Settlements and Billing

 Version 5.39

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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

The RTM Net Amount Pre-calculation is associated with settlement charge groups as follows:

|  |  |  |
| --- | --- | --- |
| Charge Code | Charge Group | Parent Charge Group |
| RTM Net Amt Pre-calculation | Bid Cost Recovery Pre-Calc | Pre-calculation |

## Description

RTM Net Amount Pre-calculation will perform the calculations necessary to implement the business rules identified in the Business Rules section below.

For each Settlement Interval, this pre-calculation will generate the RTM Bid Costs, RTM market revenue, and the RTM Net Amount as the net difference between RTM costs and RTM revenue for various Bid Cost Recovery Eligible Resources (for example, Generating Units, Pumped-Storage Units, Proxy Demand Resources and resource specific System Resources without a Circular Schedule). Contribution from GHG payment, Hold SOC ED payment, and contribution from net FRP payments and charges due to FRP uncertainty awards as well as BCR eligible forecasted movement assessment are then added to this RTM Net Amount. The result is subsequently used as an input for CC 6620 – RUC and RTM Bid Cost Recovery Settlement and pre-calculation Bid Cost Recovery Sequential Netting.

# Charge Code Requirements

## Business Rules

| Bus Req ID | Business Rule |
| --- | --- |
|  | This Pre-calc is a daily computation generating results on a Settlement Interval basis. |
|  | For purposes of determining the Unrecovered Bid Cost Uplift Payments for each Bid Cost Recovery Eligible Resource as determined according to Tariff Section 11.8.5 and the allocation of Unrecovered Bid Cost Uplift Payments for each Settlement Interval, the CAISO shall sequentially calculate the Bid Costs, which can be positive (IFM, RUC or RTM Bid Cost Shortfall) or negative (IFM, RUC or RTM Bid Cost Surplus) in the IFM, RUC and the Real-Time Market, as the algebraic difference between the respective IFM, RUC or RTM Bid Cost and the IFM, RUC or RTM Market Revenues.  |
|  | The RTM Bid Costs shall be calculated pursuant to ISO Tariff Section 11.8.4.1 and the RTM Market Revenues, including the FMM Market Revenues and the RTD Market Revenues, shall be calculated pursuant to ISO Tariff Section 11.8.4.2. |
|  | The RTM Energy Bid Costs include the FMM Energy Bid Costs and RTD Energy Bid Costs.  |
|  | The RTM Market Revenues include the FMM Market Revenues and RTD Market Revenues. |
|  | The Energy subject to RTM Bid Cost Recovery is the Instructed Imbalance Energy, excluding Standard Ramping Energy, Residual Imbalance Energy, Exceptional Dispatch Energy, Derate Energy, Ramping Energy Deviation, Regulation Energy and MSS Load Following Energy, regardless of whether the Energy is from the FMM or RTD, and is subject to the application of the Real-Time Performance Metric and the Persistent Deviation Metric. |
|  | For each Settlement Interval, the CAISO shall calculate RTM Bid Cost for each Bid Cost Recovery Eligible Resource, as the algebraic sum of the RTM Start-Up Cost, RTM Minimum Load Cost, RTM Transition Cost, RTM Pump Shut-Down Cost, RTM Energy Bid Cost, RTM Pumping Cost, RTM AS Bid Cost, and when applicable, the RUC and RTM Minimum Load Costs and the IFM Minimum Load Costs. |
|  | For Multi-Stage Generating Resources the CAISO will determine the applicable Commitment Period (IFM, RUC or RTM) and select the applicable Start-Up Cost, Minimum Load Cost, and Transition Cost in any given Settlement Interval. |
|  | For Multi-Stage Generating Resources, the incremental RTM Start-Up Cost, Minimum Load Cost, and Transition Cost to provide RTM committed Energy or awarded Ancillary Services capacity for an MSG Configuration other than the self-scheduled MSG Configuration are determined by the performance of the RTM. |
|  | For any Settlement Interval, the RTM Energy Bid Cost for the Bid Cost Recovery Eligible Resource except Participating Loads shall be computed as the sum of the products of each FMM and RTD Instructed Imbalance Energy (IIE) portion, except Standard Ramping Energy, Residual Imbalance Energy, FMM and RTD Exceptional Dispatch Energy, FMM and RTD Derate Energy, MSS Load Following Energy, Ramping Energy Deviation and Regulating Energy, with the relevant Energy Bid prices, the Default Energy Bid price, or the applicable FMM or RTD Locational Marginal Price, if any, for each Settlement Interval. |
|  | For Settlement Intervals for which the Bid Cost Recovery Eligible Resource is ramping up to or down from a rerated Minimum Load that was increased in SLIC for the Real-Time Market, the FMM or RTD Energy incurred by the ramping will be classified as FMM or RTD Derate Energy and will not be included in Bid Cost Recovery. |
|  | For any resource that is ramping up to or down from an Exceptional Dispatch instruction the relevent Energy Bid cost used in the RTM Energy Bid Cost will be settled on the same basis as the Energy Bid used in the Settlement of the Exceptional Dispatch that led to the ramping. |
|  | The RTM Energy Bid Cost for a Bid Cost Recovery Eligible Resource, including Participating Loads and Proxy Demand Response Resources, for a Settlement Interval is subject to the Real-Time Performance Metric and the Persistent Deviation Metric. |
|  | Any Uninstructed Imbalance Energy is not eligible for Bid Cost Recovery. |
|  | For a Multi-Stage Generating Resource the CAISO will determine the RTM Energy Bid Cost based on the Generating Unit or Dynamic Resource-Specific System Resource level. |
|  | Any energy storage resource shall not be eligible for RTM Bid Cost Shortfall in both the hour ending and hour before a submitted End of Hour State of Charge Parameter. |
|  | For each Settlement Interval, the Real-Time Market AS Bid Cost shall be the product of the average Real-Time Market AS Award from each accepted AS Bid submitted in the Settlement Interval for the Real-Time Market, reduced by any relevant tier-1 No Pay capacity in that Settlement Interval (but not below zero), with the relevant AS Bid price. |
|  | The average Real-Time Market AS Award for a given AS in a Settlement Interval is the sum of the 15-minute Real-Time Market AS Awards in that Settlement Interval, each divided by the number of 15-minute Commitment Intervals in a Trading Hour and prorated to the duration of the Settlement Interval (10/15 if the Real-Time Market AS Award spans the entire Settlement Interval, or 5/15 if the Real-Time Market AS Award spans half the Settlement Interval). |
|  | For a Multi-Stage Generating Resource the CAISO will determine the RTM AS Bid Cost based on the Generating Unit or Dynamic Resource-Specific System Resource level. |
|  | The Real-Time Market AS Bid Cost shall also include Mileage Bid Costs. |
|  | For each Settlement Interval, the Real-Time Mileage Bid Cost shall be the product of Instructed Mileage associated with a Real-Time Regulation capacity award, as adjusted for accuracy, and the relevant Mileage Bid price divided by the number of Settlement Intervals for the Real-Time Market in a Trading Hour. |
|  | The CAISO will determine and calculate the Real Time Market Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level. |
|  | The RTM Market Revenue Calculations are subject to the Real-Time Performance Metric and the Persistent Deviation Metric. |
|  | For each Settlement Interval in a CAISO Real-Time Market Commitment Period, the RTM Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of the elements listed below: |
|  | 1. The sum of the products of the FMM or RTD Instructed Imbalance Energy (including Energy from Minimum Load of the Bid Cost Recovery Elegible Resource committed in RUC and where for Pumped-Storage Hydro Units and Participating Load operating in the pumping mode or serving Load, the MWh is negative), except Standard Ramping Energy, Residual Imbalance Energy, FMM and RTD Exceptional Dispatch Energy, FMM and RTD Derate Energy, MSS Load Following Energy, Ramping Energy Deviation and Regulation Energy, with the relevant FMM and RTD LMP, for each Settlement Interval.
 |
|  | 1. The product of the Real-Time Market AS Award from each accepted Real-Time Market AS Bid in the Settlement Interval with the relevant ASMP, divided by the number of fifteen (15)-minute Commitment Intervals in a Trading Hour (4), and prorated to the duration of the Settlement Interval.
 |
|  | 1. The relevant tier-1 No Pay charges for that Bid Cost Recovery Eligible Resource in that Settlement Interval.
 |
|  | 1. The Forecasted Movement and Uncertainty Awards Settlement Amounts are included in the RTM Market Revenues calculation, not including:
	1. the amounts rescinded;
	2. Forecasted Movement revenue when there are changes in Self-Schedules across consecutive Trading Hours; and
	3. Forecasted Movement revenue when there are changes in EIM Base Schedules across consecutive Trading Hours without Economic Bids.
 |
|  | For Multi-Stage Generating Resources the RTM Market Revenue calculations will be made at the Generating Unit level. |
|  | For each Settlement Interval in a non-CAISO Real-Time Market Commitment Period, the Real-Time Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of the following: |
|  | 1. The sum of the products of the FMM or RTD Instructed Imbalance Energy (excluding the Energy from Minimum Load of Bid Cost Recovery Eligible Resources committed in RUC), except Standard Ramping Energy, Residual Imbalance Energy, FMM and RTD Exceptional Dispatch Energy, Derate Energy, MSS Load Following Energy, Ramping Energy Deviation and Regulating Energy, with the relevant FMM or RTD LMP, for each Settlement Interval;
 |
|  | 1. The product of the Real-Time Market AS Award from each accepted Real-Time Market AS Bid in the Settlement Interval with the relevant ASMP, divided by the number of fifteen (15)-minute Commitment Intervals in a Trading Hour (4), and prorated to the duration of the Settlement Interval.
 |
|  | 1. The relevant tier-1 No Pay charges for that Bid Cost Recovery Eligible Resource in that Settlement Interval.
 |
|  | The Energy subject to RTM Bid Cost Recovery for Metered Subsystems also excludes Energy from Minimum Load , if the resource is not committed by the CAISO in the Real-Time, in addition to Standard Ramping Energy, Residual Imbalance Energy, FMM and RTD Exceptional Dispatch Energy, FMM and RTD Derate Energy, Ramping Energy Deviation, Regulation Energy and MSS Load Following Energy. |
|  | The RTM Bid Cost Recovery for MSS Operators differs based on whether the MSS Operator has elected gross or net Settlement; except that the calculation of the RTM Bid Costs and RTM Market Revenues for Ancillary Services will be as provided for a non-MSS entity and does not vary on the basis of the MSS’s election of gross or net Settlement. |
|  | For an MSS Operator that has elected gross Settlement, regardless of other MSS optional elections (Load following or RUC opt-in or out), the RTM Bid Cost and RTM Market Revenue of the Real-Time delivered Instructed Imbalance Energy subject to Bid Cost Recovery is determined for each resource in the same way these amounts are determined for the non-MSS resource. |
|  | The Energy subject to RTM Bid Cost Recovery is the Instructed Imbalance Energy, excluding Standard Ramping Energy, Residual Imbalance Energy, FMM and RTD Exceptional Dispatch Energy, FMM and RTD Derate Energy, Ramping Energy Deviation, Regulation Energy and MSS Load Following Energy, and is subject to the application of the Real-Time Performance Metric and the Persistent Deviation Metric. |
|  | The RTM Bid Cost Shortfall or Surplus for Energy and Ancillary Services in total is determined for each Trading Hour of the RTM over the Trading Day by taking the algebraic difference between the RTM Bid Cost and RTM Market Revenue. |
|  | For an MSS Operator that has elected net Settlement, regardless of other MSS optional elections (Load following or RUC opt-in or out), the RUC Bid Costs and RUC Market Revenue are combined with RTM Bid Cost and RTM Market Revenue on an MSS level. |
|  | For MSS entities that have elected net Settlement regardless of other MSS optional elections (i.e., Load following or not, or RUC opt-in or out), unlike non-MSS resources, the RUC and RTM Bid Cost Shortfall or Surplus is treated at the MSS level and not at the resource specific level, and is calculated as the RUC and RTM Bid Cost Shortfall or Surplus of all BCR Eligible Resources within the MSS. |
|  | In calculating the Energy RTM Market Revenue for all the resources within the MSS (as calculated for non-MSS resources), the CAISO will use the applicable FMM or RTD Settlement Interval MSS Price. |
|  | The RUC and RTM Bid Cost Shortfall and Surplus for Energy, RUC Availability and Ancillary Services are first calculated separately for the MSS for each Settlement Interval of the Trading Day, with qualified Start-Up Cost, qualified Minimum Load Cost and qualified Multi-Stage Generator transition cost included into the RUC and RTM Bid Cost Shortfalls and Surpluses of Energy calculation. |
|  | The MSS’s overall RUC and RTM Bid Cost Shortfall or Surplus is then calculated as the algebraic sum of the RUC and RTM Bid Cost Shortfall or Surplus for Energy, the RUC Bid Cost Shortfall or Surplus for RUC Availability, and the RTM Bid Cost Shortfall or Surplus for AS for each Settlement Interval. |
|  | The CAISO will adjust the RTM Energy Bid Cost, the RUC and RTM Minimum Load Costs and the RTM Market Revenues calculations by multiplying the Real-Time Performance Metric with those amounts for the applicable Settlement Interval. |
|  | The CAISO will apply the Real-time Performance Metric to the RTM Pumping Bid Costs in the same manner in which the CAISO applies the Real-time Performance Metric to the RTM Energy Bid Costs. |
|  | In all cases, regardless of the rules specified herein, the application of the Real-Time Performance Metric shall never increase a BCR Eligible Resource’s Unrecovered Bid Cost Uplift payments. |
|  | If the RTM Energy Bid Cost plus the RUC and RTM Minimum Load Costs, and the RTM Market Revenues are greater than or equal to zero (0), the CAISO will apply the Real-Time Performance Metric to RTM Energy Bid Costs, RUC and RTM Minimum Load Costs, and not the RTM Market Revenues. |
|  | If the RTM Energy Bid Costs plus the RUC and RTM Minimum Load Costs are greater than or equal to zero (0) and the RTM Market Revenues are negative, the CAISO will apply the Real-Time Performance Metric to the RTM Energy Bid Costs, RUC and RTM Minimum Load Costs, and the RTM Market Revenues. |
|  | If the RTM Energy Bid Costs plus the RUC and RTM Minimum Load Costs are negative, and the RTM Market Revenues are greater than or equal to zero (0) , the CAISO will not apply Real-Time Performance Metric to the RTM Energy Bid Costs, RUC or RTM Minimum Load Costs or the RTM Market Revenues. |
|  | If the RTM Energy Bid Costs plus the RUC and RTM Minimum Load Costs, and the RTM Market Revenues are negative, the CAISO will apply the Real-Time Performance Metric to the RTM Market Revenues but not the RTM Energy Bid Costs or the RUC or RTM Minimum Load Costs. |
|  | If for a given Settlement Interval the absolute value of the resource’s Metered Energy, less Regulation Energy and less Expected Energy, is less than or equal to the Performance Metric Tolerance Band, then the CAISO will not apply the Real-Time Performance Metric to the calculation of the RTM Energy Bid Cost, RTM Minimum Load Cost, or RTM Market Revenue. |
|  | The CAISO shall modify Bid Cost Recovery calculations and Residual Imbalance Energy payments to address persistent deviations that expand Bid Cost Recovery payments beyond what is necessary for purposes of ensuring Bid Cost Recovery as described below. |
|  | The ISO will apply the following rules to evaluate the resource’s performance relative to the Persistent Deviation Metric Threshold and will apply any attendant bid cost basis modification specified with each rule. |
|  | Rule 1 -If six (6) or fewer Settlement Intervals out of the previous twenty four (24) Settlement Intervals of the rolling two-Trading Hour persistent deviation evaluation window are flagged as exceeding the Persistent Deviation Metric Threshold, then: (a) the RTM Energy Bid Costs shall be based on the applicable Energy Bid price, as mitigated, and (b) Residual Imbalance Energy shall be settled based on the reference hour Energy Bid.  |
|  | Rule 2 -If seven (7) or more Settlement Intervals of the previous twenty four (24) Settlement Intervals of the rolling two-Trading Hour persistent deviation evaluation window are flagged as exceeding the Persistent Deviation Metric Threshold, then for all the previous twenty four (24) Settlement Intervals in the two-hour window: (a) the RTM Energy Bid Costs (i) for Optimal Energy above the Day-Ahead Scheduled Energy will be based on the lesser of the applicable Default Energy Bid price, the applicable Energy Bid price, as mitigated, or the applicable FMM or RTD Locational Marginal Price, and (ii) for Optimal Energy below the Day-Ahead Scheduled Energy the greater of the applicable Default Energy Bid price, the applicable Energy Bid price, as mitigated, or the applicable FMM or RTD Locational Marginal Price; and(b) the Residual Imbalance Energy Bid Cost(i) for Residual Imbalance Energy above the Day-Ahead Scheduled Energy will be based on the lesser of the applicable Default Energy Bid price, the relevant Energy Bid Price, as mitigated, or the applicable RTD Locational Marginal Price, and (ii) for Residual Imbalance Energy below the Day-Ahead Schedule Energy will be based on the greater of the applicable Default Energy Bid price, the relevant Energy Bid Price, or the applicable RTD Locational Marginal Price. |
|  | Rule 3 -Once a Settlement Interval is flagged as exceeding the Persistent Deviation Metric Threshold, it remains flagged when it is considered in the subsequent rolling two-Trading Hour evaluation window and its bid basis qualification for that Settlement Interval will not change. |
|  | Rule 4 -If a Settlement Interval’s bid basis is determined by the Rule 1 above in a previous evaluation, it can be re-determined pursuant to the additional rules in a subsequent rolling two-Trading Hour evaluation window based on the Persistent Deviation Metric Threshold. |
|  | Instructed Mileage associated with a Real-Time Market Regulation Up or Regulation Down award will be paid the associated Real-Time Mileage clearing price. |
|  | For both Regulation Up and Regulation Down AS capacity awards, if a resource is awarded incremental Regulation in the Real-Time Market, the Instructed Mileage for the specific Regulation type (Regulation Up or Regulation Down) shall be divided between the Day Ahead Market and Real Time Market, in proportion to the Day-Ahead and Real-Time Regulation Capacity awards for the Regulation type. |
|  | The CAISO will adjust a resource’s Mileage payments based on the accuracy of the resource’s response to CAISO EMS signals. |
|  | To determine this accuracy adjustment, the CAISO will sum a resource’s Automatic Generation Control set points for each four (4) second Regulation interval every fifteen (15) minutes and then sum the total deviations from the Automatic Generation Control set point for each four (4) second regulation interval during that fifteen (15) minute period. *(Fact)* |
|  | The CAISO will divide the sum of the resource’s Automatic Generation Control set points less the sum of the resource’s total deviations by the sum of the resource’s Automatic Generation Control set points. *(Fact)* |
|  | The CAISO will apply the resulting percentage to the resource’s Regulation performance payments as an accuracy adjustment. |
|  | Bid Cost Recovery (BCR) Eligible Resources are those resources eligible to participate in the Bid Cost Recovery as specified in Tariff Section 11.8 (Bid Cost Recovery). They include Generating Units, System Units, System Resources with RTM Economic Bids, Participating Loads, Reliability Demand Response Resources, and Proxy Demand Resources and, for purposes of scheduling and operating the Real-Time Market only, EIM Resources. (Fact) |
|  | A System Resource that has a Schedule that results from Bids submitted in violation of Section Tariff 30.5.5 shall not be a Bid Cost Recovery Eligible Resource for any Settlement Interval that occurs during the time period covered by the Schedule that results from Bids submitted in violation of Section Tariff 30.5.5. |
|  | Accepted Self-Schedule Hourly Blocks, cleared Economic Hourly Block Bids, and cleared Economic Hourly Block Bids with Intra-Hour Option are not eligible to participate in Bid Cost Recovery in the Real-Time Market. |
| 15.2.1 | Energy Storage Resources with accepted RTM Self-Schedules are not eligible to receive Bid Cost Shortfall for the hour prior and hour ending of the submitted RTM self schedule. |
|  | Scheduling Coordinators for Non-Generator Resources are not eligible to recover Start-Up Costs, Minimum Load Costs, Pumping Costs, Pump Shut-Down Costs, or Transition Costs but are eligible to recover Energy Bid Costs, RUC Availability Payments and Ancillary Service Bid Costs. |
|  | Energy Storage Resources that have a binding Ancillary Service State Of Charge constraint due to an Ancillary Service award are not eligible to receive Bid Cost Shortfall in that interval. |
| 1.
 | Pass Through Bill Charge Adjustment Logic applies to the RTM Net Amount Pre-calculation. |
|  | MSS Load Following Energy is not included in Bid Cost Recovery. |
|  | RTD Optimal Energy that overlaps with MSS Load Following Energy is not eligible for Bid Cost Recovery. |
|  | MSS Load Following Energy does not coexist with FMM Optimal Energy |
|  | Virtual Awards are not eligible for Bid Cost Recovery. |
|  | Balancing Authority Area attribute shall be associated with the net amounts - for resource and MSS level net amounts - to be used in successor charge codes. |
|  | For dispatchable resources (or BCR eligible resources), their Flexible Ramp Product (FRP) assessment due to uncertainty awards, shall be included in the daily RTM bid cost recovery (BCR) calculation. The FRP assessment that goes into BCR shall not include any rescission payments or charges. |
|  | For dispatchable resources (or BCR eligible resources), their Flexible Ramp Product (FRP) assessment due to eligible forecasted movement, shall be included in the daily RTM bid cost recovery (BCR) calculation. The FRP assessment that goes into BCR shall not include any rescission payments or charges. |
|  | Not all forecasted movement for a resources are included into BCR. In particular, the following are the exceptions:1. There are self-schedules at different levels across consecutive trading hours; or
2. There are base schedules at different levels without energy bids across consecutive trading hours.

