Settlements and Billing

Configuration Guide:

CC 6678

Version 5.4

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# Purpose of Document

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

# Introduction

## Background

Bid Cost Recovery (BCR) is the process by which the CAISO ensures Scheduling Coordinators (SCs) are able to recover Start Up Costs (SUC), Minimum Load Costs (MLC), Transition Costs (TC), and Energy Bid Costs. In order to recover SUC and MLC, a Generating Unit, Pumped-Storage Unit, or resource-specific System Resource must be committed by the CAISO. Likewise, the CAISO must commit a Multi-Stage Generating Resource in order for it to receive TC compensation. Bid Cost recovery for Energy and Ancillary Services (A/S) Bids applies to Bid Cost Recovery Eligible Resources in general (for example, Generating Units, Pumped-Storage Units, Proxy Demand Resources, and System Resources) scheduled or dispatched by CAISO, independent of whether they are CAISO-committed or instead are self-committed.

For purposes of determining BCR eligibility, CAISO uses a concept called Commitment Period. A Commitment Period consists of the consecutive time periods within a Trading Day when a resource is on-line, synchronized to the grid, and available for dispatch. A Commitment Period is comprised of two distinct sub-types --- Self-Commitment Period and CAISO Commitment Period. The portion of a Commitment Period where a resource submits an Energy Self-Schedule or A/S self provision is called a Self-Commitment Period. A Self-Commitment Period may include time periods when a resource is not operating pursuant of an Energy Self-Schedule or A/S self-provision, but must be on due to Ramping Constraints or a minimum up time or minimum down time requirement. Resources are not eligible for BCR of SUC, MLC or TC during Self-Commitment Periods, but are eligible for BCR of awarded Energy and A/S. The portion of a Commitment Period that is not a Self-Commitment Period is called CAISO Commitment Period. Resources are eligible to receive BCR for SUC, MLC, TC, awarded Energy and A/S during a CAISO Commitment Period.

For each resource, the total SUC, MLC, TC, Bid Costs together with the energy and AS bid costs, and market revenues from RUC, and RTM are netted together for each Settlement Interval. If the difference between the total costs and the market revenues is positive in the relevant market, then the net amount represents a Shortfall. If the difference is negative in the relevant market, the net amount represents a Surplus. For each resource or, in the case of a MSS entity that has elected net settlement, all MSS resources collectively, the RUC, and RTM Shortfalls and Surpluses are then netted over all hours of a Trading Day. Net Surpluses from either of the RUC or RTM markets offset any net shortfalls from the other market over the entire Trading Day. If the net Trading Day amount is positive (a Shortfall), the Scheduling Coordinator receives a BCR Uplift Payment equal to the net Trading Day amount.

For IFM the total SUC, MLC, TC, Bid Costs, and market revenues for each resource are netted together for each Settlement Interval. If the difference between the total costs and the market revenues is positive, then the net amount represents a Shortfall. If the difference is negative in the relevant market, the net amount represents a Surplus. For each resource or, in the case of a MSS entity that has elected net settlement, all MSS resources collectively, the IFM Shortfalls and Surpluses are then netted over all hours of a Trading Day. If the net Trading Day amount is positive (a Shortfall), the Scheduling Coordinator receives a BCR Uplift Payment equal to the net Trading Day amount.

While there is a single bid cost recovery payment per resource (or net-settled MSS entity) per Trading Day for the IFM market and a separately calculated single payment for the combined RUC and RTM markets per resource and Trading Day, the associated charge allocation is calculated separately on a Trading Hour basis for each of the IFM, RUC and RTM markets. For the RTM market, the RTM Bid Uplift Costs are allocated to Business Associates in proportional to their Measured Demand plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour.

## Description

This charge code settles on an hourly basis, allocating the total amount of CAISO Total RTM Bid Uplift Costs to each Business Associate proportionately to its Measured Demand for the Trading Hour or Net Negative Uninstructed Deviation plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour.

