**Settlements and Billing**

Configuration Guide: Start-Up and Mininum Load Cost

**Pre-calculation**

Version 5.23.0a

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# Purpose of Document

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

# Introduction

## Background

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

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

SUC, MLC and TC for each market and resource are determined in Pre-calculation Start-Up and Minimum Load Cost. The commitment costs together with the energy and AS bid costs are then used as inputs to calculate a resource’s net difference between costs and revenues in separate Pre-calculations by market --- IFM Net Amount, RUC Net Amount, and RTM Net Amount. If the difference between the total costs and the market revenues is positive in the relevant market, then the net amount represents a Shortfall. If the difference is negative in the relevant market, the net amount represents a Surplus. For each resource or, in the case of a MSS entity that has elected net settlement, all MSS resources collectively, the IFM, RUC, and RTM Shortfalls and Surpluses are then netted over all hours of a Trading Day, with the IFM Shortfalls and Surpluses netted separately from the RUC and RTM Shortfalls and Surpluses. Thus, RUC or RTM surpluses over the entire Trading Day are used to offset a RTM or RUC shortfall, respectively, incurred over the entire Trading Day. For either IFM or the combined RUC and RTM netting, if the net amount over the Trading Day is positive (a Shortfall), then the resource or net-settled MSS entity receives a BCR Uplift Payment equal to the net Trading Day amount under CC 6620 – RUC and RTM Bid Cost Recovery Settlement (for a combined RUC and RTM shortfall), or CC 6630 IFM Bid Cost Recovery Settlement (for an IFM shortfall).

This Pre-calculation calculates the eligible Start-Up Costs, Minimum Load Costs and MSG Resource Transition Costs for IFM, RUC, and RTM for Bid Cost Recovery.

## Description

For CAISO-committed resources in each Settlement Interval the Start-Up and Minimum Load Cost Pre-calculation configuration will determine the eligible Start-Up Costs, Minimum Load Costs, and MSG Resource Transition Costs for IFM, RUC, and RTM for Bid Cost Recovery purposes. The configuration will perform the calculations necessary to implement the business rules identified in the Business Rules section below.

