Settlements & Billing

Configuration Guide: Bid Cost Recovery Sequential Netting

**Pre-calculation**

 Version 5.3

Table of Contents

1. Purpose of Document 3

2. Introduction 3

2.1 Background 3

2.2 Description 4

3. Charge Code Requirements 4

3.1 Business Rules 4

3.2 Predecessor Charge Codes 8

3.3 Successor Charge Codes 8

3.4 Inputs – External Systems 8

3.5 Inputs – Predecessor Charge Codes or Pre-Calculation 9

3.6 CAISO Formula 10

3.7 Outputs 21

4. Charge Code Effective Date 29

# Purpose of Document

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

# Introduction

## Background

Bid Cost Recovery (BCR) is the process by which the CAISO ensures SCs are able to recover Start-Up Costs (SUC), Minimum Load Costs (MLC), MSG Resource 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 within the EIM Area 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 resource-specific 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 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 Run 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 a CAISO Commitment Period. Resources are eligible to receive BCR for SUC, MLC, TC, awarded Energy and A/S during a CAISO Commitment Period.

SUC, MLC and TC for each market and resource are determined in Pre-calculation Start-Up and Minimum Load Cost. The commitment costs together with the energy and AS bid costs are then used as inputs to calculate a resource’s net difference between costs and revenues in separate Pre-calculations by market --- IFM Net Amount, RUC Net Amount, and RTM Net Amount. Only resources that participated in the respective markets will be qualified to be eligible for BCR in those markets, EIM BAA resources which participate in the EIM, participates only in RTM market, and not the IFM nor the RUC markets. 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 IFM, RUC, and RTM Shortfalls and Surpluses are then netted over all hours of a Trading Day, with the IFM Shortfalls and Surpluses netted separately from the RUC and RTM Shortfalls and Surpluses. Thus, RUC or RTM surpluses over the entire Trading Day are used to offset a RTM or RUC shortfall, respectively, incurred over the entire Trading Day. For either IFM or the combined RUC and RTM netting, if the net amount over the Trading Day is positive (a Shortfall), then the resource or net-settled MSS entity receives a BCR Uplift Payment equal to the net Trading Day amount under CC 6620 – RUC and RTM Bid Cost Recovery Settlement (for a combined RUC and RTM shortfall), or CC 6630 IFM Bid Cost Recovery Settlement (for an IFM shortfall).

## Description

BCR Sequential Netting Pre-calculation will perform the calculations necessary to implement the business rules identified in the Business Rules section below.

This Pre-calculation executes the sequential netting of the relevant amounts to calculate the IFM, RUC and RTM Uplift Allocation Amounts used by the successor Charge Codes: CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation, CC 6806 – DA RUC Tier 1 Allocation and (both CC 6678 and CC 66780) – Real Time Bid Cost Recovery Allocation, respectively.

To avoid commingling uplifts for BCR across BAAs, the calculations will be isolated to each BAA. The exception is the EIM transfers across BAA, which could be a reduction of uplift cost for a BAA with EIM transfer out, or could be an addition to uplift cost for a BAA with EIM transfer in.