Under the above conditions, the forecasted movement settlement for the 15minute (FMM) and 5 minute (RTD) from the middle to the middle of these consecutive trading hours shall not be included in the BCR revenue  |
|  | Only BCR eligible resources will have their FRP uncertainty and forecasted movement settlements counted towards BCR settlement. |
|  | PDR BCR eligible resources having effective Bid Dispatchable Option types of 60 minutes shall be excluded from BCR eligibility. |
|  | For RMR resources subject to new Tariff, variable energy cost opportunity cost adders shall reduce bid cost per MWh assessed under bid cost recovery. |
|  | For RMR resources subject to new Tariff, market revenues in excess of qualified costs shall be subject to a true up. This excess revenue will be subtracted from capacity payments. The qualified cost is the bid cost less variable energy costs opportunity cost adder. |
|  | For a resource that is exempt from wholesale charges in an interval, that resource shall also be ineligible for Bid Cost Recovery in that interval. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calc – IFM Net Amount  |
| Pre-calc – RUC Net Amount |
| Pre-calc – Metered Energy Adjustment Factor |
| Pre-calc – Real Time Price |
| Pre-calc – Start-Up and Minimum Load Cost  |
| Pre-calc – Real Time Energy Quantity |
| CC 491 – Greenhouse Gas Emission Cost Revenue |
| CC 6124 –  |
| CC 6170 – Real Time Spinning Reserve Capacity Settlement |
| CC 6224 –  |
|  CC 6270 – Real Time Non-Spinning Reserve Capacity Settlement |
| CC 6524 –  |
| CC 6570 – Real Time Regulation Up Capacity Settlement |
| CC 6624 –  |
| CC 6670 – Real Time Regulation Down Capacity Settlement |
|  |
|  –  |
| CC 7070 - Flexible Ramp Forecasted Movement Settlement |
| CC 7071 - Daily Flexible Ramp Up Uncertainty Capacity Settlement |
| CC 7081 - Daily Flexible Ramp Down Uncertainty Capacity Settlement |
| CC 6485 – Exceptional Dispatch Hold SOC Uplift Settlement |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| CC 6620 – RUC and RTM Bid Cost Recovery Settlement |
| Pre-calc – Bid Cost Recovery Sequential Netting  |
| Pre-calc – RUC Net Amount |
| CC 7020 – Daily RMR Capacity Payment |