# Charge Code Requirements

## Business Rules

| Bus Req. ID | Business Rule |
| --- | --- |
|  | This pre-calc is a daily computation generating results on a Settlement Interval basis. |
|  | RUC commitment costs refers to the start-up, minimum load, transition cost for ISO committed RCU and RCD awards. |
|  | This precalculation also applies to BCR eligible resources of an EDAM Entity. |
|  | The IFM Start-Up Cost for any IFM Commitment Period shall equal to the Start-Up Costs submitted by the Scheduling Coordinator to the CAISO for the IFM divided by the number of Settlement Intervals within the applicable IFM Commitment Period. |
|  | For each Settlement Interval, only the IFM Start-Up Cost in a CAISO IFM Commitment Period is eligible for Bid Cost Recovery. |
|  | The CAISO will determine the IFM Start-Up Costs for Multi-Stage Generating Resources based on the CAISO-committed MSG Configuration. |
|  | The following rules shall apply sequentially to qualify the IFM Start-Up Cost in an IFM Commitment Period: |
|  | 1. The IFM Start-Up Cost for an IFM Commitment Period shall be zero if there is an IFM Self-Commitment Period within or overlapping with that IFM Commitment Period. |
|  | 1. The IFM Start-Up Cost for an IFM Commitment Period shall be zero if the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule in the Day-Ahead Market anywhere within the applicable IFM Commitment Period. |
|  | 1. The IFM Start-Up Cost for an IFM Commitment Period shall be zero if there is no actual Start-Up at the start of the applicable IFM Commitment Period because the IFM Commitment Period is the continuation of an IFM, RUC, or RTM Commitment Period from the previous Trading Day. |
|  | 1. If an IFM Start-Up is terminated in the Real-Time within the applicable IFM Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource was starting up, the IFM Start-Up Cost for that IFM Commitment Period shall be prorated by the ratio of the Start-Up Time before termination over the total IFM Start-Up Time. |
|  | 1. The IFM Start-Up Cost is qualified if an actual Start-Up occurs within the applicable IFM Commitment Period. |
|  | An actual Start-Up is detected when the relevant metered Energy in the applicable Settlement Intervals indicates the unit is Off before the time the resource is instructed to be On as specified in its Start-Up Instruction and is On in the Settlement Intervals that fall within the CAISO IFM Commitment Period. |
|  | The CAISO will determine whether the resource is On for this purpose based on whether the resource’s metered Energy is at or above the resource’s Minimum Load as registered in the Master File, or, if applicable, as adjusted for temporarily increased Minimum Load. |
|  | 1. The IFM Start-Up Cost will be qualified if an actual Start-Up occurs earlier than the start of the IFM Commitment Period, if the advance Start-Up is as a result of a Start-Up instruction issued in a RUC or Real-Time Market process subsequent to the IFM, or the advance Start-Up is uninstructed but is still within the same Trading Day and the Bid Cost Recovery Eligible Resource actually stays on until the targeted IFM Start-Up. |
|  | For an eventual CAISO IFM Commitment, a Short Start Unit will not be subject to the check that the unit is Off first before the time the resource is instructed to be On validation check, as long as the resource was started up within the same Trading Day as the CAISO IFM Commitment Period. |
|  | 1. The Start- Up Costs for a Bid Cost Recovery Eligible Resource that is a Short Start Unit committed by the CAISO in the IFM and that further receives a Start-Up Instruction from the CAISO in the Real-Time Market to start within the same CAISO IFM Commitment Period, will be qualified for the CAISO IFM Commitment Period instead of being qualified for the CAISO RTM Commitment Period; |
|  | The Start-Up Costs of any subsequent RTM Start-Ups that fall within the IFM Commitment Period will be qualified as RTM Start-Up Costs. |
|  | The Minimum Load Cost for the applicable Settlement Interval shall be the Minimum Load Cost submitted to the CAISO in the IFM divided by the number of Settlement Intervals in a Trading Hour, subject to the rules described below. |
|  | 1. For each Settlement Interval, only the IFM Minimum Load Cost in a CAISO IFM Commitment Period is eligible for Bid Cost Recovery. |
|  | 1. The IFM Minimum Load Cost for any Settlement Interval is zero if:    1. the Settlement Interval is in an IFM Self Commitment Period for the Bid Cost Recovery Eligible Resource; or    2. the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule for the applicable Settlement Interval. |
|  | 1. If a Bid Cost Recovery Eligible Resource is committed by the CAISO in the Day-Ahead and receives a Day-Ahead Schedule and subsequently is decommitted by the CAISO in the Real-Time Market, the IFM Minimum Load Costs are subject to the Real-Time Performance Metric. |
|  | 1. If a Multi-Stage Generating Resource is committed by the CAISO and receives a Day-Ahead Schedule and subsequently is committed by the CAISO to a lower MSG Configuration where its Minimum Load capacity as registered in the Master File in the Real-Time Market is lower than the CAISO IFM Commitment Period MSG Configuration’s Minimum Load as registered in the Master File, the the resource’s IFM Minimum Load Costs are subject to the Real-Time Performance Metric. |
|  | If the conditions in (c) or (d) apply, the CAISO will adjust the IFM Minimum Load Costs, IFM Energy Bid Costs and IFM 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 IFM Pumping Bid Costs in the same manner in which the CAISO applies the Real-time Performance Metric to the IFM 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 IFM Energy Bid Cost plus the IFM Minimum Load Cost and the IFM Market Revenues are greater than or equal to zero (0), the CAISO will apply the Real-Time Performance Metric instead of Day-Ahead Energy Adjustment Factor to the IFM Minimum Load Costs and IFM Energy Bid Costs, and not the IFM Market Revenues. |
|  | If the IFM Energy Bid Costs plus the IFM Minimum Load Cost are greater than or equal to zero (0) and the IFM Market Revenues are negative, the ISO will apply the Real-Time Performance Metric instead of the Day-ahead Metered Energy Adjustment Factor to the IFM Minimum Load Costs and IFM Energy Bid Costs, and the IFM Market Revenues. |
|  | If the IFM Energy Bid Costs plus the IFM Minimum Load Costs and the IFM Market Revenues are negative, the CAISO will apply the Real-Time Performance Metric instead of the Day-Ahead Metered Energy Adjustment Factor to the IFM Market Revenues but not the IFM Minimum Load Costs and IFM Energy Bid Costs. |
|  | If the IFM Energy Bid Costs plus the IFM Minimum Load Costs and the IFM Market Revenues are negative, the CAISO will apply the Real-Time Performance Metric instead of the Day-Ahead Metered Energy Adjustment Factor to the IFM Market Revenues but not the IFM Minimum Load Costs and IFM Energy Bid Costs. |
|  | 1. If the conditions in (c) or (d) do not apply, then the IFM Minimum Load Cost for any Settlement Interval is zero if the Bid Cost Recovery Eligible Resource is determined to be Off during the applicable Settlement Interval. |
|  | For the purposes of determining IFM Minimum Load Cost, a Bid Cost Recovery Eligible Resource is assumed to be On if |
|  | * 1. its metered Energy in a Settlement Interval is equal to or greater than the difference between its (a) Minimum Load as registered in the Master File, or if applicable, as adjusted for temporarily increased Minimum Load and (b) the Tolerance Band, and |
|  | * 1. the Metered Energy is greater than zero (0) MWh. |
|  | Otherwise, such resource is determined to be Off. |
|  | 1. For Multi-Stage Generating Resources, the commitment period is determined based on application of Tariff section 11.8.1.3. |
|  | In the event a Multi-Stage Generating Resource receives differing market commitments, the latest market commitment for a MSG resource will be presumed to be in the precedence order of RTM followed by RUC followed by IFM, with a RTM commitment taking precedence over a RUC and IFM commitment, and a RUC commitment taking precedence over an IFM commitment. |
|  | If the commitment period is IFM, then the calculation of the IFM Minimum Load Costs will depend on whether the IFM CAISO Committed MSG Configuration is On. |
|  | For the purposes of determining IFM Minimum Load Cost for a Multi-Stage Generating Resource, a Bid Cost Recovery Eligible Resource is assumed to be On if its metered Energy in a Settlement Interval is equal to or greater than the difference between its IFM MSG Configuration Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – and the Tolerance Band, and the Metered Energy is greater than zero (0) MWh. |
|  | Otherwise, such resource is determined to be Off. |
|  | If the IFM CAISO Committed MSG Configuration is determined to be On, then the IFM Minimum Load Costs will be based on the Minimum Load Costs of the IFM committed MSG Configuration. |
|  | 1. The IFM Minimum Load Costs calculation will be subject to the Shut-Down State Variable and the resource will be disqualified from BCR based on the variable's value. |
|  | For Pumped-Storage Hydro Units and Participating Load only, the IFM Pump Shut-Down Costs for each Settlement Interval shall be equal to the relevant Pump Shut-Down Cost submitted to CAISO in the IFM divided by the number of Settlement Intervals in a Trading Hour that is preceded by a previous commitment by the IFM to pump, in which actual shut down occurs if the unit is committed by the IFM not to pump and actually does not operate in pumping mode in that Settlement Interval (as detected through Meter Data). |
|  | The IFM Pump Shut-Down Cost for an IFM Shut-Down period shall be zero if: |
|  | 1. it is followed by an IFM or RTM Self-Commitment Period in generation mode; |
|  | 1. the Shut-Down is due to an Outage reported through SLIC; or |
|  | 1. the Shut-Down is delayed by the RTM past the IFM Shut-Down period in question or cancelled by the RTM before the Shut-Down process has started. |
|  | For Pumped-Storage Hydro Units and Participating Load only, the IFM Pumping Bid Cost for the applicable Settlement Interval shall be the (hourly) Pumping Cost submitted to the CAISO in the IFM divided by the number of Settlement Intervals in a Trading Hour. |
|  | The Pumping Cost is negative. |
|  | The Pumping Cost is included in IFM Bid Cost computation for a Pumped-Storage Hydro Unit and Participating Load committed by the IFM to pump or serve Load if it actually operates in pumping mode or serves Load in that Settlement Interval. |
|  | The IFM Energy Bid Cost for a Participating Load for any Settlement Interval is set to zero for actual Energy consumed in excess of the Day-Ahead Schedule for Demand. |
|  | The IFM Pumping Cost for any Settlement Interval is zero if: |
|  | 1. the Settlement Interval is in an IFM Self-Commitment Period for the Bid Cost Recovery Eligible Resource; or |
