SaMC

Configuration Guide: IFM Marginal Losses Surplus Credit Allocation

**CC 6947**

Version 5.2

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Purpose of Document

The purpose of this document is to capture the requirements and design specification for a SaMC Charge Code in one document.

# Introduction

## Background

The Integrated Forward Market (IFM) design allows CAISO to make efficient use of resources by simultaneously optimizing Energy and AS Bids, which subsequently erases the time/price differential that can exist today. MRTU uses Locational Marginal Pricing (LMP), which is the industry’s preferred method of dealing with transmission traffic jams and determining the least cost method for meeting electricity demand.

MRTU addresses the currently “high” Congestion Costs brought about by bottlenecks from Energy schedules submitted the day before through the use of Full Network Model (FNM) and IFM by identifying lower-cost solutions for Congestion problems.

The CAISO definition of IFM is “a Forward Market for trading Energy, procuring Ancillary Services, determining Unit Commitments, and managing Congestion in a co-optimized fashion”. This charge code will deal only with the Energy portion of the IFM, specifically termed in this document as the Day Ahead Energy.

The LMP prices will consist of three components: Energy, Congestion, and loss. The System Marginal Energy Cost (SMEC) is the same for all nodes in the network. The Marginal Cost of Losses may be positive or negative depending on whether a power ejection at that node marginally increases or decreases losses. The Marginal Cost of Congestion may be positive or negative depending on whether a power ejection at that node marginally increases or decreases Congestion. Incorporating the Marginal Cost of Losses in the LMP is important both for assuring least-cost dispatch and for establishing nodal prices that accurately reflect the cost of supplying the Load at each node. Because marginal losses rise quadratically with transmission system flow, marginal losses will exceed average losses roughly by a factor of two, resulting in surplus collection for losses.

Business Associates with Day Ahead Schedules shall be paid or charged the LMP at the resource location in CC 6011 - Day Ahead Energy, Congestion, Loss Settlement (for IFM DA Schedules) and in CC 6013 - Convergence Bidding DA Energy, Congestion, Loss Settlement (for IFM Virtual Awards). The net of payments and charges for Day Ahead Schedules will comprise the net Congestion and loss revenues. The net Congestion revenues from Day-Ahead Schedules in CC 6011 and from DA Virtual Awards in CC 6013 shall be used to pay CRR entitlement amounts of CRR holders in CC 6700, and any balance or shortfall will be accounted for in CRR Balancing Account in CC 6790. The loss surplus in CC 6011 and CC 6013 will be allocated to Measured Demand through CC 6947, the IFM Marginal Losses Surplus Credit Allocation.

As set in the Tariff, IFM Congestion Credits for ETC/TOR/CVR valid and balanced Self-Schedules as well as TOR loss credits shall be provided. These credits shall be embedded in the congestion revenue calculations of CC 6011.

## Description

This Charge Code rebates to Scheduling Coordinators any loss surplus in the hourly Energy charges in the Day Ahead Market.

For every Trading Hour, the CAISO marginal losses surplus (MLS) is computed as the CAISO total Net Hourly Energy Charge minus the CAISO total IFM Congestion Charge exclusive of Congestion Credits for ETC/TOR/CVR and contract Loss credits to TOR holders. The MLS amount, if any, is then allocated pro-rata to the different SCs based on their Measured Demand in the CAISO Control Area, excluding TOR demand quantity for which IFM and RTM loss credits were provided.

Congestion Credits for CVRs are only applicable through the Transition Period (through 2010).

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
| 1.0 | The IFM Marginal Losses Surplus Credit allocation amount shall be calculated per Business Associate and Trading Hour. |
| 2.0 | The amount of loss surplus in the hourly Energy charges of the IFM to be rebated to each Scheduling Coordinator for each hour is the product of marginal losses surplus (MLS) rate and the non-IFM and non-RTM TOR Measured Demand in the CAISO Control Area for the SC for that hour. |
| 2.1 | Non-IFM and non-RTM TOR Measured Demand is the Measured Demand in the CAISO Control Area excluding TOR demand quantity for which IFM or RTM contract loss credits were provided. |
| 2.2 | IFM and RTM TOR demand quantities for which contract loss credits were provided are calculated in a predecessor charge code. (Fact) |
| 2.3 | For every Trading Hour, the MLS (CAISO total loss surplus in the hourly Energy charge) is computed as the value of:   1. CAISO total Net Hourly Energy Charge minus 2. CAISO total Hourly IFM Congestion Charge,   where both (a) and (b) excludes Congestion credits to ETC/TOR/CVR, and where value in (a) considers Loss credits to TOR. |
| 2.3.1 | The CAISO total Net Hourly Energy Charge is the total charges to all Demand minus the total payments to all Supply, both of which are based on the product of MWh amounts specified in all Day-Ahead Schedules and the relevant LMPs at the applicable PNodes or Aggregated Pricing Node. (Fact) |
| 2.4 | The MLS rate for the hour is the quotient of: (1) the CAISO MLS, and (2) the CAISO hourly non-IFM and non-RTM TOR Measured Demand over Control Area. |
| 2.4.1 | The CAISO hourly non-IFM and non-RTM TOR Measured Demand is the sum of all BA’s Non-IFM and non-RTM TOR Measured Demand. |
| 3.0 | The rounding amount equal to   1. CAISOHourlyDAEnergyMLS **h** computed in this charge code (using inputs from CC 6011 and CC 6013) plus 2. the total among all BAs of MLSCreditAllocation output of CC 6947   shall be calculated at the charge group level and then allocated in CC 4989 or 4999, the Daily Rounding Adjustment Allocation. |
| 4.0 | Advisory settlement from NPM resources: Marginal loss surplus allocation for each SC for each NPM BAA will be computed in this charge code. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Measured Demand over Control Area Pre-calculation |
| ETC/TOR/CVR Quantity Pre-calculation |
| NPM Pre-calculation |
| CC 6011 – Day Ahead Energy, Congestion, Loss Settlement |
| CC 6013 – Convergence Bidding DA Energy, Congestion, Loss Settlement |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| None |