Though the calculations in this charge code are generalized, it will be seen in successor charge codes that the EIM Entity SC shall receive only the corresponding RTM uplift allocation for its BAA (through CC 66780), while SCs within the CAISO BAA, with Measured Demand shall continue to receive the IFM, RUC, and RTM uplift allocation.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
|  | For each BAA in the WEIM Area, the Total Surplus and Shortfall Amounts for each market and Settlement Interval is a summation of the applicable net market amounts of only those units within that BAA which received a BCR Payment.  |
|  | The summation of net amounts for each Settlement Interval and market is either a Shortfall (positive) or Surplus (negative), never both. |
|  | In the business rules, the IFM market calculations apply only to CAISO and EDAM BAAs. |
|  | In the business rules, the RUC market calculations apply only to CAISO and EDAM BAAs. |
|  | In the business rules, the RTM market calculations apply to all BAA in the EIM Area. |
|  | IFM Shortfalls and Surpluses of resources which received a BCR Payment under CC 6630 will be netted separately from the RUC and RTM shortfalls and surpluses. In other words, IFM shall not be netted with the RUC and RTM. |
|  | Any positive Net IFM Bid Cost Uplifts are reduced by scaling them with an IFM uplift ratio to determine the Total IFM Uplift in accord with the following rules: |
|  | 1. The Total IFM Uplift is the Net IFM Bid Cost Uplift for all Settlement Intervals in the IFM Market.
 |
|  | 1. The Total Positive IFM Uplift is determined as the sum of the positive IFM Bid Cost Uplift for all Settlement Intervals in the IFM Market.
 |
|  | 1. The IFM uplift ratio is equal to the Total IFM Uplift divided by the Total Positive IFM Uplift.
 |
|  | The CAISO will determine the Net RUC Bid Cost Uplift and the Net RTM Bid Cost Uplift to be allocated to each Balancing Authority Area in the EIM Area as follows: |
|  | 1. For each Balancing Authority Area separately, the CAISO will calculate a combined RUC Bid Cost Uplift and RTM Bid Cost Uplift amount based on RUC Bid Cost Shortfall, RUC Bid Cost Surplus, RTM Bid Cost Shortfall, and RTM Bid Cost Surplus of each supply resource located within the Balancing Authority Area for each Settlement Interval.
 |
|  | 1. For each Balancing Authority Area separately, for each Trading Day, the CAISO will calculate a daily combined total RUC Bid Cost Uplift and RTM Bid Cost Uplift amount as the sum of all the Settlement Interval values calculated according to (i).
 |
|  | 1. For each Balancing Authority Area separately, for each Trading Day, the CAISO will calculate a combined total positive RUC Bid Cost Uplift and RTM Bid Cost Uplift amount as the sum of the positive Settlement Interval values calculated according to (i).
 |
|  | 1. The CAISO will calculate the daily uplift ratio for the RUC and RTM, for each Balancing Authority Area in the EIM Area, as the daily combined total RUC Bid Cost and RTM Bid Cost amount, calculated according to (ii), divided by the daily combined total positive RUC Bid Cost Uplift and RTM Bid Cost Uplift, calculated according to (iii).
 |
|  | 1. For each Settlement Interval and each Balancing Authority Area in the EIM Area, the CAISO will multiply the applicable daily uplift ratio with each combined total positive RUC Bid Cost Uplift and each combined total RTM Bid Cost Uplift to determine the Net RUC Bid Cost Uplift and the preliminary Net RTM Bid Cost Uplift, respectively, for each Balancing Authority Area.
 |
|  | 1. The CAISO shall adjust the preliminary Net RTM Bid Cost Uplift amounts calculated in (v) by
 |
|  | 1. dividing the sum of net EIM Transfers out of a Balancing Authority Area by the sum of the absolute value of Uninstructed Imbalance Energy due to Demand, the absolute value of Uninstructed Imbalance Energy due to Supply, the absolute value of Unaccounted For Energy, and the net EIM Transfer out of the Balancing Authority Area;
 |
|  | 1. multiplying the preliminary Net RTM Bid Cost Uplift amounts by the ratio calculated in (vii); and
 |
|  | 1. reducing the preliminary Net RTM Bid Cost Uplift amounts of the EIM Entity Balancing Authority Area with the net transfer out by the amount calculated in (viii) and adding that amount to the EIM Entity Balancing Authority with the net transfer in to determine the final preliminary Net RTM Bid Cost Uplift amounts.
 |
|  | 1. For each Settlement Interval, the Net RUC Bid Cost Uplift and final Net RTM Bid Cost Uplift apportionment by Settlement Interval for each Balancing Authority Area in the EIM Area will be the sum of the amounts calculated in (v) and, for Net RTM Bid Cost Uplift only, (ix) for each Balancing Authority Area in the EIM Area.
 |
|  | The “net transfer in” BCR uplift amount in (ix) above, which applies to any BAA with a net transfer in is calculated as follows: |
|  | For each settlement interval, net transfer out BCR uplift amounts identified in item (ix) above are added over the entire EIM Area, to come up with the Total transfer out BCR amount. This is the amount that needs to be shared among all BAA with net transfer in. |
|  | For each BAA with a net transfer in (or import MWh), the corresponding allocation ratio is the net transfer in MWh to the total transfer out MWh (which is also equivalent to the total transfer in MWh) within the EIM Area. In other words, this ratio is multiplied with Total transfer out BCR amount to get the net transfer in BCR uplift amount. |
|  | The hourly Net RUC Bid Cost Uplift is computed for the Trading Hour as the product of the combined RUC and RTM uplift ratio and the sum over all Settlement Intervals of the Trading Hour of any positive Net RUC Bid Cost Uplift, as determined by the BCR sequential netting calculation. |
|  | The hourly Net RTM Bid Cost Uplift is computed for the Trading Hour as the product of the combined RUC and RTM uplift ratio and the sum over all Settlement Intervals of the Trading Hour of any positive Net RTM Bid Cost Uplift, as determined by the BCR sequential netting calculation. |
|  | RUC BCR Adjustments and Allocations:The RUC Uplift amount after the sequential netting with RTM Uplift produces a preliminary RUC uplift amount. This amount is further subject to adjustments (reduction) for costs of RUC reliability capacity Net Transfer Out of each BAA, and allocation (addition) for costs of RUC reliability capacity Net Transfer Into each BAA. |
|  | For each BAA, RUC Net Transfer Out results when total RCU award minus total RCD award for all resources within the BAA is positive. |
|  | For each BAA, RUC Net Transfer In results when total RCU award minus total RCD award for all resources within the BAA is negative. |
|  | For each BAA, the adjustments is computed as the preliminary RUC uplift multiplied by the ratio of a) RUC Net Transfer Out and b) the sum of RUC Net Transfer Out and Measured Demand. |
|  | For each BAA, the allocation from the total adjustments costs in the previous rule across the EIM Area multiplied by the share of the BAA’s from RUC Net Transfer In to the EIM Area’s RUC Net Transfer In. |
|  | This Pre-calculation is a daily computation generating results on a Settlement Interval basis. |
|  | Pass Through Bill Charge Adjustment Logic does not apply. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 6011 – Day Ahead Energy, Congestion, Loss Settlement |
| CC 6013 – Convergence Bidding DA Energy\_Cong\_Loss Settlement |
| CC 6620 – RUC and RTM Bid Cost Recovery Settlement |
| CC 6630 – IFM Bid Cost Recovery Settlement |
| CC 8071 – Day Ahead Imbalance Reserve Up Settlement |
| CC 8081 – Day Ahead Imbalance Reserve Down Settlement |
| Pre-calc – IFM Net Amount |
| Pre-calc – RUC Net Amount |
| Pre-calc – RTM Net Amount |
| Pre-calc – RT Energy |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 6636 – IFM Bid Cost Recovery Tier 1 Allocation |
| CC 8826 –RUC Reliability Capacity Up Tiered Allocation |
| CC 6678 – Real Time Bid Cost Recovery Allocation |
| CC 66780 –Real Time Bid Cost Recovery Allocation EIM |