|  | 1. the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule for the applicable Settlement Interval. |
|  | For each Settlement Interval, the IFM Transition Costs shall be based on the MSG Configuration to which the Multi-Stage Generating Resource is transitioning and is allocated to the CAISO Commitment Period of that MSG Configuration. |
|  | Within any eligible IFM CAISO Commitment Period the CAISO shall apply the IFM Transition Costs for the Settlement Intervals in which the Multi-Stage Generating Resource is actually transitioning from the “from” MSG Configuration and reaches the Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – of the “to” MSG Configuration to which the Multi-Stage Generating Resource is transitioning, subject to the Tolerance Band. |
|  | The RUC Start-Up Cost for any Settlement Interval in a RUC Commitment Period shall consist of Start-Up Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the applicable RUC Commitment Period divided by the number of Settlement Intervals in the applicable RUC Commitment Period. |
|  | For each Settlement Interval, only the RUC Start-Up Cost in a CAISO RUC Commitment Period is eligible for Bid Cost Recovery. |
|  | The CAISO will determine the RUC Start-Up Cost for a Multi-Stage Generating Resource based on the MSG Configuration committed by the CAISO in RUC. |
|  | The following rules shall be applied in sequence and shall qualify the RUC Start-Up Cost in a RUC Commitment Period: |
|  | * 1. The RUC Start-Up Cost for a RUC Commitment Period is zero if there is an IFM Commitment Period within that RUC Commitment Period. |
|  | * 1. The RUC Start-Up Cost for a RUC Commitment Period is zero if the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract prior to the Day-Ahead Market or is flagged as an RMR Dispatch in the Day-Ahead Schedule anywhere within that RUC Commitment Period. |
|  | * 1. he RUC Start-Up Cost for a RUC Commitment Period is zero if there is no RUC Start-Up at the start of that RUC Commitment Period because the RUC Commitment Period is the continuation of an IFM, RUC, or RTM Commitment Period from the previous Trading Day. |
|  | * 1. The RUC Start-Up Cost for a RUC Commitment Period is zero if the Start-Up is delayed beyond the RUC Commitment Period in question or cancelled by the Real-Time Market prior to the Bid Cost Recovery Eligible Resource starting its start-up process. |
|  | * 1. If a RUC Start-Up is terminated in the Real-Time within the applicable RUC Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource is starting up, the RUC Start-Up Cost is prorated by the ratio of the Start-Up Time before termination over the RUC Start-Up Time. |
|  | * 1. The RUC Start-Up Cost for a RUC Commitment Period is qualified if an actual Start-Up occurs within that RUC Commitment Period. |
|  | An actual Start-Up is detected when the relevant metered Energy in the applicable Settlement Intervals indicates that the resource is Off before the time the resource is instructed to be On as specified in its Start Up Instruction and is On in the Settlement Intervals that fall within the CAISO RUC Commitment Period. |
|  | The CAISO will determine whether the resource is On for this purpose based on whether its metered Energy is at or above the resource’s Minimum Load as registered in the Master File, or, if applicable, as adjusted for temporarily increased Minimum Load. |
|  | The CAISO will determine the Minimum Load Energy for Multi-Stage Generating Resources based on the CAISO-committed MSG Configuration. |
|  | * 1. The RUC Start-Up Cost shall be qualified if an actual Start-Up occurs. |
|  | An actual Start-Up is detected when the relevant metered Energy in the applicable Settlement Intervals indicates the unit is Off before the time the resource is instructed to be On as specified in its Start Up Instruction and is On in the Settlement Intervals that fall within the CAISO RUC Commitment Period. |
|  | The Minimum Load Cost for the applicable Settlement Interval shall be the Minimum Load Cost of the Bid Cost Recovery Eligible Resource divided by the number of Settlement Intervals in a Trading Hour. |
|  | For each Settlement Interval, only the RUC Minimum Load Cost in a CAISO RUC Commitment Period is eligible for Bid Cost Recovery. |
|  | The RUC Minimum Load Cost for any Settlement Interval is zero if: |
|  | 1. the Bid Cost Recovery Eligible Resource is manually pre-dispatched under an RMR Contract or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule in that Settlement Interval; |
|  | 1. the Bid Cost Recovery Eligible Resource is not committed or Dispatched in the Real-time Market in the applicable Settlement Interval; or |
|  | 1. the applicable Settlement Interval is included in an IFM Commitment Period. |
|  | For Multi-Stage Generating Resources, the commitment period is determined based on application of Tariff section 11.8.1.3. |
|  | In the event a Multi-Stage Generating Resource receives differing market commitments, the latest market commitment for a MSG resource will be presumed to be in the precedence order of RTM followed by RUC followed by IFM, with a RTM commitment taking precedence over a RUC and IFM commitment, and a RUC commitment taking precedence over an IFM commitment. |
|  | For the purposes of determining RUC Minimum Load Cost, a Bid Cost Recovery Eligible Resource’s recovery of the RUC Minimum Load Costs is subject to the Real-time Performance Metric. |
|  | The RUC Minimum Load calculation and the qualification of a resource for Bid Cost Recovery shall be subject to the Shut-Down State Variable. |
|  | For each Settlement Interval, the RUC Transition Costs shall be based on the MSG Configuration to which the Multi-Stage Generating Resource is transitioning and is allocated to the CAISO commitment period of that MSG Configuration. |
|  | Within any eligible RUC CAISO Commitment Period, the CAISO shall apply the RUC Transition Costs for the Settlement Intervals in which the Multi-Stage Generating Resource is actually transitioning from the “from” MSG Configuration and reaches the Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – of the “to” MSG Configuration to which the Multi-Stage Generating Resource is transitioning, subject to the Tolerance Band. |
|  | For each Settlement Interval of the applicable Real-Time Market Commitment Period, the Real-Time Market Start-Up Cost shall consist of the Start-Up Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the Real-Time Market divided by the number of Settlement Intervals in the applicable Real-Time Market Commitment Period. |
|  | For each Settlement Interval, only the Real-Time Market Start-Up Cost in a CAISO Real-Time Market Commitment Period is eligible for Bid Cost Recovery. |
|  | The CAISO will determine the RTM Start-Up Cost for a Multi-Stage Generating Resource based on the MSG Configuration committed by the CAISO in RTM. |
|  | The following rules shall be applied in sequence and shall qualify the Real-Time Market Start-Up Cost in a Real-Time Market Commitment Period: |
|  | 1. The Real-Time Market Start-Up Cost is zero if there is a Real-Time Market Self-Commitment Period within the Real-Time Market Commitment Period. |
|  | 1. The Real-Time Market Start-Up Cost is zero if the Bid Cost Recovery Eligible Resource has been manually pre-dispatched under an RMR Contract or the resource is flagged as an RMR Dispatch in the Day-Ahead Schedule or Real-Time Market anywhere within that Real-Time Market Commitment Period. |
|  | 1. The Real-Time Market Start-Up Cost is zero if the Bid Cost Recovery Eligible Resource is started within the Real-Time Market Commitment Period pursuant to an Exceptional Dispatch issued to    1. perform Ancillary Services testing;    2. perform pre-commercial operation testing for Generating Units; or    3. perform PMax testing. |
|  | 1. The Real-Time Market Start-Up Cost is zero if there is no Real-Time Market Start-Up at the start of that Real-Time Market Commitment Period because the Real-Time Market Commitment Period is the continuation of an IFM or RUC Commitment Period from the previous Trading Day. |
|  | 1. If a Real-Time Market Start-Up is terminated in the Real-Time within the applicable Real-Time Market Commitment Period through an Exceptional Dispatch Shut-Down Instruction issued while the Bid Cost Recovery Eligible Resource is starting up, the Real-Time Market Start-Up Cost is prorated by the ratio of the Start-Up Time before termination over the Real-Time Market Start-Up Time. |
|  | 1. The Real-Time Market Start-Up Cost shall be qualified if an actual Start-Up occurs within that Real-Time Market Commitment Period. |
|  | An actual Start-Up is detected when the relevant metered Energy in the applicable Settlement Interval(s) indicates the unit is Off before the time the resource is instructed to be On as specified in its Start Up Instruction and is On in a Settlement Interval that falls within the CAISO Real-Time Market Commitment Period. |
|  | The CAISO will determine whether the resource is On for this purpose based on whether its metered Energy is at or above the resource’s Minimum Load as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load . |
|  | For a Multi-Stage Generating Resource the CAISO will determine that the resource is On based on the MSG Configuration to which the CAISO has committed the resource in the Real-Time Market. |
|  | 1. The Real-Time Market Start-Up Cost for a Real-Time Market Commitment Period shall be qualified if an actual Start-Up occurs earlier than the start of the Real-Time Market Start-Up, if the relevant Start-Up is still within the same Trading Day and the Bid Cost Recovery Eligible Resource actually stays on until the Real-Time Market Start-Up; otherwise the Start-Up Cost is zero for the Real-Time Market Commitment Period. |
|  | 1. For Short Start Units, the BCR Eligible Resource’s IFM Start-Up Cost will be qualified for the IFM Commitment Period instead of qualified for the RTM Commitment Period, when the Short Start Unit is started up in the Real-time Market after the start of and before the end of the IFM Commitment Period. |
|  | For subsequent Start-Ups of Short-Start Units after the CAISO Shuts Down a resource and then the CAISO issues a Start-Up Instruction pursuant to a CAISO RTM Commitment within the CAISO IFM Commitment Period, the Start-Up Costs shall be qualified as Real-Time Start-Up costs, provided that the resource actually Shut-Down and Started-Up based on CAISO Start-Up or Shut-Down Instructions. |
|  | The RTM Minimum Load Cost is the Minimum Load Cost of the Bid Cost Recovery Eligible Resource submitted to the CAISO for the Real-Time Market, as adjusted for temporarily increased Minimum Load, if applicable, divided by the number of Settlement Intervals in a Trading Hour. |
|  | For each Settlement Interval, only the RTM Minimum Load Cost in a CAISO RTM Commitment Period is eligible for Bid Cost Recovery. |
|  | The RTM Minimum Load Cost for any Settlement Interval is zero if: |
