduling Coordinators responsible for providing Settlement Quality Meter Data for Scheduling Coordinator Metered Entities to the ISO. Such agreements shall specify that Scheduling Coordinators require their Scheduling Coordinator Metered Entities to adhere to the meter requirements set forth in this Section 10.6.

**10.6.7.2 [Not Used]**

**10.6.7.3 [Not Used]**

**10.6.7.4 Approval by Local Regulatory Authority of Security and Validation Procedures.** Scheduling Coordinators shall be responsible for obtaining any necessary approval of the relevant Local Regulatory Authority to its proposed security, validation, editing and estimation procedures.

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## **11. ISO SETTLEMENTS AND BILLING.**

### **11.1 Settlement Principles.**

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### **11.2 Calculations of Settlements.**

The ISO shall calculate, account for and settle the following charges in accordance with this ISO Tariff.

#### **11.2.1 Grid Management Charge.**

The Grid Management Charge will be levied in accordance with Section 8 of this ISO Tariff.

#### **11.2.2 Grid Operations Charge.**

The Grid Operations Charge will be levied in accordance with Section 7.3.2 of this ISO Tariff.

#### **11.2.3 Ancillary Services**

The ISO shall calculate, account for and settle charges and payments for Ancillary Services as set out in Sections 2.5.27.1 to 4, and 2.5.28.1 to 4 of this ISO Tariff.

#### **11.2.4 Imbalance Energy.**

The ISO shall calculate, account for and settle Imbalance Energy in the Real Time Market for each Settlement Period for the relevant Zone or Scheduling Point within the ISO Controlled Grid.

##### **11.2.4.1 Net Settlements for Uninstructed Imbalance Energy.**

Uninstructed Imbalance Energy attributable to each Scheduling Coordinator in each Settlement Period in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Uninstructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each Settlement Period equal to the sum of:

(a) The quantity of undelivered Instructed Imbalance Energy, multiplied by the Effective Price, and

(b) The quantity of deviation from the Final Hour-Ahead Schedule multiplied by the Hourly Ex Post Price.

Imbalance Energy charge will be calculated as follows:

$$IE \text{ Charge} = \underline{DevC + ASSEDevC}$$

where

$$\left( \sum_i GenDev_i - \sum_i LoadDev_i \right) * P + \left( \sum_q ImpDev_q \right) * P - \left( \sum_q ExpDev_q \right) * P + UFEC$$

$$DevC = \sum_i GenDevC_i + \sum_i LoadDevC_i + \sum_q ImpDevC_q + \sum_q ExpDevC_q + UFEC$$

$$ASSEDevC = \sum_i ASSEGenDevC_i + \sum_i ASSELoadDevC_i + \sum_q ASSEImpDevC_q$$

where:and

The deviation between scheduled and actual Energy Generation for Generator i represented by the Scheduling Coordinator for the Settlement Period is calculated as follows:

$$GenDev_i = G_s * GMM_f - \left[ (G_a - G_{adj}) * GMM_{ah} - G_{a/s} \right]$$

$$GenDev_i = G_s * GMM_f - \left[ (G_a - G_{adj}) * GMM_{ah} - G_{a/s} - G_{s/e} \right] - UnavailAncServMW_{ixt}$$

$$UnavailAncServMW_{ixt} = \text{Max}[-(G_{i,oblig} - G_{a/s}), \text{Min}(0, P_{max} - G_a - (G_{i,oblig} - G_{a/s}))]$$

$$GenDevC_i = GenDev_i * P \text{ in case of (b) above, and}$$

If  $G_{a/s} + G_{s/e} > 0$  and  $P < P_{eff}$  then:

$$ASSEGenDevC_i = \text{Max}[0, [G_{a/s} - \text{Max}[0, (G_a - G_{adj} - G_s)]]] * (P_{eff-1} - P) \text{ in case of (a) above, or}$$

If  $G_{a/s} + G_{s/e} < 0$  and  $P > P_{eff}$  then:

$$\underline{ASSEGenDevC_i = \text{Min}[0, [G_{a/s} - \text{Min}[0, (G_a - G_{adj} - G_s)]]] * (P_{eff-l} - P) \text{ in case of (a) above}}$$