## Inputs – External Systems

|  |  |  |
| --- | --- | --- |
| Row # | Variable Name | Description |
|  | BAEDAMEntityFlag **BQ’md** | Flag indicating an EIM entity that specifically participates in EDAM. |
|  | BAATransferSystemResourceFromDAEnergyQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer From Quantity of DA Energy for resource r and Pricing Node p |
|  | BAATransferSystemResourceToDAEnergyQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer To Quantity of DA Energy for resource r and Pricing Node p |
|  | BAATransferSystemResourceFromDAImbalanceReserveUpQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer From Quantity of DA Imbalance Reserve Up for resource r and Pricing Node p |
|  | BAATransferSystemResourceToDAImbalanceReserveUpQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer To Quantity of DA Imbalance Reserve Up for resource r and Pricing Node p |
|  | BAATransferSystemResourceFromDAImbalanceReserveDownQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer From Quantity of DA Imbalance Reserve Down for resource r and Pricing Node p |
|  | BAATransferSystemResourceToDAImbalanceReserveDownQty BrQ’AA’QpNz’mdh | Balancing Authority Area Transfer To Quantity of DA Imbalance Reserve Down for resource r and Pricing Node p |

## Inputs – Predecessor Charge Codes or Pre-Calculation

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
|  | BAATradingDayRUCandRTMBCRUpliftAmount BrQ’uT’I’M’F’md | CC 6620 – RUC and RTM Bid Cost Recovery Settlement |
|  | BAATradingDayMSSNetRUCandRTMBCRUpliftAmount BQ’T’I’M’md | CC 6620 – RUC and RTM Bid Cost Recovery Settlement |
|  | IFMNetAmount BrQ’uT’I’M’F’**mdhcif** | Pre-calc – IFM Net Amount |
|  | IFMMSSNetBCRAmount BQ’T’I’M’**mdhcif** | Pre-calc – IFM Net Amount |
|  | BAARUCNetAmount BrQ’uT’I’M’F’**mdhcif** | Pre-calc – RUC Net Amount |
|  | BAARUCMSSNetBCRAmount BQ’T’I’M’**mdhcif** | Pre-calc – RUC Net Amount |
|  | BAARTMNetAmount BrQ’uT’I’M’F’**mdhcif** | Pre-calc – RTM Net Amount |
|  | BAARTMMSSNetBCRAmount BQ’T’I’M’**mdhcif** | Pre-calc – RTM Net Amount |
|  | TradingDayIFMBCRUpliftAmount BrQ’uT’I’M’F’md | CC 6630 – IFM Bid Cost Recovery Settlement |
|  | TradingDayIFMBCRMSSNetUpliftAmount BQ’T’I’M’md | CC 6630 – IFM Bid Cost Recovery Settlement |
|  | BAAEIMTransferOutPercentage **Q’mdhcif** | Pre-calc - RT Energy |
|  | BAAEIMTransferInPercentage **Q’mdhcif** | Pre-calc - RT Energy |
|  | BAHourlyResRCUAwardedQuantity BrtQ’F’S’mdh | CC 8800 - Day Ahead RUC Reliability Capacity Up Settlement |
|  | BAHourlyResRCDAwardedQuantity BrtQ’F’S’mdh | CC 8810 - Day Ahead RUC Reliability Capacity Down Settlement |
|  | BAASettlementIntervalEIMAreaMeasuredDemandQuantity Q’mdhcif  | PC – MSS Netting |
|  | BAATotalHourlyDAVirtualDemandAwardQuantity **Q'mdh** | CC 6013 – Convergence Bidding DA Energy\_Cong\_Loss Settlement |
|  | HourlyResourceDayAheadEnergy **BrtuT’I’Q’M’F’S’mdh** | CC 6011 – Day Ahead Energy, Congestion, Loss Settlement |
|  | BAHourlyResIRUScheduleQuantity **BrtQ’mdh** | CC 8071 – Day Ahead Imbalance Reserve Up Settlement |
|  | BAHourlyResIRDScheduleQuantity **BrtQ’mdh** | CC 8081 – Day Ahead Imbalance Reserve Down Settlement |

## CAISO Formula

The formulas are grouped into IFM Uplift Allocation Amounts, RUC/RTM uplift allocation amounts and are shown in sequence of calculation, instead of drill down calculations.

1. IFM Uplift Allocation Amounts (no changes, just regrouped):

CAISOTotalIFMUpliftAllocationAmount**mdhcif**  =

Sum (Q) {BAATotalIFMUpliftAllocationAmount**Q’mdhcif** }Where Balancing\_Authority\_Area (Q’) = “CISO”

EDAMBAATotalIFMUpliftAllocationAmount**Q’mdhcif**  =

BAATotalIFMUpliftAllocationAmount**Q’mdhcif**

Where Balancing\_Authority\_Area (Q’) <> “CISO”

BAATotalPreliminaryIFMUpliftAllocationAmount**Q’mdhcif**  =

Max (0, BAATotalNetIFMUpliftAmount **Q’mdhcif** ) \* BAAIFMUpliftRatio **Q’md**

BAAIFMUpliftRatio **Q’md** =

{If BAATotalIFMPositiveUplift **Q’md** = 0

Then

0

Else

(BAATotalIFMBCRUpliftAmount **Q’md** / BAATotalIFMPositiveUplift **Q’md**)

 End If}

BAATotalIFMPositiveUplift **Q’md** =

Sum over (h, c, i, f) {Max (0, BAATotalNetIFMUpliftAmount **Q’mdhcif** )}

BAATotalIFMBCRUpliftAmount **Q’md** =

#### Sum over (B, r, u, T’, I’, M’, F’) {(-1) \* (TradingDayIFMBCRUpliftAmount BrQ’uT’I’M’F’**md**+

#### TradingDayIFMBCRMSSNetUpliftAmount BQ’T’I’M’**md** )}

 BAATotalNetIFMUpliftAmount **Q’mdhcif** =

 Max (0, BAATotalIFMShortfallAmount  **Q’mdhcif** + BAATotalIFMSurplusAmount **Q’mdhcif** )

BAATotalNonMSSNetIFMShortfallAmount **Q’mdhcif**

Sum over (B, r, u, T’, I’, M’, F’) {IFMNetAmount BrQ’uT’I’M’F’mdhcif \* TradingDayIFMBCRUpliftFlag **BrQ’uT’I’M’F’md** }