|  | * 1. the Settlement Interval is included in a RTM Self-Commitment Period for the Bid Cost Recovery Eligible Resource; |
|  | * 1. the Bid Cost Recovery Eligible Resource has been manually dispatched under an RMR Contract or the resource has been flagged as an RMR Dispatch in the Day-Ahead Schedule or the Real-Time Market in that Settlement Interval; |
|  | * 1. for all resources that are not Multi-Stage Generating Resources, that Settlement Interval is included in an IFM or RUC Commitment Period; |
|  | * 1. the Bid Cost Recovery Eligible Resource is committed for the purpose of performing Ancillary Services testing, pre-commercial operation testing for Generating Units, or PMax testing. |
|  | A resource’s RTM Minimum Load Costs for Bid Cost Recovery purposes are subject to the application of the Real-Time Performance Metric. |
|  | For Multi-Stage Generating Resources, the commitment period is further determined based on application of Tariff section 11.8.1.3. |
|  | In the event a Multi-Stage Generating Resource receives differing market commitments, the latest market commitment for a MSG resource will be presumed to be in the precedence order of RTM followed by RUC followed by IFM, with a RTM commitment taking precedence over a RUC and IFM commitment, and a RUC commitment taking precedence over an IFM commitment. |
|  | For all Bid Cost Recovery Eligible Resources that the CAISO Shuts Down, either through an Exceptional Dispatch or an Economic Dispatch through the Real-Time Market, from its Day-Ahead Schedule that was also from an ISO commitment, the RTM Minimum Load Costs will include negative Minimum Load Costs for Energy between the Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – and zero (0) MWhs. |
|  | For all Multi-Stage Generating Resources that the CAISO commits down to a lower MSG Configuration with its Minimum Load capacity lower than the Day-Ahead CAISO Committed MSG Configuration’s Minimum Load capacity, either through an Exceptional Dispatch or an Economic Dispatch through the Real-Time Market, from its IFM MSG Configuration that was also from a CAISO Commitment Period, the Minimum Load Costs will be equal to the RTM Minimum Load Cost less the IFM or RUC Minimum Load Cost, as applicable. |
|  | The CAISO will adjust the RTM Energy Bid Cost, the RTM Market Revenues, and the RUC and RTM Minimum Load Costs 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, the CAISO will apply the Real-Time Performance Metric to RTM Energy Bids Costs and 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 Cost are greater than or equal to zero 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 Cost are negative and RTM Market Revenues are greater than or equal to zero, 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, RUC and RTM Minimum Load Cost, or RTM Market Revenue. |
|  | The RTM Pump Shut-Down Cost for each Settlement Interval is the relevant Pump Shut-Down Cost submitted by the Scheduling Coordinator only for Pumped-Storage Hydro Units and Participating Load, divided by the number of Settlement Intervals in which such resource was committed by the Real-Time Market in a Trading Hour with scheduled pumping operation and in which an actual Shut-Down occurs and the resource does not actually operate in pumping mode or serve Load in that Settlement Interval (as detected through Meter Data). |
|  | The RTM Pump Shut-Down Cost for a Real-Time Market Shut-Down event shall be zero if:   * + 1. it is followed by a RTM Self-Commitment Period in generation mode or offline mode; or     2. the Shut-Down is due to an Outage reported through SLIC. |
|  | For Pumped-Storage Hydro Units and Participating Load only, the RTM Pumping Bid Cost for the applicable Settlement Interval shall be the Pumping Cost submitted to the CAISO in the RTM divided by the number of Settlement Intervals in a Trading Hour. |
|  | The Pumping Cost is negative since it represents the amount the entity is willing to pay to pump or serve Load. |
|  | The Pumping Cost is included in RTM Bid Cost computation for a Pumped-Storage Hydro Unit and Participating Load committed by the Real-Time Market to pump or serve Load, if it actually operates in pumping mode or serves Load in that Settlement Interval. |
|  | The RTM Energy Bid Cost for a Participating Load for any Settlement Interval is set to zero for any Energy consumed in excess of instructed Energy. |
|  | The RTM Pumping Bid Cost for any Settlement Interval is zero if: |
|  | 1. the Settlement Interval is included in a RTM Self-Commitment Period for the Bid Cost Recovery Eligible Resource; |
|  | 1. the Bid Cost Recovery Eligible Resource has been manually dispatched under an RMR Contract or the resource has been flagged as an RMR Dispatch in the Day- Ahead Schedule or the Real-Time Market in that Settlement Interval; |
|  | 1. the Bid Cost Recovery Eligible Resource is not actually in pumping mode in that Settlement Interval; |
|  | 1. that Settlement Interval is included in an IFM or RUC Commitment Period; or |
|  | 1. the Bid Cost Recovery Eligible Resource is committed for the purpose of performing Ancillary Services testing or pre-commercial operation testing. |
|  | For each Settlement Interval, the RTM Transition Cost shall be based on the MSG Configuration to which the Multi-Stage Generating Resource is transitioning and are allocated to the CAISO commitment period of that MSG Configuration. |
|  | Within any eligible RTM CAISO Commitment Period, the CAISO shall apply the RTM Transition Costs for the Settlement Intervals in which the Multi-Stage Generating Resource is actually transitioning from the “from” MSG Configuration and reaches the Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – of the “to” MSG Configuration to which the Multi-Stage Generating Resource is transitioning, subject to the Tolerance Band. |
|  | From the Dispatch Interval in which the CAISO has determined that the Dispatch Operating Point minus the Shut-Down State Variable is less than or equal to the Minimum Load – as registered in the Master File or, if applicable, as adjusted for temporarily increased Minimum Load – and until the Shut-Down State Variable is reset, the IFM, RUC or RTM Minimum Load Costs, as applicable, will be disqualified from the Bid Cost Recovery calculation. |
|  | In the event that the CAISO issues a binding Shut-Down Instruction through ADS, a resource will not be eligible for recovery of RTM or RUC Minimum Load Costs from the point of the Shut-Down Instruction forward for the duration of the resource’s registered Minimum Down Time. |
|  | If a resource ignores the binding Shut-Down Instruction and it has a Day-ahead Schedule, the resource is not eligible for IFM Minimum Load Cost recovery for the minimum of   * + - 1. the resource’s Minimum Down Time, and       2. the IFM Commitment Period. |
|  | For any resource that receives a Shut-Down Instruction in the Real-time Market, any IFM or RTM Energy Bid Cost recovery that may otherwise apply pursuant to other Bid Cost recovery rules will be based on the relevant Energy Bid price, as mitigated, that was considered by the Real-Time Market in shutting the resource down for the length of time defined by the greater of (a) the resource’s Minimum Down Time or (b) the period in which it is Off after the Shut-Down time, which is not to exceed the time until the end of the Trading Day. |
|  | The Shut-Down State Variable shall track the positive Uninstructed Imbalance Energy once an advisory Shut-Down Instruction is issued to a resource. |
|  | The Shut-Down State Variable shall provide the MWh cumulative over the Real-Time Unit Commitment Intervals had the resource followed the Shut-Down Instruction. |
|  | The Shut-Down State Variable shall begin to accumulate the positive Uninstructed Imbalance Energy MWh as soon as the advisory schedule includes a zero MW Dispatch within the Real-Time Market dispatch horizon and continues to accumulate the positive Uninstructed Imbalance Energy as long as   1. the unit is online, and 2. the Metered Energy less Regulation Energy less the Expected Energy is greater than the Performance Tolerance Band. |
|  | The Shut-Down State Variable shall be reset to zero when the most recent Real-time Unit Commitment run no longer has a zero MW Dispatch within the Real-Time Dispatch horizon or the resource is Off. |
|  | The Tolerance Band shall be expressed in terms of Energy (MWh) for Generating Units, System Units and imports from Dynamic System Resources for each Settlement Interval and equals the greater of the absolute value of:   1. five (5) MW divided by the number of Settlement Intervals per Settlement Period or 2. three (3) percent of the relevant Generating Unit’s, Dynamic System Resource’s or System Unit’s maximum output (PMax), as registered in the Master File, divided by the number of Settlement Intervals per Settlement Period. |
|  | Where used in the assessment of MLC, SUC, and Transition Cost, the resource’s Pmin should reflect any Pmin rerates as used in real-time market through the lower operating limit data. |
|  | For RMR resources subject to new Tariff, their opportunity cost and major maintenance adders shall reduce commitment costs. These will include start-up, minimum load, and transition costs adjustments under IFM, RUC, and RTM markets. The adjustment is per commitment period and can cover more than one market if such markets are under the same commitment period. |
|  | All joint-owned unit (JOU) Child Resources will be subject to Settlement in accordance with the CAISO Tariff provisions applicable to EIM Participating Resources and EIM non-participating resources. The JOU Parent Resource will not be subject to any Settlement, nor will there be any administrative fees or charges applicable to the JOU Parent Resource with respect to the implementation and operation of the unique Scheduling Coordinator ID code associated with the JOU Parent Resource. |
|  | For a JOU child resource, the commitment cost qualifications – particularly for Real-Time Start Up Cost, and for Real-Time Minimum Load Cost qualification - will be performed for the JOU parent by comparing the submitted Meter Data and effective Pmin (and any lower operating limit) of the JOU Parent resource. All JOU child resources of the JOU Parent Resource will receive the outcome of these commitment cost qualifications process. |
|  | For calculating the Persistent Deviation Metric and Real-Time Performance Metric, there will be a ramp rate calculated for the JOU Child Resources in the following manner:  the delta of the DOTs from consecutive Settlement Intervals divided the time difference between those Settlement Intervals. |
|  | To promote feasible dispatches, ISO can adjust a Discrete RDRR (Reliability Demand Response Resource) real-time minimum load cost to be nonzero. This is a feature included with the RDRR Bidding Enhancements initiative. |
|  | PTB logic does not apply to the Pre-calculation Start-Up and Minimum Load Cost configuration. |

