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|  | Settlements & Billing |
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|  |  |
| Configuration Guide:  | RUC Reliability Capacity Down Tier 1 Allocation |
|  |  |
|  |  CC 8816 |
|  |  |
|  | Version 5.0 |

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# Purpose of Document

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

# Introduction

## Background

During the Day Ahead Market, if the scheduled Demand is less than the CAISO Forecast of CAISO Demand, Residual Unit Commitment (RUC) Reliability Capacity Down (RCD) is procured to ensure that enough committed capacity is available and on line to meet the forecasted Demand as well as any forecasted shortfalls of minimum Generation requirements.

RUC RCD Bids (above the minimum Load) may only be submitted if an Energy Bid has also been submitted in the IFM. If a resource is under Resource Adequacy (RA) obligation for a specific amount of capacity, the RA capacity must participate in RUC RCD with a RUC Bid Price of $0/MW. If a RUC RCD Bid is not submitted for the RA capacity, then CAISO will insert a $0/MW proxy bid per hour for the full amount of RA capacity. Non-zero RUC RCD Bids may be submitted for the portion of a resource’s capacity that is not RA capacity. Capacity not pre-dispatched as RMR may also submit non-zero RUC RCD Bids.

Resources that have Compliance Recission due to an FMM capacity range that does not support their DA Energy Schedule plus the Reliabiltiy Capacity Down will be charged at a resource specific RCD No-Pay Penalty Price for the undelivered MW quantity.

RUC RCD payments are the product of Awarded RUC RCD capacity and the RUC RCD Price specified for each PNode. Together, RUC RCD settlements and Unavailability No-Pay Settlements are under CC 8800, and RUC RCD Bid Cost Recovery Uplifts under CC 6620 are allocated in two tiers. First, CC 8816 RUC Reliability Capacity Down Tier 1 Allocation is based upon Net Positive Demand Deviation. Next, any remaining costs are allocated pro-rata to metered Demand under CC 8817 RUC Reliability Capacity Down Tier 2 Allocation.

## Description

Charge Code “CC 8816 – RUC Reliability Capacity Down Tier 1 Allocation” will perform the calculations necessary to implement the business rules identified in the Business Rules of the following section here below.

# Charge Code Requirements

## Business Rules

| Bus Req. ID | Business Rule |
| --- | --- |
|  | This Charge Code shall be calculated on a daily basis.  |
|  | For adjustments to the Charge Code that cannot be accomplished by correction of upstream data inputs/recalculation or operator override Pass Through Bill Charge logic will be applied. |
|  | Actual Scheduling Coordinators (SCs) are referenced by Business Associate ID, and CAISO shall settle with Business Associates (BA) through these IDs. |
|  | The formulas herein adopt the convention that payments made by CAISO to BAs will be negative, while payments received by the CAISO from BAs (charges to BAs) will be positive. (In other words, the signs reflect the flow of money from the point of view of the CAISO.) |
|  | Settlements will allocate RUC Reliability Capacity Down (RCD) costs in 2 tiers |
|  | **Tier-1 RCD Cost Allocation**For each individual component, and on hourly basis:* Tier-1 RCD Allocation Cost = Tier-1 RCD Allocation Quantity \* Tier-1 RCD BAA Allocation Price.
 |
|  | **Tier-1 RCD Allocation Quantities (See table below)** |
|  | **Tier-1 RCD BAA Allocation Price**For each BAA, and on hourly basis, this price shall be calculated as follows:* Min (RCD BAA Average Price , RCD BAA Derived Price)
* where
* RCD BAA Average Price = Sum of (RCD Payments - RCD No Pay Amounts) across BAA / [Sum of (RCD Award - RCD No Pay Quantity) across BAA].
* RCD BAA Derived Price = Sum of (RCD Payments - RCD No Pay Amounts) across BAA / Sum of Tier-1 RCD Allocation Quantity across BAA.
 |
|  | Treatment of MSS* If MSS operator has elected to load follow to manage its own load variability, it shall NOT get RCD Tier-1 nor RCD Tier-2 cost allocations based on the MSS operator’s net portfolio uninstructed deviations. This is because MSS Operator that has elected to Load Follow is required to provide sufficient resources in DAM to follow its Load within the MSS Deviation Band.
* Otherwise, for both RCD Tier-1 and RCD Tier 2 cost allocations, MSS resources shall be settled in a similar manner as non-MSS resources, regardless of their Net versus Gross selection.
 |
|  | Treatment of ETC, and TOR* System shall exclude the ETC and TOR self-schedules from RCD Tier-1 and RCD Tier-2 allocations up to the valid and balanced portion of ETC and TOR self-schedules.