## Inputs – External Systems

| Row # | Variable Name | Description |
| --- | --- | --- |
|  | DispatchIntervalDEBBasisOptimalIIE BrtuT’bI’M’VL’W’R’F’S’mdhcif | Incremental or Decremental RTD Optimal IIE (in MWh) as an expected energy allocation quantity for a given resource, DEB Bid segment and Settlement Interval in association with energy dispatched through RTD. The input is undefined (missing) for a DEB bid segment associated with MSS Load Following Energy.  |
|  | DispatchIntervalDEBBasisFMMOptimalIIE BrtuT’bI’M’VL’W’R’F’S’mdhcif | Incremental or Decremental FMM Optimal IIE (in MWh) as an expected energy allocation quantity based on the Default Energy Bid (DEB) for a given resource and Settlement Interval.  |
|  | BAHourlyResourceIntertieBidOptionsFlag BrtQ’mdh | An integer-valued input that indicates the Intertie Bid Option for a the specified Balancing Authority Area, resource and Trading Hour as follows:1 – DYNAMIC: The resource is a dynamic resource.2 – EB15MIN: Economic bid with participation in 15-minute market.3 – EBHB: Economic bid hourly block.4 – EBHBCHG: Economic bid hourly block with single intra-hour economic schedule change.5 – SSHB: Self scheduled hourly block.6 – SSVER: Self-scheduled variable energy resource forecast. |
|  | DispatchIntervalOptimalIIE BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif | Incremental or Decremental RTD Optimal IIE (in MWh) as an expected energy allocation quantity based on final bid submittal for a given resource and Settlement Interval.  |
|  | DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif | Incremental or Decremental FMM Optimal IIE (in MWh) as an expected energy allocation quantity based on final bid submittal for a given resource and Settlement Interval.  |
|  | DispatchIntervalRTPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | RTD Real Time Pumping Energy (in MWh) as an expected energy allocation quantity for participating pump units for a given resource and Settlement Interval. |
|  | DispatchIntervalFMMPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | FMM Real Time Pumping Energy (in MWh) as an expected energy allocation quantity for participating pump units for a given resource and Settlement Interval. |
|  | DispatchIntervalIIEMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | RTD Minimum Load Energy (in MWh) resulting from a RUC or RTM Commitment and provided as an expected energy quantity for a given resource and Settlement Interval. |
|  | DispatchIntervalFMMMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | FMM Minimum Load Energy (in MWh) resulting from a RUC or RTM Commitment and provided as an expected energy quantity for a given resource and Settlement Interval. |
|  | FMMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif | FMM Optimal Energy Bid Price (in $/MWh) for a given resource and Settlement Interval, based on the Default Energy Bid (DEB) for FMM Optimal Energy. |
|  | RTMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif | Real-time Optimal Energy Bid Price (in $/MWh) for a given resource and Settlement Interval, based on the Default Energy Bid (DEB) for Real-time Optimal Energy dispatched through RTD. The price is undefined (missing) for a DEB bid segment associated with MSS Load Following Energy. |
|  | FMMEnergyBidPriceBrtuT’bI’M’VL’W’R’F’S’mdhcif | FMM Energy Bid Price (in $/MWh) for a given resource and Settlement Interval, based on the final Bid submittal for FMM Energy.  |
|  | RTMMLC BrtuT’I’M’F’S’Ymdhcif | The qualified RTM Minimum Load Costs (in $) for a given resource and Settlement Interval.For a MSG Resource, the RTM Minimum Load Costs are associated with the Configuration ID. For a non-MSG Resource, the costs are simply associated with the resource |
|  | BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif  | A flag (Booean – 0/1) that indicates whether or not RTM Minimum Load Costs for a given resource and Settlement Interval are qualified for cost compensation.Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource. |
|  | RTMEnergyBidPriceBrtuT’bI’M’VL’W’R’F’S’mdhcif | Real-time Energy Bid Price (in $/MWh) for a given resource and Settlement Interval, based on the final Bid submittal for RTM Energy.  |
|  | RegUpCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdhc | Final RTPD Cleared Regulation Up MW. Includes awards based on economic bids and qualified self-provision. This is the amount of Regulation Up the resource is expected to deliver in real-time. Includes both award and QSP, if any. (MW) |
|  | BAHourlyResourceDARegUpCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdh | Day-ahead Regulation Up capacity award (in MW) including final qualified self-provision and market award for resource r in Trading Hour h. |
|  | 15MinuteRTMRegUpAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc | Real-Time Awarded Regulation Up Bid capacity (in MW) for a given resource and FMM Interval. Values are incremental with respect to Day Ahead IFM. |
|  | RegDownCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdhc  | Final RTPD Cleared Regulation Down MW. Includes awards based on economic bids and qualified self-provision. This is the amount of Regulation Down the resource is expected to deliver in real-time. Includes both award and QSP, if any. (MW) |
|  | BAHourlyResourceDARegDownCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdh | Day-ahead Regulation Down capacity award (in MW) including final qualified self-provision and market award for resource r in Trading Hour h. |
|  | 15MinuteRTMRegDownAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc | RTM-awarded Regulation Down Bid capacity (in MW) for a given resource and FMM Interval. Values are incremental with respect to Day Ahead IFM. |
|  | MSSLoadFollowingOverlapFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif | Corresponds to Optimal Energy and Indicates that MSS Load Following Energy is overlapping with Optimal Energy (provided by MQS) for a given resource and Settlement Interval. Overlapping Flag of ‘Y’ or ‘YES’ shall be set to ‘1’; ‘N’ or ‘NO’ shall be set to ‘0’. |
|  | RTMPumpingCostFlagBrtuT’I’M’F’S’mdhcif | Indicates RTM Pumping Costs for a given pumping resource and Settlement Interval are qualified for cost compensation. Qualified = 1, Not qualified = 0. |
|  | CAISO15MinuteRTRegUpMileagePrice mdhc | Provides the RTM Regulation Up Mileage marginal price (in $/MWh) for a given FMM Interval. |
|  | BA15MinuteResourceRegUpPerformanceAccuracyPercentage BrtQ’mdhc | Provides the performance accuracy factor (as a decimal number between 0 and 1) relating to Regulation Up Mileage for a given resource and FMM Interval. |
|  | BA15MinuteResourceAdjustedRegUpMileageQty BrtQ’mdhc | Adjusted Regulation Up Mileage (in MWh) for a given resource and FMM Interval, incorporating any necessary under-response adjustment. |
|  | BAHourlyResourceRTRegUpMileageBidPrice Brtmdh | RTM Regulation Up Mileage Bid Price (in $/MWh) for a given resource and Trading Hour. |
|  | CAISO15MinuteRTRegDownMileagePrice mdhc | Provides the RTM Regulation Down Mileage marginal price (in $/MWh) for a given FMM Interval. |
|  | BA15MinuteResourceRegDownPerformanceAccuracyPercentage BrtQ’mdhc | Provides the performance accuracy factor (as a decimal number between 0 and 1) relating to Regulation Down Mileage for a given resource and FMM Interval. |
|  | BA15MinuteResourceAdjustedRegDownMileageQty BrtQ’mdhc | Adjusted Regulation Down Mileage (in MWh) for a given resource and FMM Interval, incorporating any necessary under-response adjustment. |
|  | BAHourlyResourceRTRegDownMileageBidPrice Brtmdh | RTM Regulation Down Mileage Bid Price (in $/MWh) for a given resource and Trading Hour. |
|  | BA15mResFMMFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhc | A flag with a value of 1 if a resource’s forecasted movement assessment for the FMM interval will be considered for RTM BCR revenue calculation. |
|  | BA5mResRTDFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhcif | A flag with a value of 1 if a resource’s forecasted movement assessment for the RTD interval will be considered for RTM BCR revenue calculation. |
|  | ResourceDailyGeneratorBidOptionsFlag rmd | An integer-valued input that indicates the Generator Bid Option for the specified resource and Trading Hour as follows:4 – DYNAMIC: The resource is a dynamic resource.3 – EB15MIN: Economic bid with participation in 15-minute market.1 – EBHB: Economic bid hourly block. |
|  | RMRResFlag rm | Identifies a resource is an RMR subject to new Tariff and RAAIM assessment. |
|  | ResourceHourlyPreviousEndofHourSOCFlag rmdh | A flag with a value of 1 if a LESR NREM resource has submitted an End of Hour State of Charge in the following interval to be considered in RTM BCR calculation, otherwise has a value of 0 or not created. |
|  | ResourceHourlyCurrentEndofHourSOCFlag rmdh | A flag with a value of 1 if a LESR NREM resource has submitted an End of Hour State of Charge to be considered in RTM BCR calculation, otherwise has a value of 0 or not created. |
|  | ResourceHourlyPreviousRTMSelfScheduleFlag rmdh | A flag with a value of 1 if a LESR NREM resource has submitted a Real Time Market Self Schedule in the following interval to be considered in RTM BCR calculation, otherwise has a value of 0 or not created. |
|  | ResourceHourlyCurrentRTMSelfScheduleFlag rmdh | A flag with a value of 1 if a LESR NREM resource has submitted a Real Time Market Self Schedule to be considered in RTM BCR calculation, otherwise has a value of 0 or not created. |
|  | BAFlexRampExemptAssessmentFlag Bmd | An exemption flag that prevents specific assessment under this charge code. This has a value of 1 for any specific BAID (B) that is not subject to settlement or relevant assessment under this charge code. |
|  | Resource5mAncillaryServiceSOCConstraintFlag rmdhcif | This is a exemption flag based on a market constraint indicator. Value of 1 when active, 0 otherwise. |
|  | Resource15mAncillaryServiceSOCConstraintFlag rmdhc | This is a exemption flag based on a market constraint indicator. Value of 1 when active, 0 otherwise. |

## Inputs – Predecessor Charge Codes or Pre-Calculations

| Row # | Variable Name | Predecessor Charge Code/ Pre-calc Configuration |
| --- | --- | --- |
|  | BAHourlyResourceCircularScheduleFlag BrtF’S’mdh | Pre-calc – IFM Net Amount |
|  | BA15MinResourceRegUpCapacity BrtuT’I’Q’M’F’S’mdhc | Pre-calc – IFM Net AmountRegulation Up capacity (in MW) total over the IFM and Real-Time markets for a given resource and FMM Interval. |
|  | BA15MinResourceRegDownCapacity BrtuT’I’Q’M’F’S’mdhc | Pre-calc – IFM Net AmountRegulation Down capacity (in MW) total over the IFM and Real-Time markets for a given resource and FMM Interval. |
|  | BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | TotalExpectedEnergyFiltered BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | BASettlementIntervalResourceRTPerformanceMetric BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | BAHourlyResourcePersistentDeviationFlag BrtuT’I’M’F’S’mdh | Pre-calc – Metered Energy Adjustment Factor |
|  | ResourceToBAAMapFactor BruT’I’Q’M’F’md | Pre-calc – Metered Energy Adjustment Factor |
|  | MSSToBAAMapFactor BT’I’Q’M’md | Pre-calc – Metered Energy Adjustment Factor |
|  | FMMIntervalLMPPrice BrtuM’mdhc | Pre-calc – Real-time Price |
|  | FMMIntervalMSSPrice uM’mdhc | Pre-calc – Real-time Price |
|  | SettlementIntervalRealTimeLMP BrtuM’mdhcif | Pre-calc – Real-time Price |
|  | SettlementIntervalRealTimeMSSPrice uM’mdhcif  | Pre-calc – Real-time Price |
|  | VEC\_OCAdderPrice Brtmdhcif  | Pre-calc – Real-time Price |
|  | BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost  |
|  | BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost  |
|  | EligibleRTMSUCBrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost  |
|  | AvailableRTMMLCBrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost  |
|  | AvailableRTMPumpingCost BrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost |
|  | AvailableRUCMLCBrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost  |
|  | EligibleRTMSDCBrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost |
|  | EligibleRTMTCBrtuT’I’M’F’S’mdhcif | Pre-calc – Start-Up Cost & Minimum Load Cost |
|  | EIMSettlementIntervalBARTMEntityGHGPaymentAmount BrQ’F’mdhcif | CC 491 – Greenhouse Gas Emission Cost Revenue |
|  |  |  |
|  |  |  |
|  |  |  |
|  | NoPay5MSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6124 –  |
|  | NoPay5MSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6124 –  |
|  | RT15MINSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6170 – Real Time Spinning Reserve Capacity Settlement |
|  | RT15MINSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6170 – Real Time Spinning Reserve Capacity Settlement |
|  | NoPay5MNonSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6224 –  |
|  | NoPay5MNonSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6224 –  |
|  | RT15MINNonSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6270 – Real Time Non-Spinning Reserve Capacity Settlement |
|  | RT15MINNonSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc  | CC 6270 – Real Time Non-Spinning Reserve Capacity Settlement |
|  | NoPay5MRegUpSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6524 –  |
|  | NoPay5MRegUpBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6524 –  |
|  | RT15MINRegUpBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6570 – Real Time Regulation Up Capacity Settlement |
|  | RT15MINRegUpSettlementAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6570 – Real Time Regulation Up Capacity Settlement |
|  | NoPay5MRegDownSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6624 –  |
|  | NoPay5MRegDownBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | CC 6624 –  |
|  | RT15MRegDownBidCostAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6670 – Real Time Regulation Down Capacity Settlement |
|  | RT15MRegDownSettlementAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc | CC 6670 – Real Time Regulation Down Capacity Settlement |
| 1. ‘
 | BA15MinuteResourceHigherDAOrRTRegUpSchedule BrtQ’mdhc |  |
|  | BA15MinuteResourceRTRegUpMileagePayment BrtQ’mdhc |  |
|  | BA15MinuteResourceHigherDAOrRTRegDownSchedule BrtQ’mdhc |  –  |
|  | BA15MinuteResourceRTRegDownMileagePayment BrtQ’mdhc |  –  |
|  | BA5mResFMMFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif | CC 7070 - Flexible Ramp Forecasted Movement Settlement |
|  | BA5mResRTDFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif | CC 7070 - Flexible Ramp Forecasted Movement Settlement |
|  | BA5mResFlexRampUpUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif | CC 7071 - Daily Flexible Ramp Up Uncertainty Capacity Settlement |
|  | BA5mResFlexRampDownUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif | CC 7081 - Daily Flexible Ramp Down Uncertainty Capacity Settlement |
|  | ResourceWholesaleExemptionFlag *rmdhcif* | Pre-calc Real Time Energy Quantity |
|  | RUCNetAmount  BruT’I’M’F’mdhcif | Pre-calc RUC Net Amount |
|  | RUCCost  BrtuT’I’M’F’S’mdhcif | Pre-calc RUC Net Amount |
|  | RUCRevenue  BrtuT’I’M’F’S’mdhcif | Pre-calc RUC Net Amount |
|  | ExceptionalDispatchHoldSOCUpliftSettlementAmount Brmdhcif | CC 6485 - Exceptional Dispatch Hold SOC Uplift Settlement |