## Predecessor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calc – Metered Energy Adjustment Factor |
| Pre-calc – MSS Netting |
| Pre-calc – Real Time Energy Quantity |
| Pre-calc – System Resource Deemed Delivered Energy |

## Successor Charge Codes

| Charge Code/ Pre-calc Name |
| --- |
| Pre-calc – Metered Energy Adjustment Factor |
| Pre-calc – IFM Net Amount |
| Pre-calc – RUC Net Amount |
| Pre-calc – RTM Net Amount |

## Inputs – External Systems

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| Row # | Variable Name | Description |
| --- | --- | --- |
|  | IFMMLC BrtuT’I’M’F’S’Ymdhcif | The qualified IFM Minimum Load Costs (in $) for a given resource and Settlement Interval. For a MSG Resource, the IFM Minimum Load Costs are associated with the Configuration ID. For a non-MSG Resource, the costs are simply associated with the resource. |
|  | BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not IFM Minimum Load Costs (in $) for a given resource and Dispatch Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource.  The input shall be active (= 1) for each Settlement Interval of an IFM Commitment Period, excluding any Settlement Interval that is part of a resource’s Minimum Down Time period in the case where the resource received a DA Energy award in IFM for the Settlement Interval, and then, in the real-time market received a shutdown instruction through ADS and did not comply with the instruction (as evidenced by the resource’s meter value being nonzero) during the Settlement Interval. |
|  | BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not an advisory shutdown instruction applies to the given resource and Dispatch Interval.  The advisory shutdown flag has a value of 1 for a resource, whenever there exists at least one advisory instruction to shutdown in the RTUC run horizon’s advisory timeframe. An RTUC run’s horizon consists of two parts: (a) the first 15-minutes as the energy binding interval, and (b) the remaining time intervals, about an hour and fifteen minutes are referred to as advisory timeframe. The time to shutdown, which is advisory only, may be within or outside afterwards of the RTUC horizon.  The subject dispatch interval defined by this variable is part of the energy binding interval of the RTUC run’s horizon.  When there is no advisory shutdown instruction that satisfies above conditions, this variable has a flag value of 0 or is not created at all. |
|  | BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not IFM Start-Up Costs for a given resource and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RUC Start-Up Costs for a given resource and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RTM Start-Up Costs for a given resource and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | BASettlementIntervalJOUParentChildRTMSUCFlag Brtj’’uT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RTM Start-Up Costs for a given JOU parent j’’ associated with resource r and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | RUCMLC BrtuT’I’M’F’S’Yhcif | The qualified RUC Minimum Load Costs (in $) for a given resource and Settlement Interval.  For a MSG Resource, the RUC Minimum Load Costs are associated with the Configuration ID. For a non-MSG Resource, the costs are simply associated with the resource. |
|  | BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RUC Minimum Load Costs for a given resource and Dispatch Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource.  The input shall be active (= 1) for each Settlement Interval of a RUC Commitment Period, excluding any Settlement Interval that is part of a resource’s Minimum Down Time period in the case where the resource received a RUC award for the Settlement Interval, and then, in the real-time market received a shutdown instruction through ADS and did not comply with the instruction (as evidenced by the resource’s meter value being nonzero) during the Settlement Interval. |
|  | 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 (Boolean – 0/1) that indicates whether or not RTM Minimum Load Costs for a given resource and Dispatch Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource.  The input shall be active (= 1) for each Settlement Interval of a RTM Commitment Period, as well as for any Settlement Interval within the resource’s Minimum Down Time period following an ADS shutdown instruction for the case where   1. the resource received a DA Energy award in IFM for the Settlement Interval, and then, in the real-time market received a shutdown instruction through ADS and complied with the instruction (as reflected by the resource’s meter value equalling 0 for the Settlement Interval). 2. the resource received a RUC award, and then, in the real-time market received a shutdown instruction through ADS and complied with the instruction (as reflected by the resource’s meter value equaling 0 for the Settlement Interval). |
|  | BADispatchIntervalJOUParentChildRTMMLCostEligibleFlag Brtj’’uT’I’M’F’S’Ymdhcif | Applicable to JOU child resources r only.  Similar to the variable, BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif, with the addition of the JOU parent attribute j’’ included as an attribute. Attribute Y (Config ID is NULL) for any JOU resource. |
|  | IFMSUC BrtuT’I’M’F’S’mdhcif | The qualified IFM Start-Up Costs (in $) for a given resource and Settlement Interval. |
|  | RUCSUC BrtuT’I’M’F’S’mdhcif | The qualified RUC Start-Up Costs (in $) for a given resource and Settlement Interval. |
|  | RTMSUC BrtuT’I’M’F’S’mdhcif | The qualified RTM Start-Up Costs (in $) for a given resource and Settlement Interval. |
|  | IFMTC BrtuT’I’M’F’S’mdhcif | For Multi-Stage Generating Units (MSG) only, the qualified IFM Transition Costs (in $) for a given Settlement Interval. |
|  | RUCTC BrtuT’I’M’F’S’mdhcif | For MSG only, the qualified RUC Transition Costs for a given Settlement Interval. |
|  | RTMTC BrtuT’I’M’F’S’mdhcif | For MSG only, the qualified RTM Transition Costs (in $) for a given Settlement Interval. |
|  | IFMPumpingCost BrtuT’I’M’F’S’mdhcif | The IFM Pumping Costs for a given pump resource and Settlement Interval. |
|  | IFMPumpingCostFlag BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not IFM Pumping Costs are qualified for cost compensation for a given resource and Settlement Interval.  Qualified = 1, Not qualified = 0. |
|  | RTMPumpingCost BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not the RTM Pumping Costs (in $) for a given pump resource and Settlement Interval. |
|  | RTMPumpingCostFlag BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not RTM Pumping Costs are qualified for cost compensation for a given resource and Settlement Interval.  Qualified = 1, Not qualified = 0. |
|  | IFMSDC BrtuT’I’M’F’S’mdhcif | The qualified IFM Shut-Down Costs (in $) for a given pump resource and Settlement Interval. |
|  | RTMSDC BrtuT’I’M’F’S’mdhcif | The qualified RTM Shut-Down Costs (in $) for a given pump resource and Settlement Interval. |
|  | BADailyResourceIFMCommitOverlapRTMFlag BrtuT’I’M’O’O’’F’S’md | A flag (Boolean – 0/1) that indicates whether or not a RTM commitment period overlaps with a IFM commitment period for which the RTM commitment period starts at the same time as or later than the start of the IFM commitment period. The input = 1 to indicate a RTM commitment period overlap with the IFM commitment period and is otherwise blank (NULL). |
|  | ExceptionalDispatchShutdownFlag BrtF’S’mdhcif | A flag input (Boolean – 0/1) that indicates when an Exceptional Dispatch Shut-Down Instruction was issued by CAISO in Real Time for a given resource within the CAISO Control Area and for the Settlement Interval in which the pro-rated Start-Up costs are qualified for cost compensation as indicated by BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif, BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif, and BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif.  Shut-Down Instruction in RT was issued = 1;  Shut-Down Instruction in RT did not occur = 0, or flag value does not exist (is NULL). |
|  | BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif | A flag (Boolean – 0/1) that denotes a start-up notification period. The input is used in the Settlements calculations in tandem with the BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif, BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif or BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif SUC flag input that is defined for a particular commitment period. The input’s value will = 1 for each Settlement Interval of the start-up notification period and will otherwise be blank (NULL).  The same O’ value of the SUC flag input associated with the start-up notification period flag input shall apply to the O’ value of the Start-up Notification Period input. |
|  | BASettlementIntervalJOUParentChildStartUpNotificationPeriodFlag Brtj’’uT’I’M’O’F’S’XYmdhcif | Only for JOU resources based on the variable, BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif, with the JOU parent association included for each JOU child resource. |
|  | GeneratorToleranceBandMW | Tolerance Band expressed in terms of MW capacity for Bid Cost Recovery Eligible Resources (such as Generating Units, System Units and Dynamic System Resources)  This input should be obtained from Standing Data. The initially stored input value shall = 5 MW. |