For non-MSS entities, the allocation will be in proportion to Measured Demand plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour. For MSS entities that have elected to both not follow their Load and gross settlement, the allocation to the MSS entity will be in proportion to their Measured Demand plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour. For MSS entities that have elected to both not follow their Load and net settlement, the allocation will be in proportion to their MSS Aggregation Net Measured Demand plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour. For MSS entities that have elected to follow their Load, regardless of gross or net, the allocation will be in proportion to their Net Negative Uninstructed Deviation with Load Following including in the netting plus any FMM reductions not associated with ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
|  | CAISO total Uplift Allocation Amount will be summed for all Settlement intervals in the Trading Hour and allocated in this Charge Code on an hourly basis. |
|  | For the CAISO Balancing Authority Area, the CAISO will compute the hourly Net RTM Bid Cost Uplift for the Trading Hour as the product of the RTM uplift ratio and the sum over all of the Settlement Intervals of the Trading Hour of any positive Net RTM Bid Cost Uplift, as determined by the BCR sequential netting calculation. *(Fact)* |
|  | The hourly RTM Bid Cost Uplift in the CAISO Balancing Authority Area is allocated to Scheduling Coordinators, including Scheduling Coordinators for MSS Operators that have elected (a) not to follow their Load, and (b) gross Settlement, in proportion to their Measured Demand plus any FMM reductions not associated with valid and balanced ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market for the Trading Hour. |
|  | For Scheduling Coordinators for MSS Operators that have elected (a) not to follow their Load, and (b) net Settlement, the hourly RTM Bid Cost Uplift is allocated in proportion to their MSS Aggregation Net Measured Demand plus any FMM reductions not associated with valid and balanced ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market. |
|  | For Scheduling Coordinators of MSS Operators that have elected to follow their Load, the RTM Bid Cost Uplift shall be allocated in proportion to their MSS Net Negative Uninstructed Deviation plus any FMM reductions not associated with valid and balanced ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market. |
|  | Load Following Energy for the MSS shall include FMM self-schedule energy that is provided by a System Resource for the purpose of load-following in accord with an associated MSS Agreement between CAISO and the MSS. |
|  | Each Scheduling Coordinator shall be charged an amount equal to the product of (a) the sum of its Measured Demand, (or in the case of a Load Following MSS) its MSS Net Negative Uninstructed Deviation, and any FMM reductions not associated with valid and balanced ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market and (b) the RTM Bid Cost Uplift rate. |
|  | The RTM Bid Cost Uplift rate is computed as the Net RTM Bid Cost Uplift amount divided by the sum of Measured Demand and any NSS Net Negative Uninstructed Deviation applicable to a Load Following MSS, plus any FMM reductions not associated with valid and balanced ETCs, TORs or Converted Rights Self-Schedules in the Day-Ahead Market across all Scheduling Coordinators for the Trading Hour. |
|  | Any real-time reductions after HASP results are published to HASP Block Intertie Schedules in response to Dispatch Instructions or real-time scheduling curtailments are not allocated any Net RTM Bid Cost Uplift. |
| 3.0 | PTB Allocation Logic does not apply to this Charge Code. |
| 4.0 | The net imbalance amount calculated as the sum of the final Settlement Amount for Charge Codes 6620, 6636, 6637, 6800, 6806, 6807, 6678, and 6824 in a given Trading Day is attributed to rounding and must be output to CC 4989 Daily Rounding Adjustment Allocation for settlement. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calc – Real Time Energy |
| Pre-calc – Bid Cost Recovery Sequential Netting |
| Pre-calc – Measured Demand Over Control Area |
| CC 6460 – FMM Instructed Imbalance Energy Settlement |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 4989 Daily Rounding Adjustment Allocation |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| 1 | MSSResourceInfo BrtuT’I’M’AA’VL’pmd | A flag input created by data mapping from Master File information that has a value of 1 for a MSS resource and a value of 0 for a non-MSS resource. This variable contains the information link between resource ID r and a combination of associated UDC/MSS entity u and MSS subgroup M’ values together with values of some other UDC/MSS attributes related to u and M’. For either a UDC or MSS entity, other attributes for which values are provided include the Business Associated B, entity type T’, Aggregated Pricing Node A and Aggregated Pricing Node Type A’. For cases where T’ = ‘MSS’, u will be associated with the attributes gross/net settlement type I’ RUC Participation Flag V, and Load Following Flag L’ that specify MSS operational or settlement selections. For a case where M’ is NULL (i.e., a MSS subgroup either does not exist for a MSS in a case where T’ = ‘MSS’ or does not apply to a UDC in a case where T’ = ‘UDC’), the other mapped attributes, if they exist, apply to u instead of u and M’. The input applies to a given Trading Day. |