TradingDayIFMBCRUpliftFlagBrQ’uT’I’M’F’md

#### {IfTradingDayIFMBCRUpliftAmountBrQ’uT’I’M’F’**md**< 0

Then

1

Else

0 }

TradingDayMSSNetIFMBCRUpliftFlag**BQ’T’I’M’md**

#### {IfTradingDayIFMBCRMSSNetUpliftAmountBQ’T’I’M’**md**< 0

Then

1

Else

0 }

BAATotalMSSNetIFMShortfallAmount **Q’mdhcif**

Sum over (B, T’, I’, M’) {IFMMSSNetBCRAmount BQ’T’I’M’mdhcif \* TradingDayMSSNetIFMBCRUpliftFlag **BQ’T’I’M’md** }

BAATotalIFMShortfallAmount **Q’mdhcif** =

#### Max (0, BAATotalNonMSSNetIFMShortfallAmount **Q’mdhcif** + BAATotalMSSNetIFMShortfallAmount **Q’mdhcif**)

BAATotalIFMSurplusAmount **Q’mdhcif** =

#### Min (0, BAATotalNonMSSNetIFMShortfallAmount **Q’mdhcif** + BAATotalMSSNetIFMShortfallAmount **Q’mdhcif**)

1. RUC and RTM Net Amounts Sequential Netting, Preliminary Amounts prior to any BCR adjustments:

BAATotalPreliminaryRTMUpliftAllocationAmount Q’mdhcif =

Max (0, BAATotalNetRTMUpliftAmount Q’mdhcif) \* BAARUCandRTMUpliftRatio Q’md

BAATotalPreliminaryRUCUpliftAllocationAmount Q’mdhcif  =

Max (0, BAATotalNetRUCUpliftAmount Q’mdhcif) \* BAARUCandRTMUpliftRatio Q’md

BAARUCandRTMUpliftRatio Q’md

{If BAATotalRUCandRTMPositiveUplift Q’md = 0

Then

0

Else

(BAATotalRUCandRTMBCRUpliftAmount Q’md / BAATotalRUCandRTMPositiveUplift Q’md )

 End If}

BAATotalRUCandRTMPositiveUplift Q’md =

Sum (h, c, i, f) {BAASettlementIntervalTotalRUCPositiveUplift Q’mdhcif + BAASettlementIntervalTotalRTMPositiveUplift Q’mdhcif }

BAASettlementIntervalTotalRUCPositiveUplift Q’mdhcif =

Max (0, BAATotalNetRUCUpliftAmount Q’mdhcif)

BAASettlementIntervalTotalRTMPositiveUplift Q’mdhcif =

Max (0, BAATotalNetRTMUpliftAmount Q’mdhcif)

BAATotalRUCandRTMBCRUpliftAmount Q’md =

#### Sum (B, r, u, T’, I’, M’, F’) {(-1) \* (BAATradingDayRUCandRTMBCRUpliftAmount BrQ’uT’I’M’F’md + BAATradingDayMSSNetRUCandRTMBCRUpliftAmount BQ’T’I’M’md )}

BAATotalNetRUCUpliftAmount Q’mdhcif =

 Max (0, BAATotalRUCShortfallAmount Q’mdhcif + BAATotalRTMSurplusAmount Q’mdhcif )

BAATotalNetRTMUpliftAmount Q’mdhcif =

 Max (0, BAATotalRTMShortfallAmount Q’mdhcif + BAATotalRUCSurplusAmount Q’mdhcif)

BAATradingDayRUCandRTMBCRUpliftFlagBrQ’uT’I’M’F’md

#### {IfBAATradingDayRUCandRTMBCRUpliftAmount BrQ’uT’I’M’F’md< 0

Then

1

Else

0

 End If}

BAATradingDayMSSNetRUCandRTMBCRUpliftFlagBQ’T’I’M’md

#### {IfBAATradingDayMSSNetRUCandRTMBCRUpliftAmountBQ’T’I’M’md< 0

Then

1

Else

0

 End If}

BAATotalNonMSSNetRUCShortfallAmount Q’mdhcif *=*

Sum (B, r, u, T’, I’, M’, F’) {BAARUCNetAmount BrQ’uT’I’M’F’mdhcif \* BAATradingDayRUCandRTMBCRUpliftFlag BrQ’uT’I’M’F’md }

BAATotalMSSNetRUCShortfallAmount Q’mdhcif *=*

Sum (B, T’, I’, M’) {BAARUCMSSNetBCRAmount BQ’T’I’M’mdhcif \* BAATradingDayMSSNetRUCandRTMBCRUpliftFlag BQ’T’I’M’md }

BAATotalRUCShortfallAmount Q’mdhcif=

#### Max (0, BAATotalNonMSSNetRUCShortfallAmount Q’mdhcif+ BAATotalMSSNetRUCShortfallAmount Q’mdhcif )

BAATotalRUCSurplusAmount Q’mdhcif=

#### Min (0, BAATotalNonMSSNetRUCShortfallAmount Q’mdhcif+ BAATotalMSSNetRUCShortfallAmount Q’mdhcif )

BAATotalNonMSSNetRTMShortfallAmount Q’mdhcif *=*

Sum (B, r, u, T’, I’, M’, F’) {BAARTMNetAmount BrQ’uT’I’M’F’mdhcif \* BAATradingDayRUCandRTMBCRUpliftFlag BrQ’uT’I’M’F’md }

BAATotalMSSNetRTMShortfallAmount Q’mdhcif *=*

Sum (B, T’, I’, M’) {BAARTMMSSNetBCRAmount BQ’T’I’M’mdhcif \* BAATradingDayMSSNetRUCandRTMBCRUpliftFlag BQ’T’I’M’md }