|  | MaxOperMW BrtF’S’md | Maximum Operating MW limit (in MW) for a given resource, as registered in Master File. |
|  | JOUParentMaxOperMW j’’md | JOU Parent Maximum Operating MW limit (in MW), as registered in Master File. |
|  | GeneratorToleranceBandPercent | Value (unit-less) used to establish the Tolerance Band’s minimum limit , expressed in terms of percent of Maximum Operating Limit for Bid Cost Recovery Eligible Resources (such as Generating Units, System Units and Dynamic System Resources)  The input’s value is obtained from Settlements-related Standing Data. The initially stored input value shall = 3 %. |
|  | IFMSDCFlag BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not IFM Shut-Down Costs for a given pump resource and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | RTMSDCFlag BrtuT’I’M’F’S’mdhcif | A flag (Boolean – 0/1) that indicates whether or not RTM Shut-Down Costs for a given pump resource and Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. |
|  | IFMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not IFM Transition Costs for a given MSG resource and Settlement Interval are qualified for cost compensation. The input is defined only for a MSG resource.  Qualified = 1, Not qualified = 0. |
|  | RUCTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RUC Transition Costs for a given MSG resource and Settlement Interval are qualified for cost compensation. The input is defined only for a MSG resource.  Qualified = 1, Not qualified = 0. |
|  | RTMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif | A flag (Boolean – 0/1) that indicates whether or not RTM Transition Costs for a given MSG resource and Settlement Interval are qualified for cost compensation. The input is defined only for a MSG resource. .  Qualified = 1, Not qualified = 0. |
|  | BADailyResourceConfigID\_PMinOperMW BrtF’S’Ymd | Minimum Operating MW limit (PMin) of a MSG Resource Configuration, as registered in Master File (in MW) for a given resource and, for a MSG resource, a MSG Configuration. The Minimum Operating MW limit is as registered in Master File for the relevant Resource ID and MSG Configuration ID. The input is presented to determine   1. the PMin value that corresponds to all Transition Notification Period and Transition Period Settlement Intervals related to a MSG Resource transition between a “From” and “To” MSG Configuration. There will be a separate input value for the two “From” and “To” MSG configurations (as specified by the Y attribute value); 2. the PMin value for which MLC inputs BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif, BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif, and BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif are provided 3. the start-up PMin value (on which start-up cost is based) for a commitment period interval designated by SUC flag inputs BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif, BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif, and BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif   The input represents the resource-level PMin value for a non-MSG resource. |
| 1. Jou | JOUParentPMinOperMW j’’md | Minimum Operating MW limit (PMin) of a JOU Parent resource j’’ as registered in Master File (in MW) and is associated with a JOU child resource r. |
|  | BA5mRTMResourceConfigID\_LowerOperLimit BrtF’S’Ymdhcif | RTM Lower Operating Limit (in MW) of a MSG Resource Configuration, as registered Pmin in Master File or as updated through a Pmin rerate if applicable, for a given resource and, for a MSG resource, an MSG Configuration. The input is presented to determine   1. the RTM PMin value that corresponds to all Transition Notification Period and Transition Period Settlement Intervals related to a MSG Resource transition between a “From” and “To” MSG Configuration. There will be a separate input value for the two “From” and “To” MSG configurations (as specified by the Y attribute value); 2. the RTM PMin value for which MLC input BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif ,BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif ,BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif are provided 3. the RTM start-up PMin value (on which start-up cost is based) for a commitment period interval designated by SUC flag inputs BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif. BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif. and BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif.   The input represents the resource-level PMin (or re-rated Pmin) value for a non-MSG resource as was used for the RTM market. |
|  | JOUParent5mRTMLowerOperLimit j’’mdchif | The input represents the resource-level PMin (or re-rated Pmin) value for a JOU Parent as was used for the RTM market.  Will be applicable to all commitment cost eligibility for a JOU child resource that is associated with the JOU parent. |
|  | BADailyResourceConfigID\_TCPMaxOperMW BrtF’S’Ymd | Maximum Operating MW limit (PMax) of a MSG Resource Configuration, as registered in Master File (in MW), for a specified resource. The Maximum Operating MW limit is as registered in Master File for the relevant Resource ID and MSG Configuration ID. The input is presented for all Transition Notification Period and Transition Period Settlement Intervals related to a MSG Resource transition between a “From” and “To” MSG Configuration. There will be a separate input value for the two “From” and “To” MSG configurations (as specified by the Y attribute value).  The input is not defined for a non-MSG resource. |
|  | BASettlementIntervalResourceMSGTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif | A flag (Boolean – 0/1) that identifies a transition notification period for a MSG resource. The input is received by Settlements in tandem with the IFMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif, RUCTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif or RTMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif TC flag input that is defined for a particular transition period. The input’s value will = 1 for each Settlement Interval of the transition notification period. The input will be exclusively defined for the Settlement Intervals that belong to the input’s associated transition notification period (i.e., will be undefined for other Settlement Intervals).  The same O’ value of the TC configuration flag input that accompanies the notification period flag input shall also apply to the O’ value of the Transition Notification Period input. |
|  | BADispatchIntervalADSShutdownMDTFlag Brtmdhcif | A flag (Boolean – 1 or NULL) that indicates a resource’s Minimum Down Time (MDT) after the resource receives a shutdown instruction through the Automated Dispatch System (ADS) subsystem. The flag equals 1 from the start of the Settlement Interval in which ADS issues the shutdown instruction until the completion of the Settlement Interval in which the Minimum Down Time expires. For all other Settlement Intervals (outside the MDT period) the input is NULL (missing). |
|  | DailyResourceShortStartFlag rmd | A flag (Boolean – 1 or NULL) that indicates a resource’s is a Short Start Unit based on Tariff definition. Currently, Tariff defines it as:  “A Generating Unit that has a cycle time less than or equal to 255 minutes (Start-Up Time plus Minimum Up Time is less than or equal to 255 minutes), and can be fully optimized with respect to this cycle time.”  In addition:  • For non-MSG resources, use the longest start up time registered in the MF (aka cold start).  • For MSG resources, use the longest start up time registered for the plant (not configuration level) in the MF.  • For MSG resources, use the minimum up time, MUT registered for the plant (not configuration level) in the MF.This variable is only created where there is a startup cost for the Trading Day for the short start unit. |
|  | BADailyRMRResFlag BrtuT’I’M’O’F’S’Y’’Ymd | Identifies a resource is an RMR subject to new Tariff and RAAIM assessment. |
|  | RMR\_MSGResFlag rmd | RMR resource which is also a Multi-Stage Generator. |
|  | RMR\_NonMSGResFlag rmd | RMR resource which is not a Multi-Stage Generator. |
|  | SUC\_OCAdderAmt BrtYmd | Opportunity cost adder per startup for the day. Currently, applicable for RMR resources only. |
|  | MLC\_OCAdderAmt BrtYmd | Opportunity cost adder for minimum load cost. This is a daily value applicable per run-hour of the day. Currently, relevant for RMR resources only. |
|  | TC\_OCAdderAmt BrtY”Ymd | Opportunity cost adder per transition from “From” configuration (Y”) to “To” configuration (Y) for the day. Currently, relevant for RMR resources only. |
|  | SUC\_MMAdderAmt BrtYmd | Major maintenance adder per startup for the day. Currently, relevant for RMR resources only. |
|  | MLC\_MMAdderAmt BrtYmd | Major maintenance adder for minimum load cost. This is a daily value applicable per run-hour of the day. Currently, relevant for RMR resources only. |
|  | TC\_MMAdderAmt BrtY”Ymd | Major maintenance cost adder per transition from “From” configuration (Y”) to “To” configuration (Y) for the day. Currently, relevant for RMR resources only. |
|  | JOUResourceAssociationFlag Brtj’’uT’I’M’F’S’md | A (0/1) flag that when it has a value of 1 identifies a resource r is a JOU child resource. The resource r is linked to its JOU parent attribute j’’ and well as other attributes. |
|  | JOUParentGenMeterValue j’’mdhcif | Meter data value for a physical resource JOU parent j’’ ID. |