## Inputs - External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
| 1 | None |  |

## Inputs - Predecessor Charge Codes or Pre-calculations

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
|  | BAHourlyMeasuredDemandControlAreaQty Bh | Measured Demand Over Control Area Pre-calculation  Note: This value is assumed negative in the current charge code. |
|  | CAISOBAATotalNetHourlyDAEnergyAmt h | CC 6011 – Day Ahead Energy, Congestion, Loss Settlement |
|  | CAISOTotalNetHourlyDAEnergyCongestionNetOfCreditsAmt h | CC 6011 – Day Ahead Energy, Congestion, Loss Settlement |
|  | CAISOHourlyDAVirtualAwardMinusCongestionAmount h | CC 6013 – Convergence Bidding DA Energy, Congestion, Loss Settlement |
|  | BAHourlyEnergyLossCreditEligibleContractDemandQuantity Bh | ETC/TOR/CVR Quantity Pre-calculation  Note: This value is negative. |
|  | BANPMHourlyMLSDAAllocationAmount **Bmdh** | NPM Pre-calculation |

## CAISO Formula

The pro-rata allocation of marginal loss surplus (MLS) to Scheduling Coordinator B for Trading Hour h

#### MLSCreditAllocation Bh = (IFMMLSRate h x

BAHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ Bh ) + BANPMHourlyMLSDAAllocationAmount **Bh**

BAHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ Bh =

(BAHourlyMeasuredDemandControlAreaQty Bh

- BAHourlyEnergyLossCreditEligibleContractDemandQuantity Bh)

And Where

IF

(CAISOTotalHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ h = 0)

THEN

IFMMLSRate h=0

ELSE

IFMMLSRate h = (-1)\*CAISOHourlyDAEnergyMLS h

/ CAISOTotalHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ h

Where

CAISOHourlyDAEnergyMLS h =

(CAISOBAATotalNetHourlyDAEnergyAmt h

- CAISOTotalNetHourlyDAEnergyCongestionNetOfCreditsAmt h ) +

CAISOHourlyDAVirtualAwardMinusCongestionAmount h

Where

CAISOTotalHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ h =

SUM(B) BAHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ Bh

## Outputs

| Output Req ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
| 1 | IFMMLSRate h | The IFM Marginal Losses Surplus rate for the hour. |
| 2 | CAISOHourlyDAEnergyMLS h | The marginal loss surplus (MLS) credit for the hour to be allocated to SCs. |
| 3 | MLSCreditAllocation Bh | The pro-rata allocation of the MLS credit, to Business Associate B for Trading hour h. |
| 4 | BAHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQBh | The hourly Measured Demand quantity (excluding TOR demand quantities for which contract loss credits were provided) over the CAISO Control Area for Business Associate B and Trading Hour h. The value is used for the allocation of IFM Marginal Losses Surplus Credit to B. |
| 5 | CAISOTotalHourlyMeasuredDemandControlAreaQty\_MLS\_Credit\_BQ h | The hourly Measured Demand over the CAISO Control Area for Trading hour h. The quantity is accumulated over all Business Associates B. The value is used as the allocation base for allocating the total IFM Marginal Losses Surplus Credit. |

# Charge Code References and Internal Comments

## Charge Code Effective Date

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CC 6947 – IFM Marginal Losses Surplus Credit Allocation | 5.0 | 04/01/09 | 01/31/11 | Documentation Edits Only |
| CC 6947 – IFM Marginal Losses Surplus Credit Allocation | 5.1 | 02/01/11 | 12/31/20 | Documentation Edits and Configuration Impacted |
| CC 6947 – IFM Marginal Losses Surplus Credit Allocation | 5.2 | 01/01/21 | 4/30/26 | Configuration Impacted |