BAATotalRTMShortfallAmount Q’mdhcif=

#### Max (0, BAATotalNonMSSNetRTMShortfallAmount Q’mdhcif+ BAATotalMSSNetRTMShortfallAmount Q’mdhcif )

BAATotalRTMSurplusAmount Q’mdhcif=

#### Min (0, BAATotalNonMSSNetRTMShortfallAmount Q’mdhcif+ BAATotalMSSNetRTMShortfallAmount Q’mdhcif )

1. BCR Adjustments

BAAHourlyNetIFMBidCostUpliftAmount Q’mdh =

Sum over (c ,i ,f) {BAATotalIFMUpliftAllocationAmount Q’mdhcif }

BAATotalIFMUpliftAllocationAmount Q’mdhcif =

BAATotalPreliminaryIFMUpliftAllocationAmount Q’mdhcif

- BAATransferOutIFMBCRAdjustmentAmount Q’mdhcif + BAATransferInIFMBCRAllocationAmount Q’mdhcif

BAATransferInIFMBCRAllocationAmount Q’mdhcif =

EIMAreaTotalTransferOutIFMBCRAdjustmentAmount mdhcif \* (BAASettlementIntervalTotalNetIFMTransferInQuantity Q’mdhcif/ EIMAreaSettlementIntervalIFMTransferInQuantity mdhcif)

EIMAreaTotalTransferOutIFMBCRAdjustmentAmount mdhcif =

Sum over (Q’) { BAATransferOutIFMBCRAdjustmentAmount Q’mdhcif }

BAATransferOutIFMBCRAdjustmentAmount Q’mdhcif =

BAATotalPreliminaryIFMUpliftAllocationAmount Q’mdhcif \*[ BAASettlementIntervalTotalNetIFMTransferOutQuantity Q’mdhcif/( BAASettlementIntervalTotalNetIFMTransferOutQuantity Q’mdhcif + BAASettlementIntervalTotalIFMLoadScheduleQuantity Q'mdhcif + BAASettlementIntervalTotalDAVirtualDemandAwardQuantity Q'mdhcif + BAASettlementIntervalTotalIFMExportScheduleQuantity Q'mdhcif)]

BAASettlementIntervalTotalIFMLoadScheduleQuantity Q'mdhcif =

BAASettlementIntervalDayAheadEnergyLoadQuantity **Q’mdhcif** + BAAHourlyTotalIRUScheduleLoadQuantity **Q’mdhcif** + BAAHourlyTotalIRDScheduleLoadQuantity **Q’mdhcif**

BAASettlementIntervalDayAheadEnergyLoadQuantity **Q’mdhcif**  =

Sum over (B, r, t, u, T’, I’, M’, F’, S’) { HourlyResourceDayAheadEnergy **BrtuT’I’Q’M’F’S’mdh** }

Where Resource\_Type (t) =’LOAD’

BAAHourlyTotalIRUScheduleLoadQuantity **Q’mdhcif**  =

Sum over (B, r, t) { BAHourlyResIRUScheduleQuantity **BrtQ’mdh** }

Where Resource\_Type (t) =’LOAD’

BAAHourlyTotalIRDScheduleLoadQuantity **Q’mdhcif**  =

Sum over (B, r, t) { BAHourlyResIRDScheduleQuantity **BrtQ’mdh** }

Where Resource\_Type (t) =’LOAD’

BAASettlementIntervalTotalIFMExportScheduleQuantity Q'mdhcif =

BAASettlementIntervalDayAheadEnergyExportQuantity **Q’mdhcif** + BAAHourlyTotalIRUScheduleExportQuantity **Q’mdhcif** + BAAHourlyTotalIRDScheduleExportQuantity **Q’mdhcif**

BAASettlementIntervalDayAheadEnergyExportQuantity **Q’mdhcif**  =

Sum over (B, r, t, u, T’, I’, M’, F’, S’) { HourlyResourceDayAheadEnergy **BrtuT’I’Q’M’F’S’mdh** }

Where t =’ETIE’

BAAHourlyTotalIRUScheduleExportQuantity **Q’mdhcif**  =

Sum over (B, r, t) { BAHourlyResIRUScheduleQuantity **BrtQ’mdh** }

Where t =’ETIE’

BAAHourlyTotalIRDScheduleExportQuantity **Q’mdhcif**  =

Sum over (B, r, t) { BAHourlyResIRDScheduleQuantity **BrtQ’mdh** }

Where t =’ETIE’

BAASettlementIntervalTotalDAVirtualDemandAwardQuantity Q'mdhcif =

Sum over (c, i, f) { BAATotalHourlyDAVirtualDemandAwardQuantity Q'mdh }

EIMAreaSettlementIntervalIFMTransferInQuantity mdhcif =

Sum over (Q’) { BAASettlementIntervalTotalNetIFMTransferInQuantity Q’mdhcif}

BAASettlementIntervalTotalNetIFMTransferInQuantity Q’mdhcif =

(-1)\*Min(0, BAASettlementIntervalTotalNetIFMQuantity Q’mdhcif)

BAASettlementIntervalTotalNetIFMTransferOutQuantity Q’mdhcif =

Max(0, BAASettlementIntervalTotalNetIFMQuantity Q’mdhcif)

BAASettlementIntervalTotalNetIFMQuantity Q’mdhcif =

BAASettlementIntervalTotalDAEnergyTransferImportQuantity Q’mdhcif

* BAASettlementIntervalTotalDAEnergyTransferExportQuantity Q’mdhcif

+ BAASettlementIntervalTotalIRUTransferImportQuantity Q’mdhcif

* BAASettlementIntervalTotalIRUTransferImportQuantity Q’mdhcif

+ BAASettlementIntervalTotalIRDTransferExportQuantity Q’mdhcif

* BAASettlementIntervalTotalIRDTransferImportQuantity Q’mdhcif

BAASettlementIntervalTotalDAEnergyTransferImportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceToDAEnergyQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