## Inputs – Predecessor Charge Codes or Pre-calculations

| Input Req. ID | Variable Name | Predecessor Charge Code/  Pre-calc Configuration |
| --- | --- | --- |
|  | TotalExpectedEnergyFiltered BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | BASettlementIntervalResourceMeteredGenerationVariation BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | BASettlementIntervalResourcePMToleranceBand BrtuT’I’M’F’S’mdhcif | Pre-calc – Metered Energy Adjustment Factor |
|  | BASettlementIntervalResEntityEIMAreaMeteredGenerationQuantity BrtuT’I’Q’M’AA’F’R’pPW’QS’d’Nz’VvHn’L’mdhcif | Pre-calc – MSS Netting |
|  | BAResEntitySettlementIntervalMeteredCAISODemandQuantity BrtT’Q’uI’M’AA’R’pW’QF’S’d’n’Nz’HvPVL’mdhcif | Pre-calc – MSS Netting |
|  | SettlementIntervalRealTimeUIE BrtuT’I’Q’M’F’S’mdhcif | Pre-calc Real Time Energy Quantity |
|  | SettlementIntervalDeemedDeliveredInterchangeEnergyQuantity BrtEuT’I’Q’M’AA’F’R’pPW’QS’d’Nz’OvvHn’L’mdhcif | Pre-calc – System Resource Deemed Delivered Energy |

## CAISO Formula

**IFM, RUC, RTM Minimum Load Costs**

AvailableIFMMLCBrtuT’I’M’F’S’mdhcif =

Max(0,(IFMMLCBrtuT’I’M’F’S’Ymdhcif  - RMRMLCAdj BrtYmdhcif)) \* BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif \* (1 – BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif)

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

IF JOUChildResourceFlag rmd = 1

THEN

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

JOUChildSettlementIntervalAdvisoryShutdownUIEFlag rmdhcif

ELSE

(

IF ( BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif > 0 AND

(BASettlementIntervalResourceExpectedEnergyUIEDifference BrtuT’I’M’F’S’mdhcif <= BASettlementIntervalResourceCumulativeUIEPMinTestLimit BrtuT’I’M’F’S’mdhcif

))

THEN

BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif = BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif

ELSE

BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif = 0

END IF

)

END IF

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

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

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

MLC\_PMinOperMWhQuantity BrtF’S’mdhcif

Where Exists

BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif

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

IF

BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif > 0

THEN

BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif = BASettlementIntervalResourceCumulativeUIE\_V BrtuT’I’M’F’S’mdhcif

ELSE

BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif = 0

END IF

BASettlementIntervalResourceCumulativeUIE\_V BrtuT’I’M’F’S’mdhcif =

BASettlementIntervalResourceCumulativeUIE\_View BrtuT’I’M’F’S’mdhcif

Where Exists

BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif

**Notes:**

1. BASettlementIntervalResourceCumulativeUIE\_View BrtuT’I’M’F’S’mdhcif stores the cumulative UIE output returned from the custom function @UIEINTERVALCUMVAL (A, B, C). The function’s input parameters are identified as follows:
   1. A = BADailyResourceEndOfPriorDayCumulativeUIE BrtuT’I’M’F’S’md
   2. B = SettlementIntervalPositiveRealTimeUIEBrtuT’I’M’F’S’mdhcif
   3. C = BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif
2. Variable BASettlementIntervalResourceCumulativeUIE\_View BrtuT’I’M’F’S’mdhcif is not reportable in XML-based settlement statement files.

BADailyResourceEndOfPriorDayCumulativeUIE BrtuT’I’M’F’S’md =

BADailyResourceEndOfPriorDayCumulativeUIE\_V BrtuT’I’M’F’S’md

BADailyResourceEndOfPriorDayCumulativeUIE\_V BrtuT’I’M’F’S’md =

BADailyResourceEndOfPriorDayCumulativeUIE\_View BrtuT’I’M’F’S’md

Where Exists

BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif

**Notes:**

1. Variable BADailyResourceEndOfPriorDayCumulativeUIE\_View BrtuT’I’M’F’S’md is the output of view View\_ BADailyResourceEndOfPriorDayCumulativeUIE (that is run during the configuration’s execution). The view provides the output of variable BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif for the last Settlement Interval of the adjoining prior Trading Day.
2. View\_ BADailyResourceEndOfPriorDayCumulativeUIE will return a value if and only if input BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif = 1 for the first Settlement Interval of Trading Hour 1.
3. Variable BADailyResourceEndOfPriorDayCumulativeUIE\_V BrtuT’I’M’F’S’md is not reportable in XML-based settlement statement files.

SettlementIntervalPositiveRealTimeUIEBrtuT’I’M’F’S’mdhcif =

IF

BASettlementIntervalResourceMeteredGenerationVariation BrtuT’I’M’F’S’mdhcif > BASettlementIntervalResourcePMToleranceBand BrtuT’I’M’F’S’mdhcif

THEN

SettlementIntervalPositiveRealTimeUIEBrtuT’I’M’F’S’mdhcif = Max(0, SettlementIntervalRealTimeUIE BrtuT’I’Q’M’F’S’mdhcif )

ELSE

SettlementIntervalPositiveRealTimeUIEBrtuT’I’M’F’S’mdhcif = 0

END IF

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

BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif \* MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif

AvailableRUCMLCBrtuT’I’M’F’S’mdhcif =

Max(0, (RUCMLC BrtuT’I’M’F’S’Yhcif - RMRMLCAdj BrtYmdhcif)) \* BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif \* (1 – BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif)

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

(RTMMLC BrtuT’I’M’F’S’Ymdhcif – RTM\_RMRMLCAdj BrtYmdhcif) \* BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif \* (1 – BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif)

MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif=

IF JOUChildResourceFlag rmd = 1

THEN

MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif = JOUChildMLC\_PMinRealTimeOnFlag rmdhcif

ELSE

{

IF

MLC\_PMinRealTimeOnFlagCount BrtF’S’mdhcif> 0

And

GenMeterValue BrtF’S’mdhcif > 0

And

GenMeterValue BrtF’S’mdhcif ≥

MLC\_PMinLessToleranceBandQuantity BrtF’S’mdhcif

THEN

MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif= 1

ELSE

MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif = 0

END IF

}

END IF

MLC\_PMinRealTimeOnFlagCount BrtF’S’mdhcif =

(BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif +

BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif +

BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif)

Where GenMeterValue BrtF’S’mdhcif =

BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif

Where Exists

BASettlementIntervalResourceIFMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif, BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif, BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif, IFMSUC BrtuT’I’M’F’S’mdhcif , RUCSUC BrtuT’I’M’F’S’mdhcif , RTMSUC BrtuT’I’M’F’S’mdhcif , IFMTC BrtuT’I’M’F’S’mdhcif, RUCTC BrtuT’I’M’F’S’mdhcif, or RTMTC BrtuT’I’M’F’S’mdhcif

Where BASettlementIntervalResourceIFMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif =

 BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif

Where BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif =

 BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif

Where BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif =

 BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif

Where BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif=



(BASettlementIntervalResEntityEIMAreaMeteredGenerationQuantity BrtuT’I’Q’M’AA’F’R’pPW’QS’d’Nz’VvHn’L’mdhcif +

SettlementIntervalDeemedDeliveredInterchangeEnergyQuantity BrtEuT’I’Q’M’AA’F’R’pPW’QS’d’Nz’OvVHn’L’mdhcif )