The deviation between scheduled and actual Load consumption for Load i represented by the Scheduling Coordinator for the Settlement Period is calculated as follows:

$$\underline{LoadDev_i = L_s - [(L_a - L_{adj}) + L_{a/s}]}$$

$$\underline{LoadDev_i = L_s - [(L_a - L_{adj}) + L_{a/s} + L_{s/e}] - UnavailDispLoadMW_{ixt}}$$

Where:

$$\underline{UnavailDispLoadMW_{ixt} = \text{Max}[0, (L_{l\_oblig} - L_{a/s}) - L_a]}$$

$$\underline{LoadDevC_i = LoadDev_i * P \text{ in case of (b) above, and}}$$

If  $L_{a/s} + L_{s/e} > 0$  and  $P < P_{eff}$  then:

$$\underline{ASSELoadDevC_i = \text{Max}[0, [L_{a/s} - \text{Max}[0, (L_a - L_{adj} - L_s)]]] * (P_{eff-l} - P) \text{ in case of (a) above, or}}$$

If  $L_{a/s} + L_{s/e} < 0$  and  $P > P_{eff}$  then:

$$\underline{ASSELoadDevC_i = \text{Min}[0, [L_{a/s} - \text{Min}[0, (L_a - L_{adj} - L_s)]]] * (P_{eff-l} - P) \text{ in case of (a) above}}$$

The deviation between forward, scheduled and Real Time adjustments to Energy imports, adjusted for losses, for Scheduling Point q represented by the Scheduling Coordinator for the Settlement Period is calculated as follows:

$$\underline{ImpDev_q = I_s * GMM_{Iq} - [(I_a - I_{adj}) * GMM_{ahq}] + I_{a/s}}$$

$$\underline{ImpDevC_q = ImpDev_q * P \text{ in case of (b) above, and}}$$

If  $I_{a/s} > 0$  and  $P < P_{eff}$  then

$$\underline{ASSEImpDevC_q = \text{Max}[0, [I_{a/s} - \text{Max}[0, (I_a - I_{adj} - I_s)]]] * (P_{eff-q} - P) \text{ in case of (a) above, or}}$$

If  $I_{a/s} < 0$  and  $P > P_{eff}$  then

$$\underline{ASSEImpDevC_q = \text{Min}[0, [I_{a/s} - \text{Min}[0, (I_a - I_{adj} - I_s)]]] * (P_{eff-q} - P) \text{ in case of (a) above}}$$

The deviation between forward, scheduled and Real Time adjustments to Energy exports for Scheduling Point q represented by the Scheduling Coordinator for the Settlement Period is calculated as follows:

$$\underline{ExpDev}_q = \underline{E_s - E_a - E_{adj}} \quad \underline{ExpDevC}_q = \underline{ExpDev}_q * P$$

and where:

**$G_s$**  = sum of effective schedules for Day-Ahead and Hour-Ahead

**$GMM_f$**  = estimated GMM for Day-Ahead

**$G_a$**  = actual metered Generation

**$G_{adj}$**  = deviations in real time ordered by the ISO for purposes such as Congestion Management

**$GMM_{ah}$**  = hour-ahead GMM (proxy for ex-post GMM)

**$G_{a/s}$**  = Energy generated from Ancillary Service ~~resource or Supplemental Energy~~ resource due to ISO dispatch instruction

**$G_{s/e}$**  = Energy generated from Supplemental Energy resource due to ISO dispatch instruction

**$L_s$**  = sum of Demand scheduled for Day-Ahead and Hour-Ahead

**$L_a$**  = actual metered Demand

**$L_{adj}$**  = Demand deviation in real time ordered by ISO for purposes such as Congestion Management

**$L_{a/s}$**  = Demand reduction from Ancillary Service resource due to ISO dispatch instruction

**$L_{s/e}$**  = Demand reduction from Supplemental Energy resource due to ISO dispatch instruction

**$GMM_{fq}$**  = estimated GMM for an Energy import at Scheduling Point q for Day-Ahead

**$GMM_{ahq}$**  = estimated GMM for an Energy import at Scheduling Point q for Hour-Ahead (proxy for ex-post GMM)

$I_s$  = sum of Scheduled Energy import through Scheduling Point q for Day-Ahead and Hour-Ahead

$I_a$  = sum of actual Energy import through Scheduling Point q.