In contrast, System shall consider quantities above the valid and balanced portion of the ETC or TOR self-schedules in RCD Tier-1 and RCD Tier-2 cost allocations. |
|  | For each BAA, if the RCD obligation is higher than the RCD awards, all of the RCD cost will be allocated to RCD Tier-1, otherwise, RCD cost will be split between Tier-1 and Tier-2. |
|  | This cost allocation does not apply to WEIM-Only BAAs. WEIM-Only BAAs do not participate in EDAM and will not be cost allocated for Reliability Capacity. |

 **Tier-1 RCD Allocation Quantity:**

|  |  |
| --- | --- |
| **Component Type** | **Tier-1 RCD Allocation Quantity** |
| Virtual Bids | Max(0, SC Net Virtual Demand Awards)Applies only if the BAA has total net virtual demand. |
| Load | ABS (Net Positive Measured Demand) i.e. Over-scheduled LoadExclude:a) Net positive demand associated with balanced ETC/TOR rights, b) Net positive deviation for Participating Load (PL) resulting from a market dispatch |
| MSS (which Load Follow) | The MSS is exempted. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| PC MSS Netting |
| Pre-calc – Bid Cost Recovery Sequential Netting |
| PC ETC TOR CVR Quantity |
| Pre-calc – Measured Demand Over Control Area |
| CC 6011 - Day Ahead Energy, Congestion, Loss Settlement |
| CC 6013 Convergence Bidding DA Energy, Congestion, Loss Settlement |
| CC 8076– Day Ahead Imbalance Reserve Up Tier 1 Allocation |
| CC 8810 –RUC Reliability Capacity Down Settlement |
| CC 8806– RUC Reliability Capacity Up Tier 1 Allocation |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 4989 – Rounding Adjustment Settlement |
| CC 8817– RUC Reliability Capacity Down Tier 2 Allocation |

## Inputs – External Systems

| Row # | Variable Name | Description |
| --- | --- | --- |
|  | WEIMOnlyBAAFlag Q’md | Flag indicating an EIM BAA that participates in the WEIM only, not EDAM. |
|  | PTBAdjBAHourlyRCDTier1AllocAmtBQ’JM’mdh | PTB Adjustment for the Tier 1 RCD cost allocation amount portion |

## Inputs - Predecessor Charge Codes or Pre-calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
|  | BAHourlyResRCDAwardedQuantity BrtQ’F’S’mdh | CC 8810 –RUC Reliability Capacity Down Settlement |
|  | BAHourlyResRCDPaymentAmount BrtQ’F’S’mdh | CC 8810 –RUC Reliability Capacity Down Settlement |
|  | BA15MResRCDNoPayQuantity BrtQ’mdhc |  CC 8810 –RUC Reliability Capacity Down Settlement |
|  | BAHourlyResRCDNoPayAmount BrtQ’mdh | CC 8810 –RUC Reliability Capacity Down Settlement |
|  | BAAHourlyTotalDANetVirtualDemandAwardQuantity Q’mdh | CC 6013 – Convergence Bidding DA Energy\_Cong\_Loss Settlement |
|  | BAHourlyDANetVirtualDemandAwardQuantity BQ’mdh | CC 6013 – Convergence Bidding DA Energy\_Cong\_Loss Settlement |
|  | BAMSSLoadFollowingFlagBM'md | CC 8076– Day Ahead Imbalance Reserve Up Tier 1 Allocation |
|  | BASettlementIntervalResRUCPosUIEQuantityBrtQ’M’F’S’mdhcif | CC 8806– RUC Reliability Capacity Up Tier 1 Allocation |
|  | BAHourlyMSSLF\_RUCTier1AllocQuantityBQ’mdh | CC 8806– RUC Reliability Capacity Up Tier 1 Allocation |