BAASettlementIntervalTotalDAEnergyTransferExportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceFromDAEnergyQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

BAASettlementIntervalTotalIRUTransferImportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceToImbalanceReserveUpQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

BAASettlementIntervalTotalIRUTransferExportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceFromImbalanceReserveUpQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

BAASettlementIntervalTotalIRDTransferImportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceToImbalanceReserveDownQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

BAASettlementIntervalTotalIRDTransferExportQuantity Q’mdhcif =

Sum (B, r, A, A’, Q, p, N, z’) { BAATransferSystemResourceFromImbalanceReserveDownQty BrQ’AA’QpNz’mdh }

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

1. RUC BCR Adjustments

BAAHourlyNetRUCBidCostUpliftAmount Q’mdh =

Sum over (c ,i ,f) {BAATotalRUCUpliftAllocationAmount Q’mdhcif }

BAATotalRUCUpliftAllocationAmount Q’mdhcif =

BAATotalPreliminaryRUCUpliftAllocationAmount Q’mdhcif

- BAATransferOutRUCBCRAdjustmentAmount Q’mdhcif + BAATransferInRUCBCRAllocationAmount Q’mdhcif

BAATransferInRUCBCRAllocationAmount Q’mdhcif =

EIMAreaTotalTransferOutRUCBCRAdjustmentAmount mdhcif \* (BAASettlementIntervalTotalNetRUCTransferInQuantity Q’mdhcif/ EIMAreaSettlementIntervalRUCTransferInQuantity mdhcif)

EIMAreaTotalTransferOutRUCBCRAdjustmentAmount mdhcif =

Sum over (Q’) { BAATransferOutRUCBCRAdjustmentAmount Q’mdhcif }

BAATransferOutRUCBCRAdjustmentAmount Q’mdhcif =

BAATotalPreliminaryRUCUpliftAllocationAmount Q’mdhcif \*[ BAASettlementIntervalTotalNetRUCTransferOutQuantity Q’mdhcif/( BAASettlementIntervalTotalNetRUCTransferOutQuantity Q’mdhcif + BAASettlementIntervalEIMAreaMeasuredDemandQuantity Q’mdhcif )]

EIMAreaSettlementIntervalRUCTransferInQuantity mdhcif =

Sum over (Q’) { BAASettlementIntervalTotalNetRUCTransferInQuantity Q’mdhcif}

BAASettlementIntervalTotalNetRUCTransferInQuantity Q’mdhcif =

(-1)\*Min(0, BAASettlementIntervalTotalNetRUCQuantity Q’mdhcif)

BAASettlementIntervalTotalNetRUCTransferOutQuantity Q’mdhcif =

Max(0, BAASettlementIntervalTotalNetRUCQuantity Q’mdhcif)

BAASettlementIntervalTotalNetRUCQuantity Q’mdhcif =

Sum over (B, r, t, F’, S’) {BAHourlyResRCUAwardedQuantity BrtQ’F’S’mdh - BAHourlyResRCDAwardedQuantity BrtQ’F’S’mdh}

 Note: Automatic frequency conversion from hourly to settlement interval will take place.

1. RTM BCR Adjustments:

BAATotalRTMUpliftAllocationAmount Q’mdhcif =

BAATotalPreliminaryRTMUpliftAllocationAmount Q’mdhcif

- BAATransferOutBCRAmount Q’mdhcif + BAATransferInBCRAmount Q’mdhcif

BAATransferOutBCRAmount Q’mdhcif =

BAAEIMTransferOutPercentage Q’mdhcif \* BAATotalPreliminaryRTMUpliftAllocationAmount Q’mdhcif

EIMAreaTotalTransferOutBCRAmount mdhcif =

Sum (Q’) {BAATransferOutBCRAmount Q’mdhcif }

BAATransferInBCRAmount Q’mdhcif =

BAAEIMTransferInPercentage Q’mdhcif \* EIMAreaTotalTransferOutBCRAmount mdhcif

1. RUC and RTM Uplift Allocation Amounts, including any adjustments for RUC and RTM:

CAISOTotalRUCUpliftAllocationAmount mdhcif =

Sum over (Q’) {BAATotalRUCUpliftAllocationAmount Q’mdhcif }

 Where Q’ = ‘CISO’

CAISOTotalRTMUpliftAllocationAmount mdhcif =

Sum over (Q’) {BAATotalRTMUpliftAllocationAmount Q’mdhcif }

 Where Q’ = ‘CISO’