$I_{adj}$  = deviation in real time import ordered by ISO for purposes such as Congestion Management, and import curtailment.

$I_{a/s}$  = Energy generated from Ancillary Service System Resources pursuant to Existing Contracts or Supplemental Energy from interties due to dispatch instruction

$E_s$  = sum of scheduled Energy export scheduled through Scheduled Point q for Day-Ahead and Hour-Ahead

$E_a$  = sum of actual Energy export through Scheduling Point q [for Day-Ahead and Hour-Ahead](#)

$E_{adj}$  = deviation in real time export ordered by ISO for purposes such as Congestion Management, and export curtailment

$P$  = Hourly Ex Post Price for [Uninstructed](#) Imbalance Energy for the relevant hour, [as defined in Section 2.5.23.2.2](#)

$P_{eff}$  = [Effective Price for Instructed Imbalance Energy for the relevant Settlement Period](#)

$G_{i, oblig}$  = [the amount of Spinning Reserve, the amount of Non-Spinning Reserve, and the amount of Replacement Reserve that Generating Unit or System Resource i has been selected to supply to the ISO, as reflected in final Ancillary Services schedules.](#)

$PMax_i$  = [the maximum capability \(in MW\) at which Energy and Ancillary Services may be scheduled from the Generating Unit or System Resource i.](#)

$L_{i, oblig}$  = [the amount of Non-Spinning Reserve and Replacement Reserve that dispatchable Load i has been selected to supply to the ISO, as reflected in final Ancillary Services schedules for Settlement Period t.](#)

**UFEC** = the Unaccounted for Energy Charge for the Scheduling Coordinator

calculated as follows:

**Unaccounted for Energy Charge**

The hourly Unaccounted for Energy Charge on Scheduling Coordinator j for Settlement Period t for each relevant Zone is calculated in the following manner:

The UFE for each utility service territory k is calculated as follows,

$$E_{UFE\_UDC\_k} = (I_k - E_k + G_k - (RTM_k + LPM_k) - TL_k)$$

The Transmission Loss calculation per Settlement Period t per relevant Zone for each utility service territory k is calculated as follows,

$$TL_k = \sum [G_a * (1 - GMM_{ah})] + \sum [I_a (1 - GMM_{ahq})]$$

Each metered demand point, either ISO grid connected or connected through a UDC, is allocated a portion of the UFE as follows:

$$E_{UFE\_z} = \frac{D_z}{\sum_Z D_z} E_{UFE\_UDC\_k}$$

The UFE charge for Scheduling Coordinator j per Settlement Period per relevant Zone is then,

$$UFEC_j = \left( \sum_z E_{UFE\_z} \right) * P_{xt}$$

Where the terms used in the equations have the following meaning:

**E<sub>UFE\_UDC\_k</sub> -- MWh**

The Unaccounted for Energy (UFE) for utility service territory k.

**E<sub>UFE\_z</sub> -- MWh**

The portion of Unaccounted for Energy (UFE) allocated to metering point z.



**$I_k$  -- MWh**

The total metered imports into utility service territory k in Settlement Period t.

**$E_k$  -- MWh**

The total metered exports from utility service territory k in Settlement Period t.

**$G_k$  -- MWh**

The total metered Generation in Settlement Period t in utility service territory k.

**$RTM_k$  -- MWh**

The Settlement Period t total of the real-time metering in utility service territory k in Settlement Period t.

**$LPM_k$  -- MWh**

The calculated total of the Load Profile metering in utility service territory k per Settlement Period t.

**$TL_k$  -- MWh**

The Transmission Losses per Settlement Period t in utility service territory k.

**$D_z$  -- MWh**

The Demand including Exports in Settlement Period t at metered point z.