## CAISO Formula

For Non-MSS entities and MSS entities with Gross Settlement election:

### BAARTMNetAmount BruT’I’Q’M’F’mdhcif =

(1-BABCRIneligibleFlag rmdhcif)\*(RTMNetAmount BruT’I’M’F’mdhcif + ExceptionalDispatchHoldSOCUpliftSettlementAmount Brmdhcif + EIMSettlementIntervalBARTMEntityGHGPaymentAmount BrQ’F’mdhcif + (1-INTDUPLICATE(BAHourlyBAAResourceFRPNonEligForBCRFlag Brmdh )) \* (EIMSettlementIntervalBCRNetFRPUncertaintyAmount BruT’I’Q’M’F’mdhcif

+ EIMSettlementIntervalBCRNetFRPForecastedMovementAmount BruT’I’M’F’mdhcif ))

Where ResourceToBAAMapFactor BruT’I’Q’M’F’md exists

#### BABCRIneligibleFlag rmdhcif =

Max(ResourceHourlyEOHSelfBCRFlag rmdhicf, DayResourceNonBCRGeneratorBidOptionFlag rmd, ResourceWholesaleExemptionFlag *rmdhcif,*

Resource5minutelyRTMASSOCFlag rmdhcif)

##### ResourceHourlyEOHSelfBCRFlag rmdhicf =

If

((ResourceHourlyEndofHourSOCFlag rmdh= 1

Or

ResourceHourlyRTMSelfScheduleFlag rmdh= 1)

And

RTMNetLESREligibilityAmount rmdhcif > 0)

Then

1

Else

0

##### RTMNetLESREligibilityAmount rmdhcif =

##### Sum over (B,u,T',I',M',F') {RTMNetAmount BruT’I’M’F’mdhcif+ RTMMSSNetLESRAmount BruT’I’M’F’mdhcif}

 Where F' = LESR

##### RTMMSSNetLESRAmount BruT’I’M’F’mdhcif =

Sum over (t,S') {(RTMASNetBidCost BrtuT’I’M’F’S’mdhcif +RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif+RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif)

–(RTMASNetRevenue BrtuT’I’M’F’S’mdhcif + RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif +RTMMSSEnergyRevenue BrtuT’I’M’F’S’mdhcif)}

##### Where T' = MSS and I' = NET and F' = LESR

##### ResourceHourlyEndofHourSOCFlag rmdh =

##### Max(ResourceHourlyPreviousEndofHourSOCFlag rmdh, ResourceHourlyCurrentEndofHourSOCFlag rmdh)

##### ResourceHourlyRTMSelfScheduleFlag rmdh =

##### Max(ResourceHourlyPreviousRTMSelfScheduleFlag rmdh, ResourceHourlyCurrentRTMSelfScheduleFlag rmdh)

##### Resource5minutelyRTMASSOCFlag rmdhcif =

If

((Resource5mAncillaryServiceSOCConstraintFlag rmdhcif = 1

Or

Resource15mAncillaryServiceSOCConstraintFlag rmdhc = 1)

And

RTMNetLESREligibilityAmount rmdhcif > 0)

Then

1

Else

0

#### EIMSettlementIntervalBCRNetFRPUncertaintyAmount BruT’I’Q’M’F’mdhcif =

Sum over (t, S’, L’) (BA5mResFlexRampUpUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif + BA5mResFlexRampDownUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif )

 Where Energy Settlement Type (I’) <> Net

#### EIMSettlementIntervalBCRNetFRPForecastedMovementAmount BruT’I’Q’M’F’mdhcif =

Sum over (t, S’, L’) (BA5mResFMMFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif \* INTDUPLICATE(BA15mResFMMFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhc) + BA5mResRTDFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif \* BA5mResRTDFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhcif )

 Where Energy Settlement Type (I’) <> Net And Resource Type t <> ETIE.

Implementation Note: Do not calculate this amount when BAFlexRampExemptAssessmentFlag Bmd = 1.

#### BAHourlyBAAResourceFRPNonEligForBCRFlag Brmdh =

IF

BAHourlyBAAResourceTotalNonEligForBCRFlag Brmdh >= 1

THEN

BAHourlyBAAResourceFRPNonEligForBCRFlag Brmdh = 1

ELSE

BAHourlyBAAResourceFRPNonEligForBCRFlag Brmdh = 0

END IF

#### BAHourlyBAAResourceTotalNonEligForBCRFlag Brmdh =

Sum over (t, F’, S’) (BAHourlyResourceCircularScheduleFlag BrtF’S’mdh + BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh )

Where Resource Type t In (GEN, ITIE)

### RTMNetAmount BruT’I’M’F’mdhcif =

Sum over (t, S’) ( ( 1 – BAHourlyResourceCircularScheduleFlag BrtF’S’mdh ) \* ( RTMCost BrtuT’I’M’F’S’mdhcif - RTMRevenue BrtuT’I’M’F’S’mdhcif ) )

**Note:**

In design the hourly quantity BAHourlyResourceCircularScheduleFlag BrtF’S’mdh must be duplicated for each Settlement Interval.

### RTMCost BrtuT’I’M’F’S’mdhcif =

( EligibleRTMSUC BrtuT’I’M’F’S’mdhcif +

EligibleRTMSDC BrtuT’I’M’F’S’mdhcif +

EligibleRTMTCBrtuT’I’M’F’S’mdhcif+

RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif +

RTMASNetBidCost BrtuT’I’M’F’S’mdhcif +

RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif)

### Where Entity Type T’ <> MSS or (Entity Type T’ = MSS and Energy Settlement Type I’ <> Net)

### RTMRevenue BrtuT’I’M’F’S’mdhcif =

RTMMarketRevenueAmount BrtuT’I’M’F’S’mdhcif +

RTMASNetRevenue BrtuT’I’M’F’S’mdhcif  +

RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif

### Where Energy Settlement Type I’ <> ‘Net’)

#### RTMMarketRevenueAmount BrtuT’I’M’F’S’mdhcif =

IF

RTMMarketRevenueWithoutPMBrtuT’I’M’F’S’mdhcif < 0

THEN

RTMMarketRevenueAmount BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif \* BASettlementIntervalResourceRTPerformanceMetric BrtuT’I’M’F’S’mdhcif \* RTMMarketRevenueAmountWithoutPM BrtuT’I’M’F’S’mdhcif

ELSE

RTMMarketRevenueAmount BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif \* RTMMarketRevenueAmountWithoutPM BrtuT’I’M’F’S’mdhcif

END IF

Where Exists

TotalExpectedEnergyFiltered BrtuT’I’M’F’S’mdhcif

#### RTMMarketRevenueAmountWithoutPM BrtuT’I’M’F’S’mdhcif =

Sum over (V, L’, W’, R’) (RTMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif
+
BASettlementIntervalResourceRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif
+
BASettlementIntervalResourceRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif )

##### RTMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif =

RTDMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif + FMMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif

###### FMMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif =

(SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif \* DispatchIntervalFMMMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*
FMMIntervalLMPPrice BrtuM’mdhc )

Where Energy Settlement Type I’ <> Net

**Note:**

In the above formula the same value of FMMIntervalLMPPrice BrtuM’mdhc shall be used for each Settlement Interval of an FMM Interval.

###### RTDMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif =

(SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif \* DispatchIntervalIIEMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*
SettlementIntervalRealTimeLMP BrtuM’mdhcif )

Where Energy Settlement Type I’ <> Net

##### BASettlementIntervalResourceRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

 BASettlementIntervalResourceBidRTMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif

###### BASettlementIntervalResourceBidRTMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceBidRTDOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceBidFMMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif

###### BASettlementIntervalResourceBidFMMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) ( (1 – BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh ) \* DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* FMMIntervalLMPPrice BrtuM’mdhc )

Where Resource Type t In (GEN, ITIE)

**Note:**

In the above formula the same value of FMMIntervalLMPPrice BrtuM’mdhc shall be used for each Settlement Interval of an FMM Interval.

BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh =

Sum over (Q’) (

IF

BAHourlyResourceIntertieBidOptionsFlag BrtQ’mdh = 5 (“”SSHB”)

Or

BAHourlyResourceIntertieBidOptionsFlag BrtQ’mdh = 3 (“EBHB”)

Or

BAHourlyResourceIntertieBidOptionsFlag BrtQ’mdh = 4 (“EBHBCHG”)

Or

BAHourlyResourceIntertieBidOptionsFlag BrtQ’mdh = 6 (“SSVER”)

THEN

BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh = 1

ELSE

BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh = 0

END IF

)

**Note:**

BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh shall be calculated and published on daily settlement statements.

DayResourceNonBCRGeneratorBidOptionFlag rmd =

 (

IF

ResourceDailyGeneratorBidOptionsFlag rmd= 1 (“”EBHB”)

THEN

DayResourceNonBCRGeneratorBidOptionFlag rmd = 1

ELSE

DayResourceNonBCRGeneratorBidOptionFlag rmd = 0

END IF

)

**Note:**

DayResourceNonBCRGeneratorBidOptionFlag rmd shall be calculated and published on daily settlement statements.

###### BASettlementIntervalResourceBidRTDOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalOptimalIIE BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* SettlementIntervalRealTimeLMP BrtuM’mdhcif )

Where Resource Type t In (GEN, ITIE)

##### BASettlementIntervalResourceRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif

###### BASettlementIntervalResourceFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalFMMPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*

FMMIntervalLMPPrice BrtuM’mdhc \*

RTMPumpingCostFlag BrtuT’I’M’F’S’mdhcif )

Where Energy Settlement Type I’ <> Net

**Note:**

In the above formula the same value of FMMIntervalLMPPrice BrtuM’mdhc shall be used for each Settlement Interval of an FMM Interval.

###### BASettlementIntervalResourceRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalRTPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*

SettlementIntervalRealTimeLMP BrtuM’mdhcif \*

RTMPumpingCostFlag BrtuT’I’M’F’S’mdhcif )

Where Energy Settlement Type I’ <> Net

### RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif =

IF

 RTMEnergyBidCostWithoutPMBrtuT’I’M’F’S’mdhcif + AvailableRUCMLCBrtuT’I’M’F’S’mdhcif >= 0

THEN

RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif \* BASettlementIntervalResourceRTPerformanceMetric BrtuT’I’M’F’S’mdhcif \* RTMEnergyBidCostWithoutPMBrtuT’I’M’F’S’mdhcif

ELSE

RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif \* RTMEnergyBidCostWithoutPMBrtuT’I’M’F’S’mdhcif

END IF

Where Exists

TotalExpectedEnergyFiltered BrtuT’I’M’F’S’mdhcif

#### RTMEnergyBidCostforRUCMLCBrtuT’I’M’F’S’mdhcif =

RTMPlusFMMOptimalIIEEnergyBidCost BrtuT’I’M’F’S’mdhcif
+ AvailableRUCMLCBrtuT’I’M’F’S’mdhcif

#### RTMEnergyBidCostWithoutPMBrtuT’I’M’F’S’mdhcif =

RTMPlusFMMOptimalIIEEnergyBidCost BrtuT’I’M’F’S’mdhcif
+ AvailableRTMMLCBrtuT’I’M’F’S’mdhcif
+ AvailableRTMPumpingCostBrtuT’I’M’F’S’mdhcif

##### RTMPlusFMMOptimalIIEEnergyBidCost BrtuT’I’M’F’S’mdhcif =

Sum over (V, L’, W’, R’) (BASettlementIntervalResourceRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif )

###### BASettlementIntervalResourceRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

If

BAHourlyResourcePersistentDeviationFlag BrtuT’I’M’F’S’mdh = 1

Then

BASettlementIntervalResourceRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceMinimizedEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif

Else

BASettlementIntervalResourceRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

SettlementIntervalFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif

End If

###### BASettlementIntervalResourceMinimizedEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Min(SettlementIntervalDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif, SettlementIntervalFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif, SettlementIntervalLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif)

 SettlementIntervalDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceUDCDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif

BASettlementIntervalResourceUDCDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (b) (BASettlementIntervalResourceDEBEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceDEBEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif )

Where Entity Type T’ <> MSS (non-MSS entities) And Resource Type t in (GEN, ITIE)

BASettlementIntervalResourceDEBEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

(1 – BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh ) \* DispatchIntervalDEBBasisFMMOptimalIIE BrtuT’bI’M’VL’W’R’F’S’mdhcif \*

[IF FMMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

THEN

0

ELSE

(FMMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif - VEC\_OCAdderPrice Brtmdhcif )

END IF]

BASettlementIntervalResourceDEBEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

DispatchIntervalDEBBasisOptimalIIE BrtuT’bI’M’VL’W’R’F’S’mdhcif \*

[IF RTMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

THEN

0

ELSE

(RTMDefaultOptimalEnergyBidBasedPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif - VEC\_OCAdderPrice Brtmdhcif )

END IF]

BASettlementIntervalResourceMSSDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

 Sum over (b) ( BASettlementIntervalResourceDEBEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceDEBEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif )

Where Entity Type T’ = MSS (MSS entities) And Resource Type t In (GEN, ITIE)

SettlementIntervalFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceUDCFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif

BASettlementIntervalResourceUDCFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (b) ( BASettlementIntervalResourceFinalBidEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceFinalBidEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif )

Where Entity Type T’ <> MSS (non-MSS entities) And Resource Type t In (GEN, ITIE)

BASettlementIntervalResourceFinalBidEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) ( (1 – BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh ) \* DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif)

FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif =

If

FMMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

(

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif >= 0

Or

DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif > 0

)

Then

IF

I’ (Energy Settlement Type) = Net

THEN

FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif = FMMIntervalMSSPrice uM’mdhc

ELSE

FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif = FMMIntervalLMPPrice BrtuM’mdhc

END IF

Else

FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif =

[IF FMMEnergyBidPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

THEN

0

ELSE

(FMMEnergyBidPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif - VEC\_OCAdderPrice Brtmdhcif )

END IF]

End If

Where Exists

DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif

**Note:**

In the above formula the same values of FMMIntervalLMPPrice BrtuM’mdhc and FMMIntervalMSSPrice uM’mdhc shall be used for each Settlement Interval of an FMM Interval (i.e., the FMMIntervalLMPPrice BrtuM’mdhc or FMMIntervalMSSPrice uM’mdhc value shall be duplicated for each 5-minute Settlement Interval of the 15-minute FMM Interval).

FMMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif =

FMMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif

FMMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif =

FMMEnergyMissingBidPriceFlag\_View BrtuT’bI’M’VL’W’R’F’S’mdhcif

**Notes:**

1. Variable FMMEnergyMissingBidPriceFlag\_View BrtuT’bI’M’VL’W’R’F’S’mdhcif is the output of view View\_FMMEnergyMissingBidPriceFlag (that is run during the configuration’s execution). The view indicates for each Settlement Interval whether a market bid exists for the Energy bid segment designated by variable DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif.
2. View View\_FMMEnergyMissingBidPriceFlag will return the value 1, if an only if a bid price does not exist for the Energy bid segment designated by variable DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif. If the bid price is not missing for the designated Energy bid segment, then the view will return the value 0.
3. Variable FMMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif is not reportable in XML-based settlement statement files.

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif =

Sum over (Y) (RTMMLC BrtuT’I’M’F’S’Ymdhcif \* BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

BASettlementIntervalResourceFinalBidEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalOptimalIIE BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif )

RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif =

If

RTMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

(

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif >= 0

Or

DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif > 0

)

Then

IF

I’ (Energy Settlement Type) = Net

THEN

RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif = SettlementIntervalRealTimeMSSPrice uM’mdhcif

ELSE

RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif = SettlementIntervalRealTimeLMP BrtuM’mdhcif

END IF

Else

RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif =

[IF RTMEnergyBidPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

THEN

0

ELSE

(RTMEnergyBidPrice BrtuT’bI’M’VL’W’R’F’S’mdhcif - VEC\_OCAdderPrice Brtmdhcif )

END IF]

End If

Where Exists

DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif

RTMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif =

RTMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif

RTMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif =

RTMEnergyMissingBidPriceFlag\_View BrtuT’bI’M’VL’W’R’F’S’mdhcif

**Notes:**

1. Variable RTMEnergyMissingBidPriceFlag\_View BrtuT’bI’M’VL’W’R’F’S’mdhcif is the output of view View\_RTMEnergyMissingBidPriceFlag (that is run during the configuration’s execution). The view indicates for each Settlement Interval whether a market bid exists for the Energy bid segment designated by variable DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif.
2. View View\_RTMEnergyMissingBidPriceFlag will return the value 1, if an only if a bid price does not exist for the Energy bid segment designated by variable DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif. If the bid price is not missing for the designated Energy bid segment, then the view will return the value 0.
3. Variable RTMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif is not reportable in XML-based settlement statement files.

BASettlementIntervalResourceMSSFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

IF

MSSLoadFollowingOverlapFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

THEN

BASettlementIntervalResourceMSSFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif = 0

ELSE

BASettlementIntervalResourceMSSFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (b) ( BASettlementIntervalResourceFinalBidEligibleRTDOptimalIIEBidCost + BASettlementIntervalResourceFinalBidEligibleFMMOptimalIIEBidCost )

END IF

Where Entity Type T’ = MSS (MSS entities) And Resource Type t In (GEN, ITIE)

SettlementIntervalLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceUDCLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif

BASettlementIntervalResourceUDCLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (b) ( BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif )

Where Entity Type T’ <> MSS (non-MSS entities)

BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

IF

MSSLoadFollowingOverlapFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

Or

(

RTMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif < 0

And

DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif <= 0

)

THEN

BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

ELSE

BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif = Sum over (Q’) (BASettlementIntervalResourceBidRTMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif )

END IF

Where Energy Settlement Type I’ <> NET

BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

IF

FMMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif < 0

And

DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif <= 0

THEN

BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

ELSE

BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (BASettlementIntervalResourceBidFMMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif )

END IF

Where Energy Settlement Type I’ <> NET

BASettlementIntervalResourceMSSLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (b) ( BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSNetLMPEligibleRTMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif)

Where Entity Type T’ = MSS (MSS entities)

BASettlementIntervalResourceMSSNetLMPEligibleRTMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceMSSNetLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSNetLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif

BASettlementIntervalResourceMSSNetLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

IF

MSSLoadFollowingOverlapFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

Or

(

RTMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif < 0

And

DispatchIntervalOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif <= 0

)

THEN

BASettlementIntervalResourceMSSNetLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

ELSE

BASettlementIntervalResourceMSSNetLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) BASettlementIntervalResourceMSSNetRTDOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif

END IF

Where Energy Settlement Type I’ = Net

BASettlementIntervalResourceMSSNetLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

IF

FMMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif = 1

And

BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif < 0

And

DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif <= 0

THEN

BASettlementIntervalResourceMSSNetLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif = 0

ELSE

BASettlementIntervalResourceMSSNetLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) BASettlementIntervalResourceMSSNetFMMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif

END IF

Where Energy Settlement Type I’ = Net

### For Non-MSS and MSS entities, Eligible MLE and Eligible Optimal Energy is the following:

#### SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif =

If (BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif = 0

And

BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif = 0)

Then

SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif = 0

Else

SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif = 1

End If

### For MSS entities with Net Settlement election:

#### BAARTMMSSNetBCRAmount BT’I’Q’M’mdhcif =

RTMMSSNetBCRAmount BT’I’M’mdhcif

+ RTMMSSNetBCRFlexRampUncertaintyAmount BT’I’M’mdhcif

+ EIMSettlementIntervalBCRMSSNetFRPForecastedMovementAmount BT’I’M’mdhcif

Where MSSToBAAMapFactor BT’I’Q’M’md exists.

##### RTMMSSNetBCRFlexRampUncertaintyAmount BT’I’M’mdhcif=

Sum over (r, t, u, F’, S’, Q’, L’) (1-BABCRIneligibleFlag rmdhcif)\*( BA5mResFlexRampUpUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif + BA5mResFlexRampDownUncertaintyAwardAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif)

Where Energy Settlement Type I’ = Net

##### EIMSettlementIntervalBCRMSSNetFRPForecastedMovementAmount BT’I’M’mdhcif =

Sum over (r, t, u, F’, S’, Q’, L’) (1-BABCRIneligibleFlag rmdhcif)\* (BA5mResFMMFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif \* INTDUPLICATE(BA15mResFMMFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhc) + BA5mResRTDFlexRampForecastedMovementAssessmentAmount BrtQ’uT’I’M’L’F’S’mdhcif \* BA5mResRTDFlexRampForecastedMovementBCREligFlag BrtI’M’F’S’mdhcif )

Where Energy Settlement Type I’ = Net And Resource Type t <> ETIE

#### RTMMSSNetBCRAmount BT’I’M’mdhcif =

RTMMSSNetEnergyBidCostAmount BT’I’M’mdhcif +

RTMMSSNetASAmount BT’I’M’mdhcif+

RTMMSSNetRegMileageBidCostAmount BT’I’M’mdhcif

#### RTMMSSNetASAmount BT’I’M’mdhcif =

Sum over (r, t, u, F’, S’) (1-BABCRIneligibleFlag rmdhcif)\*(RTMASNetBidCost BrtuT’I’M’F’S’mdhcif –

RTMASNetRevenue BrtuT’I’M’F’S’mdhcif )

#### Where Entity Type T’ = MSS and Energy Settlement Type I’ = Net

#### RTMMSSNetEnergyBidCostAmount BT’I’M’mdhcif =

Sum over (r, t, u, F’, S’) (1-BABCRIneligibleFlag rmdhcif)\*( EligibleRTMSUC BrtuT’I’M’F’S’mdhcif+
EligibleRTMSDC BrtuT’I’M’F’S’mdhcif +

EligibleRTMTCBrtuT’I’M’F’S’mdhcif +

RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif –

RTMMSSEnergyRevenue BrtuT’I’M’F’S’mdhcif )

Where Entity Type T’ = MSS and Energy Settlement Type I’ = Net

#### RTMMSSEnergyRevenue BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResouceNonRMREnergyRatio BrtuT’I’M’F’S’mdhcif \* BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmount BrtT’uI’M’F’S’mdhcif

Where Exists

TotalExpectedEnergyFiltered BrtuT’I’M’F’S’mdhcif

#### BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmount BrtT’uI’M’F’S’mdhcif =

IF

BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmountWithoutPM BrtT’uI’M’VL’W’R’F’S’mdhcif < 0

THEN

BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif =
Sum over (V, L’, W’ R’) (BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmountWithoutPM BrtuT’I’M’VL’W’R’F’S’mdhcif \* BASettlementIntervalResourceRTPerformanceMetric BrtuT’I’M’F’S’mdhcif )

ELSE

BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif =
Sum over (V, L’, W’ R’) (BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmountWithoutPM BrtuT’I’M’VL’W’R’F’S’mdhcif )

END IF

Where Entity Type T’ = MSS And Energy Settlement Type I’ = Net

#### BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmountWithoutPM BrtT’uI’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceMSSNetRTMIIEMinimumLoadEnergyRevenue BrtT’uI’M’VL’W’R’F’S’mdhcif +

BASettlementIntervalResourceMSSNetRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif +

BASettlementIntervalResourceMSSNetRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif

##### BASettlementIntervalResourceMSSNetRTMIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceMSSNetRTDIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSNetFMMIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif

###### BASettlementIntervalResourceMSSNetFMMIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif \* DispatchIntervalFMMMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*
FMMIntervalMSSPrice uM’mdhc )

Where Entity Type T’ = MSS And Energy Settlement Type I’ = Net

**Note:**

In the above formula the same value of FMMIntervalMSSPrice uM’mdhc applies to all 5-minute intervals **f** of FMM Interval **c**.

###### BASettlementIntervalResourceMSSNetRTDIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) ( SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif \* DispatchIntervalIIEMinimumLoadEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*
SettlementIntervalRealTimeMSSPrice uM’mdhcif )

Where Entity Type T’ = MSS And Energy Settlement Type I’ = Net

##### BASettlementIntervalResourceMSSNetRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif = Sum over (b) (BASettlementIntervalResourceMSSNetRTDOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSNetFMMOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif )

###### BASettlementIntervalResourceMSSNetFMMOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) ( (1 – BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh ) \* DispatchIntervalFMMOptimalIIEBrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* FMMIntervalMSSPrice uM’mdhc )

Where Resource Type t In (GEN, ITIE) And Entity Type T’ = MSS And Energy Settlement Type I’ = Net

**Note:**

In the above formula the same value of FMMIntervalMSSPrice uM’mdhc applies to all 5-minute intervals **f** of FMM Interval **c**.

###### BASettlementIntervalResourceMSSNetRTDOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalOptimalIIE BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif \* SettlementIntervalRealTimeMSSPrice uM’mdhcif )

Where Resource Type t In (GEN, ITIE) And Entity Type T’ = MSS And Energy Settlement Type I’ = Net

##### BASettlementIntervalResourceMSSNetRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

BASettlementIntervalResourceMSSNetRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif + BASettlementIntervalResourceMSSNetFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif

###### BASettlementIntervalResourceMSSNetFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalFMMPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*

RTMPumpingCostFlagBrtuT’I’M’F’S’mdhcif \*

FMMIntervalMSSPrice uM’mdhc )

Where Entity Type T’ = MSS And Energy Settlement Type I’ = Net

**Note:**

In the above formula the same value of FMMIntervalMSSPrice uM’mdhc applies to all 5-minute intervals **f** of FMM Interval **c**.

###### BASettlementIntervalResourceMSSNetRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif =

Sum over (Q’) (DispatchIntervalRTPumpingEnergy BrtuT’I’Q’M’VL’W’R’F’S’mdhcif \*

RTMPumpingCostFlagBrtuT’I’M’F’S’mdhcif \*

SettlementIntervalRealTimeMSSPrice uM’mdhcif)

Where Entity Type T’ = MSS And Energy Settlement Type I’ = Net

###### RTMMSSNetRegMileageBidCostAmount BT’I’M’mdhcif=

Sum over (r, t, u, F’, S’) (1-BABCRIneligibleFlag rmdhcif)\* (RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif–

RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif)

Where Entity Type T’ = MSS and Energy Settlement Type I’ = Net And Resource Type t In (GEN , ITIE)

### Net AS Bid Costs and Net AS Revenues are the following:

#### RTMASNetBidCost BrtuT’I’M’F’S’mdhcif =

Sum over (Q’,V, L’, W’, R’) (max (0, RTMASBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif –

ASNoPayQtyBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif ) )

Where Q’ = ‘CISO’

#### RTMASNetRevenue BrtuT’I’M’F’S’mdhcif =

Sum over (Q’,V, L’, W’, R’) (max 0, ( RTMASRevenueAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif – ASNoPayAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif ) )

Where Q’ = ‘CISO’

#### RTMASBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif =

(-1/3) \* (RT15MINSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MINNonSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MINRegUpBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MRegDownBidCostAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc )

#### ASNoPayQtyBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif =

NoPay5MSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MNonSpinBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MRegUpBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MRegDownBidCostAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif

#### RTMASRevenueAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif =

(-1/3) \* (RT15MINSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MINNonSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MINRegUpSettlementAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc +

RT15MRegDownSettlementAmountBrtuT’I’Q’M’VL’W’R’F’S’mdhc )

#### ASNoPayAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif =

NoPay5MSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MNonSpinSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MRegUpSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif +

NoPay5MRegDownSettlementAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif

**RTM Regulation Mileage Bid Cost**

### RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif =

SUM(Q’) RTMRegUpMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif + RTMRegDownMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif

Where Q’ = ‘CISO’

**RTM Regulation Up Mileage Bid Cost**

#### RTMRegUpMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif =

(1/3) \* (BA15MinResourceRTMRegUpMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc + BA15MinResourceRTMRegUpMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc )

**RTM Regulation Up Mileage Self-Provided Bid Cost**

#### BA15MinResourceRTMRegUpMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =

IF BA15MinResourceRegUpCapacity BrtuT’I’Q’M’F’S’mdhc <> 0

THEN

BA15MinResourceRTMRegUpMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =
(CAISO15MinuteRTRegUpMileagePrice mdhc \* BA15MinuteResourceRegUpPerformanceAccuracyPercentage BrtQ’mdhc \* BA15MinuteResourceAdjustedRegUpMileageQtyBrtQ’mdhc \* (BA15MinResourceAdditionalRTMRegUpQSPCapacity BrtuT’I’Q’M’F’S’mdhc / BA15MinuteResourceHigherDAOrRTRegUpSchedule BrtQ’mdhc ) )

ELSE

BA15MinResourceRTMRegUpMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc = 0

END IF

Where Exists

BA15MinResourceAdditionalRTMRegUpQSPCapacity BrtuT’I’Q’M’F’S’mdhc

#### BA15MinResourceAdditionalRTMRegUpQSPCapacity BrtuT’I’Q’M’F’S’mdhc =

Sum over (V, L’, W’, R’) max(0, (RegUpCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdhc – (INTDUPLICATE(BAHourlyResourceDARegUpCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdh ) + 15MinuteRTMRegUpAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc ) ) )

Where

Resource Type t In (GEN, ITIE)

And Where Exists

RegUpCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’hc

**RTM Regulation Up Mileage Awarded Bid Cost**

#### BA15MinResourceRTMRegUpMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =

IF BA15MinResourceRegUpCapacity BrtuT’I’Q’M’F’S’mdhc <> 0

THEN

BA15MinResourceRTMRegUpMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =
(BAHourlyResourceRTRegUpMileageBidPrice Brtmdh \* BA15MinuteResourceRegUpPerformanceAccuracyPercentage BrtQ’mdhc \* BA15MinuteResourceAdjustedRegUpMileageQty BrtQ’mdhc \* (BA15MinResourceRTMRegUpAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc / BA15MinuteResourceHigherDAOrRTRegUpSchedule BrtQ’mdhc ) )

ELSE

BA15MinResourceRTMRegUpMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc = 0

END IF

Where Exists

BA15MinResourceRTMRegUpAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc

**Note:**

In design the hourly quantity BAHourlyResourceRTRegUpMileageBidPrice Brtmdh must be duplicated for each 15-minute RTM interval.

#### BA15MinResourceRTMRegUpAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc =

Sum over (V, L’, W’, R’) 15MinuteRTMRegUpAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc

Where

Resource Type t In (GEN, ITIE)

**RTM Regulation Down Mileage Bid Cost**

#### RTMRegDownMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif =

(1/3) \* (BA15MinResourceRTMRegDownMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc + BA15MinResourceRTMRegDownMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc )

**RTM Regulation Down Mileage Self-Provided Bid Cost**

#### BA15MinResourceRTMRegDownMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =

IF BA15MinResourceRegDownCapacity BrtuT’I’Q’M’F’S’mdhc <> 0

THEN

BA15MinResourceRTMRegDownMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =
(CAISO15MinuteRTRegDownMileagePrice mdhc \* BA15MinuteResourceRegDownPerformanceAccuracyPercentage BrtQ’mdhc \* BA15MinuteResourceAdjustedRegDownMileageQtyBrtQ’mdhc \* (BA15MinResourceAdditionalRTMRegDownQSPCapacity BrtuT’I’Q’M’F’S’mdhc / BA15MinuteResourceHigherDAOrRTRegDownSchedule BrtQ’mdhc ) )

ELSE

BA15MinResourceRTMRegDownMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc = 0

END IF

Where Exists

BA15MinResourceAdditionalRTMRegDownQSPCapacity BrtuT’I’Q’M’F’S’mdhc

#### Where BA15MinResourceAdditionalRTMRegDownQSPCapacity BrtuT’I’Q’M’F’S’mdhc =

Sum over (V, L’, W’, R’) max(0, (RegDownCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’hc – (INTDUPLICATE(BAHourlyResourceDARegDownCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’mdh ) + 15MinuteRTMRegDownAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc ) ) )

Where

Resource Type t In (GEN, ITIE)

And Where Exists

RegDownCapacitySchedule BrtuT’I’Q’M’VL’W’R’F’S’hc

**RTM Regulation Down Mileage Awarded Bid Cost**

#### BA15MinResourceRTMRegDownMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =

IF BA15MinResourceRegDownCapacity BrtuT’I’Q’M’F’S’mdhc <> 0

THEN

BA15MinResourceRTMRegDownMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc =
(BAHourlyResourceRTRegDownMileageBidPrice Brtmdh \* BA15MinuteResourceRegDownPerformanceAccuracyPercentage BrtQ’mdhc \* BA15MinuteResourceAdjustedRegDownMileageQty BrtQ’mdhc \* (BA15MinResourceRTMRegDownAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc / BA15MinuteResourceHigherDAOrRTRegDownSchedule BrtQ’mdhc ) )

ELSE

BA15MinResourceRTMRegDownMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc = 0

END IF

Where Exists

BA15MinResourceRTMRegDownAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc

**Note:**

In design the hourly quantity BAHourlyResourceRTRegDownMileageBidPrice Brtmdh must be duplicated for each 15-minute RTM interval.

#### BA15MinResourceRTMRegDownAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc =

Sum over (V, L’, W’, R’) 15MinuteRTMRegDownAwardedBidQuantity BrtuT’I’Q’M’VL’W’R’F’S’mdhc

Where

Resource Type t In (GEN, ITIE)

**RTM Regulation Mileage Revenue**

### RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif =

SUM(Q’) RTMRegUpMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif + RTMRegDownMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif

Where Q’ = ‘CISO’

**RTM Regulation Up Mileage Revenue**

#### RTMRegUpMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif =

(-1/3) \* BA15MinuteResourceRTRegUpMileagePayment BrtQ’mdhc

Where Exists

BA15MinResourceRegUpCapacity BrtuT’I’Q’M’F’S’mdhc

**RTM Regulation Down Mileage Revenue**

#### RTMRegDownMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif =

(-1/3) \* BA15MinuteResourceRTRegDownMileagePayment BrtQ’mdhc

Where Exists

BA15MinResourceRegDownCapacity BrtuT’I’Q’M’F’S’mdhc

**RMR Related Calculations:**

### RMR excess revenue calculations:

#### NonMSSRMRRTMNetCostAmount Brmdhcif =

Average over (u, T’, I’, Q’, M’, F’,) (-1)\*BAARTMNetAmount BruT’I’Q’M’F’mdhcif

Where Q’ = ‘CISO’

 Note: This intermediate calculation will not be reportable. Only the variable, RMRDayRTMExcessRevAmount rmd ,defined below, will be reportable.

#### NonMSSRMRRUCNetCostAmount Brmdhcif =

Average over (u, T’, I’, M’, F’) (-1) \* RUCNetAmount BruT’I’M’F’mdhcif

 Note: This intermediate calculation will not be reportable. Only the variable, RMRDayRTMExcessRevAmount rmd ,defined below, will be reportable.

#### MSSNetRMRRTMNetCostAmount Brmdhcif =

Average over (t, u, T’, I’, M’, F’, S’)

(-1)\*{

(EligibleRTMSUC BrtuT’I’M’F’S’mdhcif + EligibleRTMSDC BrtuT’I’M’F’S’mdhcif +

EligibleRTMTC BrtuT’I’M’F’S’mdhcif + RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif –

RTMMSSEnergyRevenue BrtuT’I’M’F’S’mdhcif )

+ (RTMASNetBidCost BrtuT’I’M’F’S’mdhcif – RTMASNetRevenue BrtuT’I’M’F’S’mdhcif )

+ (RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif–

RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif)

}

Where Entity Type T’ = MSS and Energy Settlement Type I’ = Net

Note: This intermediate calculation will not be reportable. Only the variable, RMRDayRTMExcessRevAmount rmd ,defined below, will be reportable.

#### MSSNetRMRRUCNetCostAmount Brmdhcif =

Average over (t, u, T’, I’, M’, F’, S’)

(-1) \* (RUCCost BrtuT’I’M’F’S’mdhcif - RUCRevenue BrtuT’I’M’F’S’mdhcif)

Where Entity Type T’ = MSS and Energy Settlement Type I’ = Net

 Note: This intermediate calculation will not be reportable. Only the variable, RMRDayRTMExcessRevAmount rmd ,defined below, will be reportable.

#### RMRDayRTMNetCostAmount rmd =

Sum over (B, h, c, i, f) (NonMSSRMRRTMNetCostAmount Brmdhcif + MSSNetRMRRTMNetCostAmount Brmdhcif + NonMSSRMRRUCNetCostAmount Brmdhcif + MSSNetRMRRUCNetCostAmount Brmdhcif)

Note: This intermediate calculation will not be reportable. Only the variable, RMRDayRTMExcessRevAmount rmd ,defined below, will be reportable.

#### RMRDayRTMExcessRevAmount rmd =

Max(0, RMRDayRTMNetCostAmount rmd)

where RMRResFlag rm exists.

 Note: This will be reportable.