## Outputs

| Output Req ID | Name | Description |
| --- | --- | --- |
| 0 | In addition to any outputs listed below, all inputs shall be included as outputs. | All inputs.  |
|  | CAISOTotalIFMUpliftAllocationAmount**mdhcif** | The Total IFM Uplift amount to be allocated in CC 6636 and/or CC 6637 Applies only to CISO BAA. |
|  | EDAMBAATotalIFMUpliftAllocationAmount**Q’mdhcif** | The Total IFM Uplift amount to be allocated or assigned to each EDAM Entity SC in CC 6637.  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | BAATotalPreliminaryIFMUpliftAllocationAmount**Q’mdhcif** | The Total IFM Uplift amount to be allocated in CC 6636 and/or CC 6637  |
|  | BAAIFMUpliftRatio **Q’md** | Ratio representing total IFM BCR uplift paid (summation of shortfalls and surpluses) to the total surpluses (after sequential netting) |
|  | BAATotalIFMPositiveUplift **Q’md** | IFM Total surpluses after netting with IFM shortfalls |
|  | BAATotalIFMBCRUpliftAmount **Q’md** | Total IFM BCR uplift paid (summation of shortfalls and surpluses) |
|  | BAATotalNetIFMUpliftAmount **Q’mdhcif** | Net amount of IFM costs and revenues (can be positive or negative)  |
|  | BAATotalNonMSSNetIFMShortfallAmount **Q’mdhcif** | IFM Shortfall amount at the BAA level total of all resources, excludes MSS Net entities. |
|  | TradingDayIFMBCRUpliftFlag **BrQ’uT’I’M’F’md** | Identifies whether resource is net shortfall for the day with respect to IFM bid cost recovery. |
|  | TradingDayMSSNetIFMBCRUpliftFlag **BQ’T’I’M’md** | Identifies whether MSS entity with net settlement election is net shortfall for the day with respect to IFM bid cost recovery. |
|  | BAATotalMSSNetIFMShortfallAmount **Q’mdhcif** | Intermediate variable on MSS Net resources for calculation of BAA level IFM shortfall amount. |
|  |  |  |
|  | BAATotalIFMShortfallAmount **Q’mdhcif** | Summation of IFM Net Amounts of all resources with a BCR Payment indicating that total IFM costs exceeds total IFM revenue. |
|  | BAATotalIFMSurplusAmount **Q’mdhcif** | Summation of IFM Net Amounts of all resources with a BCR Payment indicating that total IFM revenue exceeds total IFM costs. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | BAATotalPreliminaryRTMUpliftAllocationAmount Q’mdhcif | Intermediate calculation for a BAA Total RTM Uplift amount |
|  | BAATotalPreliminaryRUCUpliftAllocationAmount Q’mdhcif | Intermediate calculation for a BAA Total RUC Uplift amount |
|  | BAARUCandRTMUpliftRatio Q’md | Ratio representing total RUC/RTM BCR uplift paid (summation of shortfalls and surpluses) to the total surpluses (after sequential netting), per BAA. |
|  | BAATotalRUCandRTMPositiveUplift Q’md | Total RUC/RTM positive uplift over the Trading Day. |
|  | BAASettlementIntervalTotalRUCPositiveUplift Q’mdhcif | Total RUC positive uplift for a Settlement Interval. |
|  | BAASettlementIntervalTotalRTMPositiveUplift Q’mdhcif | Total RTM positive uplift for a Settlement Interval. |
|  | BAATotalRUCandRTMBCRUpliftAmount Q’md | Total RUC/RTM BCR uplift paid (summation of shortfalls and surpluses)  |
|  | BAATotalNetRUCUpliftAmount Q’mdhcif | Net amount of RUC costs and revenues after netting with RTM surpluses  |
|  | BAATotalNetRTMUpliftAmount Q’mdhcif | Net amount of RTM costs and revenues after netting with RUC surpluses  |
|  | BAATradingDayRUCandRTMBCRUpliftFlag BrQ’uT’I’M’F’md | Identifies whether resource is net shortfall for the day with respect to RUC and RTM bid cost recovery. |
|  | BAATradingDayMSSNetRUCandRTMBCRUpliftFlag BQ’T’I’M’md | Identifies whether MSS entity with net settlement election is net shortfall for the day with respect to RUC and RTM bid cost recovery. |
|  | BAATotalNonMSSNetRUCShortfallAmount Q’mdhcif | Intermediate variable on non-MSS Net resources for calculation of marketwide RUC shortfall amount. Applies only to Q’ = ‘CISO’ |
|  | BAATotalMSSNetRUCShortfallAmount Q’mdhcif | Intermediate variable on MSS Net resources for calculation of EIM Area RUC shortfall amount. Applies only to Q’ = ‘CISO’ |
|  | BAATotalRUCShortfallAmount Q’mdhcif | Summation of RUC Net Amounts of all resources with a BCR Payment indicating that total RUC costs exceeds total RUC revenue. Applies only to Q’ = ‘CISO’ |
|  | BAATotalRUCSurplusAmount Q’mdhcif | Summation of RUC Net Amounts of all resources with a BCR Payment indicating that total RUC revenue exceeds total RUC costs. Applies only to Q’ = ‘CISO’ |
|  | BAATotalNonMSSNetRTMShortfallAmount Q’mdhcif | Intermediate variable on non-MSS Net resources for calculation of RTM shortfall amount, per BAA. |
|  | BAATotalMSSNetRTMShortfallAmount Q’mdhcif | Intermediate variable on MSS Net resources for calculation of RTM shortfall amount, per BAA. |
|  | BAATotalRTMShortfallAmount Q’mdhcif | Summation of RTM Net Amounts of all resources with a BCR Payment indicating that total RTM costs exceeds total RTM revenue, per BAA. |
|  | BAATotalRTMSurplusAmount Q’mdhcif | Summation of RTM Net Amounts of all resources with a BCR Payment indicating that total RTM revenue exceeds total RTM costs, per BAA. |
|  | BAAHourlyNetIFMBidCostUpliftAmount Q’mdh | BAA Hourly value of IFM BCR Uplift amount to be allocated |
|  | BAATotalIFMUpliftAllocationAmount Q’mdhcif | BAA Settlement interval value of IFM BCR Uplift amount to be allocated |
|  | BAATransferInIFMBCRAllocationAmount Q’mdhcif | BAA BCR cost allocation amount for IFM energy net Transfer Into the BAA. |