The ISO shall develop protocols and procedures for the monitoring of persistent intentional excessive imbalances by Scheduling Coordinators and for the imposition of appropriate sanctions and/or penalties to deter such behavior. ~~The net balance of the charges attributable to all Scheduling Coordinators represents the Transmission Losses imbalance total for each hourly Settlement Period.~~

**11.2.4.1.1 Settlement for Instructed Imbalance Energy**

Instructed Imbalance Energy attributable to each Scheduling Coordinator j in each settlement Period t in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Instructed Imbalance Energy shall

be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each Settlement Period t equal to:

$$\underline{IIEC_t = IGDC_t + ILDC_t + IIDC_t}$$

Where:

Instructed Generation Deviation Payment/Charge is calculated as follows:

$$\underline{IGDC = \sum_{g_i} \frac{G_{g_i} * P_i}{HBI}}$$

Instructed Load Deviation Payment/Charge is calculated as follows:

$$\underline{ILDC = \sum_{L_i} \frac{L_{L_i} * P_i}{HBI}}$$

Instructed Import Deviation Payment/Charge is calculated as follows:

$$\underline{IIDC = \sum_{I_i} \frac{I_{I_i} * P_i}{HBI}}$$

and where:

IGDC = total of instructed Generation deviation payments/charges for the Settlement Period t

ILDC = total of instructed Demand deviation payments/charges for the Settlement Period t

IIDC = total of instructed import deviation payments/charges for the Settlement Period t

G<sub>g</sub> = instructed Energy (in MW) for Generating Unit g during BEEP Interval i

L<sub>L</sub> = instructed Energy (in MW) for Load L during BEEP Interval i

I<sub>I</sub> = instructed Energy (in MW) for import I during BEEP Interval i

P = the BEEP incremental Ex Post Price for BEEP Interval i if the net instructed Energy for resources is positive. Or, the BEEP decremental Ex Post Price for BEEP Interval i if the net instructed Energy for resources is negative

~~HBI~~ the Number (2-12) of BEEP Intervals in the Settlement Period: the maximum number of intervals in the Settlement Period that BEEP can instruct a resource for incremental/decremental Energy.

**11.2.4.2** With respect to Regulatory Must-Take and Regulatory Must-Run Generation, and with respect to Generating Units, Loads and imports which have not bid into the Imbalance Energy markets but which have been dispatched by the ISO to avoid an intervention in market operations or to prevent a System Emergency, the ISO shall calculate, account for and settle deviations from the Final Schedule submitted on behalf of each such Generating Unit, Load or import with the relevant Scheduling Coordinator for each Settlement Period for each such Generating Unit, Load or import by way of the Uninstructed Imbalance Energy Charge price as calculated in accordance with Section 11.2.4.1.

**11.2.4.3 Unaccounted For Energy (UFE)**

UFE is treated as Imbalance Energy. For each Settlement Period, the ISO will calculate UFE on the ISO Controlled Grid, for each UDC Service Area. The UFE will be included in the net settlements for Imbalance Energy in Section 11.2.4.1. UFE attributable to meter measurement errors, load profile errors, Energy theft, and distribution loss deviations will be allocated to each Scheduling Coordinator based on the ratio of their metered Demand (including exports to neighboring Control Areas) within the relevant UDC Service Area to total metered Demand within the UDC Service Area.

**11.2.4.4 [Not Used]**

**11.2.4.5 [Not Used]**

**11.2.4.6 [Not Used]**

**11.2.5 Usage Charges.**

Usage Charges will be levied in accordance with Section 7.3.1 of this Tariff.

**11.2.6 Wheeling Through and Wheeling Out Transactions.**

The ISO shall calculate, account for and settle charges and payments for Wheeling Through and Wheeling Out transactions in accordance with Section 7.1.4 of this Tariff.

**11.2.7 Voltage Support and Black Start Charges.**

The ISO shall calculate, account for and settle charges and payments for Voltage Support and Black Start as set out in Sections 2.5.27.5, 2.5.27.6, 2.5.28.5 and 2.5.28.6 of this ISO Tariff.

**11.2.8 Reliability Must-Run Charges**

The ISO shall calculate and levy the charges for Reliability Must-Run Contract costs in accordance with Section 5.2.7 of this ISO Tariff.