## Outputs

| ID | Name | Description |
| --- | --- | --- |
|  | In addition to any outputs listed below, all inputs shall be included as outputs |  |
|  | BAARTMNetAmount BruT’I’Q’M’F’mdhcif | RTM Net Amount associated to its BAA. |
|  |  |  |
|  |  |  |
|  | EIMSettlementIntervalBCRNetFRPUncertaintyAmount BruT’I’Q’M’F’mdhcif | The net contribution from Flex Ramp Product (FRP) payments and charges due to uncertainty awards. This does not include any rescission of FRP payments and charges.This exclude resources under an MSS that has elected net settlement.  |
|  | EIMSettlementIntervalBCRNetFRPForecastedMovementAmount BruT’I’Q’M’F’mdhcif | The net contribution from Flex Ramp Product (FRP) payments and charges due to BCR eligible forecasted movement. This does not include any rescission of FRP payments and charges.This exclude resources under an MSS that has elected net settlement.  |
|  | RTMMSSNetBCRFlexRampUncertaintyAmount BT’I’M’mdhcif | The net contribution from Flex Ramp Product (FRP) payments and charges due to uncertainty awards. This does not include any rescission of FRP payments and charges.This include resources under an MSS that has elected net settlement. |
|  | EIMSettlementIntervalBCRMSSNetFRPForecastedMovementAmount BT’I’M’mdhcif | The net contribution from Flex Ramp Product (FRP) payments and charges due to BCR eligible forecasted movement. This does not include any rescission of FRP payments and charges.This include resources under an MSS that has elected net settlement. |
|  | BAHourlyBAAResourceFRPNonEligForBCRFlag Brmdh | A flag that identifies whether a resource’s FRP uncertainty and forecasted movement assessments should not be included in BCR. The output = 1 to indicate that the assessments will not partake in BCR and is blank or zero otherwise (when the assessments will partake in BCR). |
|  | BAHourlyBAAResourceTotalNonEligForBCRFlag Brmdh | Intermediate calculation to determine whether a resource has a circular schedule or has selected a non-BCR intertie bidding option. |
|  | RTMNetAmount BruT’I’M’F’mdhcif | The net difference (in $) of RTM Cost and RTM Revenue for a given resource and Settlement Interval. This quantity can be positive or negative or zero representing a shortfall or surplus respectively. |
|  | RTMCost BrtuT’I’M’F’S’mdhcif | The costs (in $) associated with RTM including the Start Up Cost, Minimum Load cost, Transition Cost, AS cost, and Energy Bid Cost, for a given resource and Settlement Interval. |
|  | RTMRevenue BrtuT’I’M’F’S’mdhcif | The RTM revenue (in $), including the Energy revenue and AS revenue, for a given resource and Settlement Interval. |
|  | RTMMarketRevenueAmount BrtuT’I’M’F’S’mdhcif | The RTM Market Revenue Amount (in $) – including RT Optimal Energy, RT Pumping revenue, and RT Minimum Load revenue – for a given resource and Settlement Interval. |
|  | RTMMarketRevenueAmountWithoutPM BrtuT’I’M’F’S’mdhcif | The RTM Market Revenue Amount prior to application of the Real-time Performance Metric. The amount includes RT Optimal Energy, RT Pumping revenue, and RT Minimum Load revenue for a given resource and Settlement Interval. |
|  | RTMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif | The RTM Minimum Load Energy Revenue Amount for a given resource and Settlement Interval. |
|  | FMMMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif | The FMM Minimum Load Energy Revenue Amount for a given resource and Settlement Interval. |
|  | RTDMinLoadEnergyRevenueAmount BrtuT’I’M’VL’W’R’F’S’mdhcif | The RTD Minimum Load Energy Revenue Amount for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTM Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceBidRTMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif | The RTM Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceBidFMMOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif | The FMM Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given resource and Settlement Interval. |
|  | BAHourlyBAAResourceNonBCRIntertieBidOptionFlag Brtmdh | A flag (as a Boolean 0/1 value) that, when = 1, indicates that for a given resource (of a Balancing Authority Area) and specified Trading Hour the resource1. has submitted an import or export schedule for which applies the bidding option of Self-scheduled hourly block, Economic bid hourly block, or Economic bid hourly block with single intra-hour economic schedule change, or
2. is a Variable Energy Resource (VER) with an FMM import schedule that represents the resource’s own Energy forecast.