## CAISO Formula

The daily settlement for this charge code for each Business Associate by Trading Day is derived according to the formulation below.

**Note:** The following calculation is listed starting with the final charge calculation and progressively detailing the intermediate calculations and Settlement input.

* + 1. **BAHourlyRCDTier1AllocAmount BQ’mdh =**
		BAHourlyTotalRCDTier1AllocQuantityBQ’mdh\* BAAHourlyRCDTier1AllocPrice Q’mdh
		2. **PTBAdjustmentBAHourlyRCDTier1AllocAmount BQ’mdh =**
		Sum (J, M’) { PTBAdjBAHourlyRCDTier1AllocAmt BQ’JM’mdh }
		3. **BAHourlyRCDTier1FinalAllocAmount BQ’mdh =**
		BAHourlyRCDTier1AllocAmountBQ’mdh + PTBAdjustmentBAHourlyRCDTier1AllocAmountBQ’mdh
		4. **BAATotalHourlyRCDTier1AllocAmount Q’mdh =**
		Sum (B) {BAHourlyRCDTier1FinalAllocAmountBQ’mdh }
		5. **BAAHourlyRCDTier2CostAmount Q’mdh =**
		BAAHourlyRCDPayAmount Q’mdh - BAATotalHourlyRCDTier1AllocAmountQ’mdh

**A. Virtual Awards, Load Resources, and MSS LF Tier 1 RCD Allocation Quantities**

* + 1. **BAHourlyTotalRCDTier1AllocQuantity BQ’mdh =**
		BAHourlyNetVirtualDemandRCDTier1AllocQuantityBQ’mdh + BAHourlyTotalLoadResRCDTier1AllocQuantityBQ’mdh

Excluding records where BAHourlyMSSLF\_RUCTier1AllocQuantityBQ’mdh exist.

* + 1. **BAHourlyNetVirtualDemandRCDTier1AllocQuantity BQ’mdh =**
		If (BAAHourlyTotalDANetVirtualDemandAwardQuantity Q’mdh > 0 )

Then BAHourlyDANetVirtualDemandAwardQuantity BQ’mdh

Else 0

End If

* + 1. **BAHourlyTotalLoadResRCDTier1AllocQuantity BQ’mdh =**
		Sum (r, t, M’) {BAHourlyLoadResRCDTier1AllocQuantity BrtQ’M’mdh }
		2. **BAHourlyLoadResRCDTier1AllocQuantity BrtQ’M’mdh =**

Sum (F’, S’, c, i, f) {Abs(BASettlementIntervalResRUCPosUIEQuantity BrtQ’M’F’S’mdhcif)}

where Resource\_Type (t) = ‘LOAD’ and Entity\_Component\_Type (F’) not in (‘PMPST’, ‘PMPP’)

Excluding records where WEIMOnlyBAAFlag Q’md, and BAMSSLoadFollowingFlagBM'md exist.