## Inputs - Predecessor Charge Codes or Pre-calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
| 1 | BAHourlyResourceImportHASPReductionMW BrtuQ’T’I’M’F’S’mdh | PC – Real Time Energy Quantity |
| 2 | CAISOTotalRTMUpliftAllocationAmount mdhcif | Pre-calc – Bid Cost Recovery Sequential Netting |
| 3 | BAHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR Bmdh | Pre-calc – Measured Demand Over Control Area  Hourly Measured Demand represented as negative value less applicable TOR quantities and Exemption #6 (as defined in MD Over Control Area Pre-calc) in which the Measured Demand quantity for non-MSS entities and non-Load Following MSS gross election entities is Measured Demand. For non-Load Following MSS net election entities the quantity is MSS Aggregation Net Measured Demand by Business Associate and Trading Hour. |
| 4 | SettlementIntervalRealTimeUIE BrtuT’I’Q’M’F’S’mdhcif | Pre-calc – Real Time Energy |
| 5 | SettlementIntervalMSSIIE BrtuT’I’Q’M’F’S’mdhcif | Pre-calc – Real Time Energy |
| 6 | SettlementIntervalSystemResourceMSSLFEngy BrtuT’I’M’F’S’mdhcif | Pre-calc – Real Time Energy |
| 7 | SettlementIntervalFMMMSSLFSelfSchdEngy BrtuT’I’M’F’S’mdhcif | Pre-calc – Real Time Energy |

## CAISO Formula

### The RTM BCR Charge is as follows:

RTMBCRAllocationCharge Bmdh =

(-1) \* BAHourlyTotalRTMUpliftAllocationQuantity Bmdh \*

RTMBCRUpliftAllocationRate mdh

### RTMBCRUpliftAllocationRate mdh =

If CAISOHrlyTotalRTMUpliftAllocationQuantity mdh<> 0

Then

RTMBCRUpliftAllocationRate mdh=

CAISOHrlyTotalRTMUpliftAllocationAmount mdh/

((-1) \* CAISOHrlyTotalRTMUpliftAllocationQuantity mdh)

Else

RTMBCRUpliftAllocationRate mdh= 0

End If

### CAISOHrlyTotalRTMUpliftAllocationQuantity mdh=

CAISOHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR mdh  
–   
CAISOHourlyImportFMMReductionForRTMUpliftAllocationQuantity mdh

CAISOHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR mdh=

(BAHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR Bmdh  
+

BAHourlyMSSLoadFollowingNetNegativeDeviationRTMUpliftAllocationQuantity Bmdh)

CAISOHourlyImportFMMReductionForRTMUpliftAllocationQuantity mdh=

BAHourlyImportFMMReductionForRTMUpliftAllocationQuantity Bmdh

### BAHourlyTotalRTMUpliftAllocationQuantity Bmdh =

BAHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR Bmdh + BAHourlyMSSLoadFollowingNetNegativeDeviationRTMUpliftAllocationQuantity Bmdh - BAHourlyImportFMMReductionForRTMUpliftAllocationQuantity Bmdh

### BAHourlyMSSLoadFollowingNetNegativeDeviationRTMUpliftAllocationQuantity Bmdh =

Min(0, BAHourlyMSSLoadFollowingUIE\_ForRTMUpliftAllocationQuantity Bmdh + BAHourlySystemResourceMSSLFEngy Bmdh)

### BAHourlyMSSLoadFollowingUIE\_ForRTMUpliftAllocationQuantity Bmdh =

(BAHourlyUIE\_ForRTMUpliftAllocationQuantity BrtuT’I’M’mdh \* MSSResourceInfo BrtuT’I’M’AA’VL’pmd)

Where Load Following Flag L’ = ‘YES’

### BAHourlyUIE\_ForRTMUpliftAllocationQuantity BrtuT’I’M’mdh =

(SettlementIntervalRealTimeUIE BrtuT’I’Q’M’F’S’mdhcif +

SettlementIntervalMSSIIE BrtuT’I’Q’M’F’S’mdhcif)

### BAHourlySystemResourceMSSLFEngy Bmdh =

SettlementIntervalSystemResourceMSSLFEngy BrtuT’I’M’F’S’mdhcif

### BAHourlyImportFMMReductionForRTMUpliftAllocationQuantity Bmdh =

Sum (r,t,u,Q’,T’,I’,M’,F’,S’) (BAHourlyResourceImportHASPReductionMW BrtuQ’T’I’M’F’S’mdh – BAHrlyResImportFMMLFReductionMW BrtuT’I’M’F’S’mdh)

Where Q’ = CISO

### BAHrlyResImportFMMLFReductionMW BrtuT’I’M’F’S’mdh =

(-1) \* Min(BAHrlyResImportFMMLFSSEQuantity BrtuT’I’M’F’S’mdh, 0)