This output will be calculated and published on daily settlement statements. |
|  | BASettlementIntervalResourceBidRTDOptimalIIERevenueAmount BrtuT’bI’M’VL’W’R’F’S’mdhcif | The RTD Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTM Pumping Energy Revenue Amount (in $) associated with a Pumped-Storage Hydro Unit for a given resource and Settlement Interval i. |
|  | BASettlementIntervalResourceFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The FMM Pumping Energy Revenue Amount (in $) associated with a Pumped-Storage Hydro Unit for a given resource and Settlement Interval i. |
|  | BASettlementIntervalResourceRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTD Pumping Energy Revenue Amount (in $) associated with a Pumped-Storage Hydro Unit for a given resource and Settlement Interval i. |
|  | RTMEnergyBidCost BrtuT’I’M’F’S’mdhcif | The RTM Energy Bid Cost (in $) for a given resource and Settlement Interval. |
|  | RTMEnergyBidCostWithoutPMBrtuT’I’M’F’S’mdhcif | Sum (in $) of the RTM Optimal IIE Bid Cost, FMM Energy Bid Cost, eligible RTM Minimum Load Costs and eligible RTM Pumping Costs (all without the RT PM applied) for a given resource and Settlement Interval. The Real-time Performance metric is applied to the calculated value. |
|  | RTMEnergyBidCostforRUCMLCBrtuT’I’M’F’S’mdhcif | Sum (in $) of the RTM Optimal IIE Bid Cost, FMM Energy Bid Cost and eligible RUC Minimum Load Costs (all without the RT PM applied) for a given resource and Settlement Interval. Based on the arithmetic sign of the stated output, the Real-time Performance metric is applied to the available RUC MLC that is calculated in a successor calculation. |
|  | RTMPlusFMMOptimalIIEEnergyBidCost BrtuT’I’M’F’S’mdhcif | Sum (in $) of the RTM Optimal Instructed Imbalance Energy Bid Cost and the FMM Optimal Energy Bid Cost for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | The RTM Optimal Instructed Imbalance Energy Bid Cost (in $) for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceMinimizedEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) of Optimal Energy for a given resource and Settlement Interval that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations and that is calculated to equal the minimum of the bid costs based on the Default Energy Bid (DEB), Final Bid and LMP for incremental optimal IIE energy and the maximum of same bid costs for decremental optimal IIE energy.  |
|  | SettlementIntervalDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated by multiplication of the energy with the Default Energy Bid price. |
|  | BASettlementIntervalResourceUDCDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for UDC-provided RTM Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations of a given resource and Settlement Interval, and that is calculated as the sum of the FMM and RTD energy costs that have been derived using Default Energy Bid prices. |
|  | BASettlementIntervalResourceDEBEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for FMM Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations of a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in FMM by multiplying the energy of the Default Energy Bid with its corresponding Default Energy Bid price. |
|  | BASettlementIntervalResourceDEBEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for RTD Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations of a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in RTD by multiplying the energy of the Default Energy Bid with its corresponding Default Energy Bid price. |
|  | BASettlementIntervalResourceMSSDEBEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for MSS-provided Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated by multiplication of the energy with the Default Energy Bid price. Optimal Energy that overlaps with Load Following Energy is not eligible for Bid Cost Recovery and is not represented by the output. |
|  | SettlementIntervalFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) of Optimal Energy for a given resource and Settlement Interval that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations and that is calculated as the sum of the UDC Final Bid Eligible RTM Optimal IIE Bid Cost and MSS Final Bid Eligible RTM Optimal IIE Bid Cost.  |
|  | BASettlementIntervalResourceUDCFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for UDC-provided Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated as the sum of the final Bid FMM Optimal Energy Bid cost and the final Bid RTD Optimal Energy Bid cost. |
|  | BASettlementIntervalResourceFinalBidEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for FMM Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations of a given resource and Settlement Interval, and that is calculated for each given RTM Bid segment dispatched in FMM by multiplying the energy of the Final Energy Bid with its corresponding Final Energy Bid price. |
|  | FMMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif | Energy Bid Price (in $/MWh) associated with a resource, Energy Bid segment and Settlement Interval for Energy dispatched in FMM that represents 1. the Bid price as submitted by the Business Associate for the dispatched Energy in the real-time market, and thereafter possibly modified by the MPM process,
2. or, in the case where a Bid price was not submitted for the dispatched Energy, a Bid price established based on (1) the arithmetic polarity (+/-/0) of the FMM Optimal Instructed Imbalance Energy and RTM MLC for the resource and Settlement Interval and (2) whether or not the resource is associated with a net-settled MSS entity.
 |
|  | FMMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif | A flag indicator (Boolean – 0/1) that denotes a missing Energy Bid segment price for Energy dispatched in FMM for a given resource and Settlement Interval. The output = 1, if and only if the Bid price for the indicated Bid segment is missing, and = 0, if the Bid segment price is not missing. |
|  | FMMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif | A flag indicator (Boolean – 0/1) that denotes a missing Energy Bid segment price for Energy dispatched in FMM for a given resource and Settlement Interval. The output = 1, if and only if the Bid price for the indicated Bid segment is missing, and = 0, if the Bid segment price is not missing.The output stores the view results presented by view FMMEnergyMissingBidPriceFlag during the configuration calculation. As the output is transient in nature, it is not published in XML-based settlement statement files, but is captured during the calculation and transferred to charge type output FMMEnergyMissingBidPriceFlagBrtuT’I’M’F’S’md. |
|  | BADispatchIntervalResourceRTMMLC BrtuT’I’M’F’S’mdhcif | RTM MLC (in $) that is BCR-eligible for a given resource and Settlement Interval |
|  | BASettlementIntervalResourceFinalBidEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for RTD Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations of a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in RTD by multiplying the energy of the Final Energy Bid with its corresponding Final Energy Bid price. |
|  | RTMEstablishedEnergyBidPrice BrtuT’bI’Q’M’VL’W’R’F’S’mdhcif | Energy Bid Price (in $/MWh) associated with a resource, Energy Bid segment and Settlement Interval for Energy dispatched by the RTD process of the real-time market. The Bid price represents 1. the Bid price as submitted by the Business Associate for the dispatched Energy in the real-time market, and thereafter possibly modified by the MPM process,
2. or, in the case where a Bid price was not submitted for the dispatched Energy, a Bid price established based on (1) the arithmetic polarity (+/-/0) of the RTD-dispatched Optimal Instructed Imbalance Energy and RTM MLC for the resource and Settlement Interval and (2) whether or not the resource is associated with a net-settled MSS entity.
 |
|  | RTMEnergyMissingBidPriceFlag BrtuT’bI’M’VL’W’R’F’S’mdhcif | A flag indicator (Boolean – 0/1) that denotes a missing Energy Bid segment price for Energy dispatched by the 5-minute RTD process of the real-time market for a given resource and Settlement Interval. The output = 1, if and only if the Bid price for the indicated Bid segment is missing, and = 0, if the Bid segment price is not missing. |
|  | RTMEnergyMissingBidPriceFlag\_V BrtuT’bI’M’VL’W’R’F’S’mdhcif | A flag indicator (Boolean – 0/1) that denotes a missing Energy Bid segment price for Energy dispatched by the 5-minute RTD process of the real-time market for a given resource and Settlement Interval. The output = 1, if and only if the Bid price for the indicated Bid segment is missing, and = 0, if the Bid segment price is not missing.The output stores the view results presented by view RTMEnergyMissingBidPriceFlag during the configuration calculation. As the output is transient in nature, it is not published in XML-based settlement statement files, but is captured during the calculation and transferred to charge type output RTMEnergyMissingBidPriceFlagBrtuT’I’M’F’S’md. |
|  | BASettlementIntervalResourceMSSFinalBidEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for MSS-provided Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated by multiplication of the energy with the Final Bid price. |
|  | SettlementIntervalLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated by multiplication of the energy with the LMP. |
|  | BASettlementIntervalResourceUDCLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for UDC-provided Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated as the sum of the associated Energy cost for UDC-provided RTD Optimal Energy and FMM Optimal Energy. |
|  | BASettlementIntervalResourceLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for UDC-provided RTD Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in RTD by (a) multiplying the Bid energy with the RTD LMP for cases where the RTD Energy Bid price is not missing or the RTM MLC >= 0 or the associated RTD Optimal Energy > 0; (b) for all other cases (not covered in a) assigning 0 as the value for the energy cost. |
|  | BASettlementIntervalResourceLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for UDC-provided FMM Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in FMM by (a) multiplying the Bid energy with the FMM LMP for cases where the FMM Energy Bid price is not missing or the RTM MLC >= 0 or the associated FMM Optimal Energy > 0; (b) for all other cases (not covered in a) assigning 0 as the value for the energy cost. |
|  | BASettlementIntervalResourceMSSLMPEligibleRTMOptimalIIEBidCost BrtuT’I’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for MSS-provided Optimal Energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated as the sum of the associated Energy cost for MSS-provided RTD Optimal Energy and FMM Optimal Energy. Optimal Energy that overlaps with Load Following Energy is not eligible for Bid Cost Recovery and is not represented by the output. |
|  | BASettlementIntervalResourceMSSNetLMPEligibleRTMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for net-settled MSS-provided RTM Optimal Energy that is eligible for inclusion within the BCR Bid Cost calculations for a given resource and Settlement Interval, and that is calculated for each given RTM bid segment dispatched in RTM as the sum of the eligible LMP-RTD Optimal Energy Revenue and the eligible FMM Optimal Energy Revenue for the resource and Settlement Interval. |
|  | BASettlementIntervalResourceMSSNetLMPEligibleRTDOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for RTD Optimal Energy from a net-settled MSS for energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated as (a) the RTD Optimal Revenue Amount for each energy bid segment for cases where the RTD Energy Bid price is not missing or the RTM MLC >= 0 or the associated RTD Optimal Energy > 0; (b) the value zero (0) for all other cases (not covered in a). |
|  | BASettlementIntervalResourceMSSNetLMPEligibleFMMOptimalIIEBidCost BrtuT’bI’M’VL’W’R’F’S’mdhcif | Energy cost (in $) for FMM Optimal Energy from a net-settled MSS for energy that is eligible for inclusion within the BCR Market Revenue and Bid Cost calculations for a given resource and Settlement Interval, and that is calculated as (a) the FMM Optimal Revenue Amount for each energy bid segment for cases where the FMM Energy Bid price is not missing or the RTM MLC >= 0 or the associated FMM Optimal Energy > 0; (b) the value zero (0) for all other cases (not covered in a). |
|  | SettlementIntervalEligibleRTIIEMinimumLoadEnergyFlag BrtuT’I’M’VL’W’R’F’S’mdhcif | A flag output (as a Booean value – 0/1) that indicates whether or not RTM MLE (in MWh) from a given resource that CAISO committed for RUC or RTM is eligible for inclusion within Market Revenue calculations for the resource and the specified Settlement Interval.1 => Eligible; 0 => Ineligible  |
|  | RTMMSSNetBCRAmount BT’I’M’mdhcif | The net difference (in $) of RTM Energy Bid Costs, RTM AS Costs, RTM Market Revenue, and RTM AS Revenue for a MSS entity with net Settlement election and for a given Settlement Interval. This quantity can be positive or negative or zero representing a shortfall or surplus respectively. |
|  | BAARTMMSSNetBCRAmount BT’I’Q’M’mdhcif | RTMMSSNetBCRAmount associated to its BAA. |
|  | RTMMSSNetASAmount BT’I’M’mdhcif | The net (in $) of RTM Ancillary Service Bid Costs and Ancillary Service Revenues for a given Settlement Interval and MSS entity with net Settlement election. |
|  | RTMMSSNetEnergyBidCostAmount BT’I’M’mdhcif | The net (in $) of RTM Energy Bid Costs and Energy Market Revenues for a given Settlement Interval and MSS entity with net Settlement election. |
|  | RTMMSSEnergyRevenue BrtuT’I’M’F’S’mdhcif | RTM Energy Revenue Amount (in $) including RTMOptimalIIE Revenue, Minimum Load Energy Revenue and Pumping Energy Revenue for a given Settlement Interval and MSS entity with net Settlement election. |
|  | BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmount BrtT’uI’M’F’S’mdhcif | RTM Energy Revenue Amount (in $) including RTMOptimalIIE Revenue, Minimum Load Energy Revenue and Pumping Energy Revenue for a given Settlement Interval and MSS entity with net Settlement election. |
|  | BASettlementIntervalResourceMSSNetRTMEnergyRevenueAmountWithoutPM BrtT’uI’M’VL’W’R’F’S’mdhcif | RTM Energy Revenue Amount (in $) prior to any application of the Real-time Performance Metric. The amount includes RTMOptimalIIE Revenue, Minimum Load Energy Revenue and Pumping Energy Revenue for a given Settlement Interval and MSS entity with net Settlement election. |
|  | BASettlementIntervalResourceMSSNetRTMIIEMinimumLoadEnergyRevenue BrtT’uI’M’VL’W’R’F’S’mdhcif | RTM Minimum Load Energy Revenue Amount (in $) for a a given Settlement Interval and resource of a net-settled MSS entity. |
|  | BASettlementIntervalResourceMSSNetFMMIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif | FMM Minimum Load Energy Revenue Amount (in $) for a a given Settlement Interval and resource of a net-settled MSS entity. |
|  | BASettlementIntervalResourceMSSNetRTDIIEMinimumLoadEnergyRevenue BrtuT’I’M’VL’W’R’F’S’mdhcif | RTD Minimum Load Energy Revenue Amount (in $) for a a given Settlement Interval and resource of a net-settled MSS entity. |
|  | BASettlementIntervalResourceMSSNetRTMOptimalIIERevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTM Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given Settlement Interval and resource of a net-settled MSS entity. |
|  | BASettlementIntervalResourceMSSNetFMMOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif | The FMM Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given Settlement Interval and bid segment of a net-settled MSS resource. |
|  | BASettlementIntervalResourceMSSNetRTDOptimalIIERevenueAmount BrtT’ubI’M’VL’W’R’F’S’mdhcif | The RTD Optimal Instructed Imbalance Energy Revenue Amount (in $) for a given Settlement Interval and bid segment of a net-settled MSS resource. |
|  | BASettlementIntervalResourceMSSNetRTMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTM Pumping Energy Revenue Amount (in $) for a given Settlement Interval and Pumped-Storage Hydro Unit of a net-settled MSS entity.  |
|  | BASettlementIntervalResourceMSSNetFMMPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The FMM Pumping Energy Revenue Amount (in $) for a given Settlement Interval and Pumped-Storage Hydro Unit of a net-settled MSS entity.  |
|  | BASettlementIntervalResourceMSSNetRTDPumpingEnergyRevenueAmount BrtT’uI’M’VL’W’R’F’S’mdhcif | The RTD Pumping Energy Revenue Amount (in $) for a given Settlement Interval and Pumped-Storage Hydro Unit of a net-settled MSS entity.  |
|  | RTMMSSNetRegMileageBidCostAmount BT’I’M’mdhcif | For a net-settled MSS entity and given Settlement Interval the output reflects the RTM Regulation Mileage Bid Cost amount minus the RTM Regulation Mileage Revenue amount (in $).  |
|  | RTMASNetBidCost BrtuT’I’M’F’S’mdhcif | RTM Ancillary Service Bid Costs less No Pay (in $) for a given resource and Settlement Interval. |
|  | RTMASNetRevenue BrtuT’I’M’F’S’mdhcif | RTM Ancillary Service Revenues less No Pay (in $) for a given resource and Settlement Interval. |
|  | RTMASBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | The bid costs (in $) for all RTM-awarded AS in RT for a given resource and Settlement Interval.  |
|  | ASNoPayQtyBidCost BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | The No Pay amount (in $) for all applicable Ancillary Services based upon No Pay quantity and average Bid Price for a given resource and Settlement Interval i. |
|  | RTMASRevenueAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | Revenue amount (in $) for all RTM-awarded AS in RT for a given resource and Settlement Interval.  |
|  | ASNoPayAmount BrtuT’I’Q’M’VL’W’R’F’S’mdhcif | The No Pay amount (in $) for all applicable Ancillary Services based upon No Pay quantity and average No Pay Price for a given resource and Settlement Interval i.  |
|  | RTMRegMileageBidCostAmount BrtuT’I’M’F’S’mdhcif | RTM Regulation Mileage Bid Cost amount (in $) for a given resource and Settlement Interval.  |
|  | RTMRegUpMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif | RTM Regulation Up Mileage Bid Cost amount (in $) for a given resource and Settlement Interval. |
|  | BA15MinResourceRTMRegUpMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Up Mileage self-provided Bid Cost amount (in $) for a given resource and FMM Interval. |
|  | BA15MinResourceAdditionalRTMRegUpQSPCapacity BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Up AS qualified self-provided capacity (in MW) for a given resource and FMM Interval. |
|  | BA15MinResourceRTMRegUpMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Up Mileage awarded Bid Cost amount (in $) for a given resource and FMM Interval. |
|  | BA15MinResourceRTMRegUpAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Up awarded Bid capacity (in MW) for a given resource and FMM Interval. |
|  | RTMRegDownMileageBidCostAmount BrtuT’I’Q’M’F’S’mdhcif | RTM Regulation Down Mileage Bid Cost amount (in $) for a given resource and Settlement Interval. |
|  | BA15MinResourceRTMRegDownMileageSelfProvidedBidCostAmount BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Down Mileage self-provided Bid Cost amount (in $) for a given resource and FMM Interval. |
|  | BA15MinResourceAdditionalRTMRegDownQSPCapacity BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Down AS qualified self-provided capacity (in MW) for a given resource and FMM Interval. |
|  | BA15MinResourceRTMRegDownMileageAwardedBidCostAmount BrtuT’I’Q’M’F’S’mdhc | Regulation Down mileage awarded Bid Cost amount (in $) for a given resource and FMM Interval. |
|  | BA15MinResourceRTMRegDownAwardedBidCapacity BrtuT’I’Q’M’F’S’mdhc | RTM Regulation Down AS awarded bid capacity (in MW) for a given resource and FMM Interval. |
|  | RTMRegMileageRevenueAmount BrtuT’I’M’F’S’mdhcif | RTM Regulation Mileage revenue amount (in $) for a given resource and Settlement Interval.  |
|  | RTMRegUpMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif | RTM Regulation Up Mileage revenue amount (in $) for a given resource and Settlement Interval.  |
|  | RTMRegDownMileageRevenueAmount BrtuT’I’Q’M’F’S’mdhcif | RTM Regulation Down Mileage revenue amount (in $) $) for a given resource and Settlement Interval.  |
|  | DayResourceNonBCRGeneratorBidOptionFlag rmd | A flag (as a Boolean 0/1 value) that, when = 1, indicates that for a given resource and specified Trading Hour the resource has submitted a 60 minute bid dispatchable option of Economic bid hourly block. This output will be calculated and published on daily settlement statements. |
|  | BABCRIneligibleFlag rmdhcif | A flag (as a Boolean 0/1 value) that, when = 1, indicates that for a given resource and specified Trading Hour the resource is ineligible for BCR. |
|  | NonMSSRMRRTMNetCostAmount Brmdhcif | RMR RTM net cost (revenues minus costs) for a non-MSS net resource per settlement intervalNote: This intermediate calculation will not be reportable. |
|  | MSSNetRMRRTMNetCostAmount Brmdhcif | RMR RTM net cost (revenues minus costs) for an MSS net resource per settlement intervalNote: This intermediate calculation will not be reportable. |
|  | RMRDayRTMNetCostAmount rmd | RMR net cost (revenues minus costs) per Trading Day. RTM and RUC revenues and costs are considered together in the calculation for the combined RUC and RTM excess revenues.Note: This intermediate calculation will not be reportable. |
|  | RMRDayRTMExcessRevAmount rmd | RMR net cost (revenues minus costs) per Trading Day. Captures any excess revenues compared to costs, when this value is positive.Note: This will be reportable. |
|  | NonMSSRMRRUCNetCostAmount Brmdhcif | RMR RUC net cost (revenues minus costs) for a non-MSS net resource per settlement intervalNote: This intermediate calculation will not be reportable. |
|  | MSSNetRMRRUCNetCostAmount Brmdhcif | RMR RUC net cost (revenues minus costs) for an MSS net resource per settlement intervalNote: This intermediate calculation will not be reportable. |
|  | ResourceHourlyEndofHourSOCFlag rmdh | A flag with a value of 1 if a resource has submitted an End of Hour State of Charge to be considered in RTM BCR calculation, otherwise 0. |
|  | ResourceHourlyRTMSelfScheduleFlag rmdh | A flag with a value of 1 if a resource has submitted a Real Time Market Self Schedule to be considered in RTM BCR calculation, otherwise 0. |
|  | RTMNetLESREligibilityAmount rmdhcif | An intermediate amount used in LESR NREM RTM BCR calculation per settlement interval. |
|  | ResourceHourlyEOHSelfBCRFlag rmdhicf | A flag that is 1 to be considered in RTM BCR calculation, or 0 if not. |
|  | RTMMSSNetLESRAmount BruT’I’M’F’mdhcif | An intermediate charge type to sum costs and revenues to use in BCR calculation. |
|  | Resource5minutelyRTMASSOCFlag rmdhcif | A flag that is 1 to be considered in RTM BCR calculation, or 0 if not. |

# Charge Code Effective Dates

| Charge Code/Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| Pre-Calc RTM Net Amount | 5.8 | 04/01/09 | 01/31/10 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.9 | 02/01/10 | 11/30/12 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.10 | 12/01/12 | 01/31/13 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.11 | 02/01/13 | 05/31/13 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.12 | 06/01/13 | 02/28/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.21 | 03/01/14 | 04/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.27 | 05/01/14 | 09/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.28 | 10/01/14 | 06/30/15 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.29 | 07/01/15 | 11/03/15 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.30 | 11/04/15 | 10/31/16 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.31 | 11/01/16 | 3/31/18 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.32 | 4/1/18 | 11/12/19 | Documentation Edits and Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.33 | 11/13/19 | 12/31/19 | Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.34 | 1/1/20 | 12/31/19 | Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.35 | 10/1/20 | 12/31/19 | Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.34.1 | 1/1/20 | 9/30/20 | Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.35.1 | 10/1/20 | 10/31/21 | Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.36 | 11/1/21 | 9/19/22 | Documentation & Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.37 | 9/20/22 | 6/30/23 | Documentation & Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.37.1 | 7/1/23 | 10/31/23 | Documentation & Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.38 | 11/1/23 | 10/31/23 | Documentation & Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.38.1 | 11/1/23 | 4/30/26 | Documentation & Configuration Impacted |
| Pre-Calc RTM Net Amount | 5.39 | 5/1/26 | Open | Documentation & Configuration Impacted |