**11.2.9 Neutrality Adjustments**

The ISO shall be authorized to levy additional charges or payments as special adjustments in regard to:

- (a) amounts required to round up any invoice amount expressed in dollars and cents to the nearest whole dollar amount in order to clear the ISO Clearing Account. These charges will be allocated amongst Scheduling Coordinators over an interval determined by the ISO and pro rata based on metered Demand (including exports) during that interval;
- (b) amounts in regard to penalties which may be levied by the ISO in accordance with the ISO Tariff. These charges will be levied on the Market Participants liable for payment of the penalty; and
- (c) amounts required to reach an accounting trial balance of zero in the course of the Settlement process in the event that the charges calculated as due from ISO Debtors are lower than payments calculated as due to the ISO Creditors for the same Trading Day. These charges will be allocated amongst the Scheduling

Coordinators who traded on that Trading Day pro rata to their metered Demand (including exports) in MWh of Energy for that Trading Day. In the event that the charges due from ISO Debtors are higher than the payments due to ISO Creditors, the ISO shall allocate a payment to the Scheduling Coordinators who traded on that Trading Day pro rata to their metered Demand (including exports) in MWh of Energy for that Trading Day.

(d) amounts required with respect to payment adjustments for regulating Energy as calculated in accordance with Section 2.5.27.1. These charges will be allocated amongst the Scheduling Coordinators who traded on that Trading Day pro rata to their metered Demand (excluding exports) in MWh for that Trading Day.

**11.3 Billing and Payment Process.**

**11.3.1 [Not used]**

**11.3.2 [Not used]**

**11.3.3 [Not used]**

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## **16 ISO GRID OPERATIONS COMMITTEE; CHANGES TO ISO PROTOCOLS.**

### **16.1 ISO Grid Operations Committee.**

The ISO Grid Operations Committee shall coordinate activities relating to the ISO Controlled Grid and shall consider suggestions for changes to the ISO Protocols in accordance with the procedures set out in Article IV, Section 4 of the ISO's bylaws.

### **16.2 ISO Protocol Amendment Process**

The ISO Governing Board shall establish an ISO Protocol amendment process in order to ensure that all affected parties have an opportunity to participate. [Under that process, the ISO shall file for acceptance at the FERC any amendment to an ISO Protocol that is on file with the FERC](#)

### **16.3 Market Surveillance: Changes to Operating Rules and Protocols**

The ISO shall keep the operation of the markets that it administers under review to determine whether changes in its operating rules or ISO Protocols would improve the efficiency of those markets or prevent the exercise of market power by any Market Participant; and it shall institute necessary changes in accordance with this Section 16. The details of the ISO Market Monitoring and Information Protocol are set forth in Appendix L, "ISO Protocols".

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## **20 MISCELLANEOUS.**

### **20.1 Notice.**

#### **20.1.1 Effectiveness.**

Any notice, demand, or request in accordance with this ISO Tariff, unless otherwise provided in this ISO Tariff or in any ISO Protocol, shall be in writing and shall be deemed properly served, given, or made: (a) upon delivery if delivered in person, (b) five (5) days after deposit in the mail if sent by first class United States mail, postage prepaid, (c) upon receipt of confirmation by return facsimile if sent by facsimile, or (d) upon delivery if delivered by prepaid commercial courier service.

#### **20.1.2 Addresses.**

Notices to the ISO shall be sent to such address as shall be notified by the ISO to Market Participants from time to time. Notices issued by the ISO to any Scheduling Coordinator shall be delivered to the address of the Scheduling Coordinator included in the SC Application Form. Notices to any Market Participant other than a Scheduling Coordinator shall be delivered by the ISO to the address given to it by the Market Participant. The ISO and any Market Participant may at any time change their address for notice by notifying the other party in writing.

#### **20.1.3 Notice of Changes in Operating Rules and Protocols.**

The ISO shall give all Market Participants notice of at least thirty (30) days of any changes or proposed changes in its operating rules, procedures and protocols, unless: (1) a different notice period is specified by state or Federal law or (2) the change is reasonably required to address an emergency affecting the ISO Controlled Grid or its operations, in which case the ISO shall give Market Participants as much notice as is reasonably practicable. Any notices issued under this provision shall be delivered in

accordance with the procedures set out in Section 20.1 of this ISO Tariff [and, in the case of the ISO Protocols, Section 16.2 of this ISO Tariff.](#)

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