### BAHrlyResImportFMMLFSSEQuantity BrtuT’I’M’F’S’mdh =

SettlementIntervalFMMMSSLFSelfSchdEngy BrtuT’I’M’F’S’mdhcif

### CAISOHrlyTotalRTMUpliftAllocationAmount mdh=

CAISOTotalRTMUpliftAllocationAmount mdhcif

## Outputs

| Output ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
| 1 | RTMBCRAllocationCharge Bmdh | The Real Time Bid Cost Uplift Allocation amount (in $) for a given Business Associate and Trading Hour. |
| 2 | RTMBCRUpliftAllocationRate mdh | The RTM Bid Cost Uplift Allocation rate ($/MWh) for a given Trading Hour. |
| 3 | CAISOHrlyTotalRTMUpliftAllocationQuantity mdh | The total RTM Bid Cost Uplift Allocation quantity (in MWh) to be allocated in CC6678 for a given Trading Hour. |
| 4 | CAISOHourlyMeasuredDemandMinusRightsQuantity\_NON\_LF\_EX\_RTM\_BCR mdh | CAISO-wide hourly Measured Demand (in MWh) for a given Trading Hour. The output is represented as a negative value. For non-MSS entities and non-Load Following MSS gross election entities the output includes each of their Measured Demand values. For non-Load Following MSS net-settlement election entities the output includes each of their MSS Aggregation Net Measured Demand values. The output excludes all Measured Demand associated with any balanced TOR-scheduled Energy and/or associated with the BA\_ID and resource members of Exception Set #6 (as defined in MD Over Control Area Pre-calc). |
| 5 | CAISOHourlyImportFMMReductionForRTMUpliftAllocationQuantity mdh | The CAISO-wide FMM reversal quantity (in MWh) for Energy import schedules. The input quantity is calculated over all Energy import schedules for a given Trading Hour. |
| 6 | BAHourlyTotalRTMUpliftAllocationQuantity Bmdh | The hourly RTM Bid Cost Uplift Allocation quantity (in MWh) for a given Business Associate and Trading Hour. |
| 7 | BAHourlyMSSLoadFollowingNetNegativeDeviationRTMUpliftAllocationQuantity Bmdh | The Net Negative Uninstructed Deviation quantity (in MWh), including Load Following Energy associated with MSS entities that have elected to follow their Load, for a given Business Associate and Trading Hour. |
| 8 | BAHourlyMSSLoadFollowingUIE\_ForRTMUpliftAllocationQuantity Bmdh | The hourly Uninstructed Deviation quantity (in MWh) including Load Following Energy associated with MSS entities that have elected to follow their Load by Business Associate and Trading Hour. |
| 9 | BAHourlyUIE\_ForRTMUpliftAllocationQuantity BrtuT’I’M’mdh | The hourly Uninstructed Deviation quantity (in MWh) for MSS and non-MSS entities for a given Business Associate and Trading Hour. |
| 10 | BAHourlySystemResourceMSSLFEngy Bmdh | The hourly MSS Load Following Energy (in MWh) contributed by System Resources for a given Business Associate and Trading Hour. |
| 11 | BAHourlyImportFMMReductionForRTMUpliftAllocationQuantity Bmdh | FMM Reduction quantity (in MWh) for Energy import schedules for a given Business Associate and Trading Hour. |
| 12 | BAHrlyResImportFMMLFReductionMW BrtuT’I’M’F’S’mdh | FMM Reduction quantity (in MWh) attributable to Load Following Energy for a given resource and Trading Hour. |
| 13 | BAHrlyResImportFMMLFSSEQuantity BrtuT’I’M’F’S’mdh | FMM Load Following Energy (in MWh) for a given MSS resource and Trading Hour. |
| 14 | CAISOHrlyTotalRTMUpliftAllocationAmount mdh | The total RTM Bid Cost Uplift amount (in $) to be allocated in CC6678 for Trading Hour h. |

# Charge Code Effective Date

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.0 | 04/01/09 | 07/31/10 | Documentation Edits Only |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.0a | 08/01/10 | 9/30/10 | Documentation Edits Only |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.0b | 10/01/10 | 01/31/11 | Documentation Edits Only |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.1 | 02/01/11 | 12/31/11 | Configuration Impacted |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.2 | 01/01/12 | 04/30/14 | Configuration Impacted |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.3 | 05/01/14 | 09/30/14 | Configuration Impacted |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.4 | 10/01/14 | 4/30/26 | Documentation Edits Only |
| CC 6678 – Real Time Bid Cost Recovery Allocation | 5.5 | 5/1/26 | Open | Configuration Impacted |