**B. Tier 1 Price Calculations**

* + 1. **BAAHourlyRCDTier1AllocPrice** **Q’mdh =**

Min ( BAAHourlyRCDTier1AveragePrice Q’mdh , BAAHourlyRCDTier1DerivedPrice Q’mdh)

* + 1. **BAAHourlyRCDPayAmount** **Q’mdh =**

Sum (B, r, t, F’, S’){ BAHourlyResRCDPaymentAmount BrtQ’F’S’mdh - BAHourlyResRCDNoPayAmount BrtQ’mdh }

* + 1. **BAAHourlyTotalRCDAwardQuantity** **Q’mdh =**

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

* + 1. **BAAHourlyTotalRCDNoPayQuantity** **Q’mdh =**

Sum (B, r, t, c){ BA15MResRCDNoPayQuantity BrtQ’mdhc }

* + 1. **BAAHourlyRCDTier1AveragePrice** **Q’mdh =**

(BAAHourlyRCDPayAmount Q’mdh)*/* BAAHourlyTotalRCDAwardQuantity Q’mdh

* + 1. **BAAHourlyTotalRCDTier1AllocQuantity Q’mdh** =

Sum (B) {BAHourlyTotalRCDTier1AllocQuantity BQ’mdh }

* + 1. **BAAHourlyRCDTier1DerivedPrice** **Q’mdh =**

BAAHourlyRCDPayAmount Q’mdh */* BAAHourlyTotalRCDTier1AllocQuantityQ’mdh

## Outputs

| ID | Name | Description |
| --- | --- | --- |
| -- | In addition to any outputs listed below, all inputs shall be included as outputs.  | All inputs. Refer to section 3.6 and 3.7 above for input descriptions. |
|  | BAHourlyRCDTier1AllocAmount BQ’mdh | Tier 1 allocation of RCD costs |
|  | BAAHourlyTotalRCDNoPayQuantity Q’mdh | Total RCD no pay quantity per BAA |
|  | PTBAdjustmentBAHourlyRCDTier1AllocAmount BQ’mdh | PTB for Tier 1 RCD cost allocation component |
|  | BAHourlyRCDTier1FinalAllocAmount BQ’mdh | Tier 1 RCD cost allocation component including any relevant PTB adjustment |
|  | BAATotalHourlyRCDTier1AllocAmount Q’mdh | Total Tier 1 RCD cost allocation per BAA |
|  | BAAHourlyRCDTier2CostAmount Q’mdh | Total Tier 2 RCD costs to be allocated per BAA |
|  | BAHourlyTotalRCDTier1AllocQuantity BQ’mdh | BA Total Tier 1 RCD allocation quantity. Combines total resource level, and net virtual demand. Excludes MSS that is load following. |
|  | BAHourlyNetVirtualDemandRCDTier1AllocQuantityBQ’mdh | Allocation quantity for a BA with net virtual demand provided the entire BAA is also net virtual demand for the Trading Hour. |
|  | BAHourlyTotalLoadResRCDTier1AllocQuantity BQ’mdh | Tier 1 RCD allocation quantity for all load resources per BA |
|  | BAHourlyLoadResRCDTier1AllocQuantity BrtQ’M’mdh | Tier 1 RCD cost allocation quantity contribution for LOAD resource type |
|  | BAAHourlyRCDTier1AllocPrice Q’mdh | Tier 1 RCD cost allocation price |
|  | BAAHourlyRCDPayAmount Q’mdh | Hourly RCD payments per BAA |
|  | BAAHourlyTotalRCDAwardQuantity Q’mdh | Total RCD schedule quantity per BAA |
|  | BAAHourlyRCDTier1AveragePrice Q’mdh | Tier 1 RCD average price per BAA |

|  |  |  |
| --- | --- | --- |
|  | BAAHourlyTotalRCDTier1AllocQuantity Q’mdh | BAA hourly total RCD Tier 1 allocation quantity |
|  | BAAHourlyRCDTier1DerivedPrice Q’mdh | Tier 1 RCD derived (interim) price per BAA |

# Charge Code Effective Dates

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Charge Code/Pre-calc Name | Document Version  | Effective Start Date | Effective End Date | Version Update Type |
| RUC Reliability Capacity Down Tier 1 Allocation | 5.0 | 05/01/2026 | Open | Configuration Impacted |