|  | EIMAreaTotalTransferOutIFMBCRAdjustmentAmount mdhcif | Total adjustment amount for IFM energy net Transfer Out of each BAA, and summed across the EIM Area |
|  | BAATransferOutIFMBCRAdjustmentAmount Q’mdhcif | Adjustment amount Area for IFM energy net Transfer Out of each BAA. |
|  | BAASettlementIntervalTotalIFMLoadScheduleQuantity Q'mdhcif | Settlement interval BAA level total of IFM Load Schedule |
|  | BAASettlementIntervalDayAheadEnergyLoadQuantity Q’mdhcif | Settlement interval BAA level total of IFM Load Schedule quantity from DA Energy |
|  | BAAHourlyTotalIRUScheduleLoadQuantity **Q’mdhcif** | Settlement interval BAA level total of IFM Load Schedule quantity from Imbalance Reserve Up |
|  | BAAHourlyTotalIRDScheduleLoadQuantity **Q’mdhcif** | Settlement interval BAA level total of IFM Load Schedule quantity from Imbalance Reserve Down |
|  | BAASettlementIntervalTotalIFMExportScheduleQuantity **Q'mdhcif** | Settlement interval BAA level total of IFM Export Schedule |
|  | BAASettlementIntervalDayAheadEnergyExportQuantity **Q’mdhcif** | Settlement interval BAA level total of IFM Export Schedule quantity from DA Energy |
|  | BAAHourlyTotalIRUScheduleExportQuantity **Q’mdhcif** | Settlement interval BAA level total of IFM Export Schedule quantity from Imbalance Reserve Up |
|  | BAAHourlyTotalIRDScheduleExportQuantity **Q’mdhcif** | Settlement interval BAA level total of IFM Export Schedule quantity from Imbalance Reserve Down |
|  | BAASettlementIntervalTotalDAVirtualDemandAwardQuantity Q'mdhcif | Settlement Interval total per BAA of DA Virtual Demand quantity |
|  | EIMAreaSettlementIntervalIFMTransferInQuantity mdhcif | IFM energy net Transfer Into of each BAA, summed across the EIM Area. |
|  | BAASettlementIntervalTotalNetIFMTransferInQuantity Q’mdhcif | IFM energy net Transfer Into of each BAA. |
|  | BAASettlementIntervalTotalNetIFMTransferOutQuantity Q’mdhcif | IFM energy net Transfer Out of each BAA. |
|  | BAASettlementIntervalTotalNetIFMQuantity Q’mdhcif | IFM energy net computed as for each BAA. |
|  | BAASettlementIntervalTotalDAEnergyTransferImportQuantity Q’mdhcif | BAA Total of DA Energy transfer import quantity |
|  | BAASettlementIntervalTotalDAEnergyTransferExportQuantity Q’mdhcif | BAA Total of DA Energy transfer export quantity |
|  | BAASettlementIntervalTotalIRUTransferImportQuantity Q’mdhcif | BAA Total of Imbalance Reserve Up transfer import quantity |
|  | BAASettlementIntervalTotalIRUTransferExportQuantity Q’mdhcif | BAA Total of Imbalance Reserve Up transfer export quantity |
|  | BAASettlementIntervalTotalIRDTransferImportQuantity Q’mdhcif | BAA Total of Imbalance Reserve Down transfer import quantity |
|  | BAASettlementIntervalTotalIRDTransferExportQuantity Q’mdhcif | BAA Total of Imbalance Reserve Down transfer export quantity |
|  | BAAHourlyNetRUCBidCostUpliftAmount Q’mdh | BAA Hourly value of RUC BCR Uplift amount to be allocated |
|  | BAATotalRUCUpliftAllocationAmount Q’mdhcif | BAA Settlement interval value of RUC BCR Uplift amount to be allocated |
|  | BAATransferInRUCBCRAllocationAmount Q’mdhcif | BAA BCR cost allocation amount for RUC (reliability capacity) net Transfer Into the BAA. |
|  | EIMAreaTotalTransferOutRUCBCRAdjustmentAmount mdhcif | Total adjustment amount for RUC (reliability capacity) net Transfer Out of each BAA, and summed across the EIM Area |
|  | BAATransferOutRUCBCRAdjustmentAmount Q’mdhcif | Adjustment amount Area for RUC (reliability capacity) net Transfer Out of each BAA. |
|  | EIMAreaSettlementIntervalRUCTransferInQuantity mdhcif | RUC (reliability capacity) net Transfer Into of each BAA, summed across the EIM Area. |
|  | BAASettlementIntervalTotalNetRUCTransferInQuantity Q’mdhcif | RUC (reliability capacity) net Transfer Into of each BAA. |
|  | BAASettlementIntervalTotalNetRUCTransferOutQuantity Q’mdhcif | RUC (reliability capacity) net Transfer Out of each BAA. |
|  | BAASettlementIntervalTotalNetRUCQuantity Q’mdhcif | RUC (reliability capacity) net, computed as RCU minus RCD for each BAA. |
|  | BAATotalRTMUpliftAllocationAmount Q’mdhcif | The EIM Area Total RTM Uplift amount |
|  | BAATransferOutBCRAmount Q’mdhcif | The BCR uplift amount contribution due to EIM transfer out of a BAA. |
|  | EIMAreaTotalTransferOutBCRAmount mdhcif | The total transfer out BCR amounts for the entire EIM Region. |
|  | BAATransferInBCRAmount Q’mdhcif | The BCR uplift amount allocation due to EIM transfer in (into) a BAA. |
|  | CAISOTotalRUCUpliftAllocationAmount**mdhcif** | The Total RUC Uplift amount to be allocated in CC 6806 and/or CC 6807  |
|  | CAISOTotalRTMUpliftAllocationAmount**mdhcif** | The Total RTM Uplift amount to be allocated in CC 6678  |

# Charge Code Effective Date

| Charge Code/Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| Pre-calc Bid Cost Recovery Sequential Netting | 5.0 | 04/01/09 | 09/30/10 | Documentation Edits Only |
| Pre-calc Bid Cost Recovery Sequential Netting | 5.0a | 10/01/10 | 4/30/14 | Documentation Edits Only |
| Pre-calc Bid Cost Recovery Sequential Netting | 5.1 | 05/01/14 | 9/30/14 | Configuration Impacted |
| Pre-calc Bid Cost Recovery Sequential Netting | 5.2 | 10/01/14 | 4/30/26 | Configuration Impacted |
| Pre-calc Bid Cost Recovery Sequential Netting | 5.3 | 5/01/26 | Open | Configuration Impacted |