MLC\_PMinLessToleranceBandQuantity BrtF’S’mdhcif =

max(0, MLC\_PMinOperMWhQuantity BrtF’S’mdhcif- ToleranceBand BrtF’S’mdhcif )

MLC\_PMinOperMWhQuantity BrtF’S’mdhcif =

IF

BASettlementIntervalResourceLatestInstructedMarketCodeFactor BrtF’S’mdhcif >= 4

THEN

MLC\_PMinOperMWhQuantity BrtF’S’mdhcif = (1/12) \* RTMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif

ELSE IF

BASettlementIntervalResourceLatestInstructedMarketCodeFactor BrtF’S’mdhcif >= 2

THEN

MLC\_PMinOperMWhQuantity BrtF’S’mdhcif = (1/12) \* RUCMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif

ELSE

MLC\_PMinOperMWhQuantity BrtF’S’mdhcif = (1/12) \* IFMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif

END IF

Where Exists

BASettlementIntervalResourceLatestInstructedMarketCodeFactor BrtF’S’mdhcif

BASettlementIntervalResourceLatestInstructedMarketCodeFactor BrtF’S’mdhcif =

(4\* BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif + 2\* BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif + BASettlementIntervalResourceIFMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif)

Where Exists

BASettlementIntervalResourceIFMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif,    
BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif, and BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif

IFMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif =

(RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif \* BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif =

Max(INTDUPLICATE(BADailyResourceConfigID\_PMinOperMW BrtF’S’Ymd), BA5mRTMResourceConfigID\_LowerOperLimit BrtF’S’Ymdhcif )

RUCMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif =

(RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif \* BADispatchIntervalResourceMSGConfigIDRUCMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

RTMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif =

( RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif \* BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

IFMMLC\_PMinOperMW BrtF’S’mdhcif =

( INTDUPLICATE(BADailyResourceConfigID\_PMinOperMW BrtF’S’Ymd ) \* BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

RTMMLC\_PMinOperMW BrtF’S’mdhcif =

( INTDUPLICATE(BADailyResourceConfigID\_PMinOperMW BrtF’S’Ymd ) \* BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif )

**IFM / RTM Pump Costs Recovery**

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

(-1) \* IFMPumpingCost BrtuT’I’M’F’S’mdhcif \* IFMPumpingCostFlag BrtuT’I’M’F’S’mdhcif

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

(-1) \* RTMPumpingCost BrtuT’I’M’F’S’mdhcif\* RTMPumpingCostFlag BrtuT’I’M’F’S’mdhcif

And BAResEntitySettlementIntervalMeteredCAISODemandQuantity\_BCRPC BrtF’S’mdhcif =

BAResEntitySettlementIntervalMeteredCAISODemandQuantity BrtT’Q’uI’M’AA’R’pW’QF’S’d’n’Nz’HvPVL’mdhcif

Where

Entity Component Type F’ = PMPP, PMPST

**IFM Start-Up Costs / Shut-Down Costs**

EligibleIFMSUC BrtuT’I’M’F’S’mdhcif =

(BASettlementIntervalResourceCommitNonOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif + (1 – BADailyResourcePriorDayOKToPaySUCFlag BrtuT’I’M’O’F’S’md ) \* BASettlementIntervalResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif )

BASettlementIntervalResourceCommitNonOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif =

( (1 – BADailyResourceIFMCommitOverlapFlag BrtuT’I’M’O’F’S’md) \* ( IFMSUC BrtuT’I’M’F’S’mdhcif - RMR\_SUCAdj BrtO’mdhcif)\* EligibleIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif \* BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md ) )

BASettlementIntervalResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif =

 (BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif \* BADailyResourceCommitOverlapEligibleIFMSUCIntervalRate BrtuT’I’M’O’F’S’md )

BADailyResourceCommitOverlapEligibleIFMSUCIntervalRate BrtuT’I’M’O’F’S’md =

BADailyResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’md / BADailyResourceIFMCommitOverlapPeriodSettlementIntervalCount BrtuT’I’M’O’F’S’md

Where Exists

BADailyResourceIFMCommitOverlapFlag BrtuT’I’M’O’F’S’md

BADailyResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’md =

ATTRIBUTE SWAP (O’, O’’) On BADailyResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’md

BADailyResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’md =

BASettlementIntervalResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’mdhcif

BASettlementIntervalResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’mdhcif =

BADailyResourceIFMCommitOverlapRTMFlag BrtuT’I’M’O’O’’F’S’md \* BASettlementIntervalResourceCommitEligibleRTMSUC BrtuT’I’M’O’F’S’mdhcif

BADailyResourceIFMCommitOverlapPeriodIntervalCount BrtuT’I’M’O’F’S’md =

(BADailyResourceIFMCommitOverlapFlag BrtuT’I’M’O’F’S’md \* BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif )

BADailyResourceIFMCommitOverlapFlag BrtuT’I’M’O’F’S’md =

 ATTRIBUTE SWAP (O’, O’’) On BADailyResourceIFMCommitOverlapRTMFlag BrtuT’I’M’O’O’’F’S’md

EligibleIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif =

(OnForIFMPeriodSUCFlag BrtuT’I’M’O’F’S’md\* BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif)

OnForIFMPeriodSUCFlag BrtuT’I’M’O’F’S’md=

INTMAX(OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif )

**Note:**

The INTMAX function ensures that the maximum value of input OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif over all Settlement Intervals of the Trading Day is used in lieu of the 5-minute input in the above calculation that occurs at the daily level.

And OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif =

IF

ExceptionalDispatchShutdownFlag BrtF’S’mdhcif<> 1

THEN

OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif = (BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif\* ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif )

ELSE

OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif = BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif

END IF

ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif =

IF

(

BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif = 1

And

GenMeterValue BrtF’S’mdhcif > 0

And

GenMeterValue BrtF’S’mdhcif ≥ ( IFMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif / 12 )   
)

THEN

ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 1

ELSE

ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 0

END IF

IFMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif =

BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif \* RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif

BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md =

BADailyResourceOffForStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’md \* OnForCommitmentPeriodSUCFlag BrtuT’I’M’O’F’S’md \* (1 – BADailyResourcePriorDayOKToPaySUCFlag BrtuT’I’M’O’F’S’md)

BADailyResourcePriorDayOKToPaySUCFlag BrtuT’I’M’O’F’S’md =

BADailyResourcePriorDayOKToPaySUCFlag\_V BrtuT’I’M’O’F’S’md

BADailyResourcePriorDayOKToPaySUCFlag\_V BrtuT’I’M’O’F’S’md =

View\_BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md-1

Where

d-1 represents the prior Trading Day

**Notes:**

1. Variable BADailyResourcePriorDayOKToPaySUCFlag\_V BrtuT’I’M’O’F’S’md is the output of view View\_BADailyResourceOKToPaySUCFlag (that is run during the configuration’s execution). The view provides the output of variable BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md for the adjoining prior Trading Day for cases where the commitment period for the current Trading Day continues another commitment period for the same resource of the prior Trading Day.
2. Variable BADailyResourcePriorDayOKToPaySUCFlag\_V BrtuT’I’M’O’F’S’md is not reportable in XML-based settlement statement files.

BADailyResourceOffForStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’md =

IF

(OffForStartUpFlagCount BrtuT’I’M’O’F’S’md > 0) Or (DailyResourceShortStartFlag rmd = 1 And OnForIFMPeriodSUCFlag BrtuT’I’M’O’F’S’md = 1)

THEN

BADailyResourceOffForStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’md = 1

ELSE

BADailyResourceOffForStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’md = 0

END IF

OffForStartUpFlagCount BrtuT’I’M’O’F’S’md =

OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif

OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif =

BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif \*   
{

IF JOUChildResourceFlag rmd = 1

THEN

OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif = JOUChildOffForStartUpFlag rO’XYmdhcif

ELSE

(

IF

BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif <= Max(0, (SUC\_NotificationPeriodPMinOperMWhQuantity BrtuT’I’M’O’F’S’XYmdhcif – ToleranceBand BrtF’S’mdhcif ) )

THEN

OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif = 1

ELSE

OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif = 0

END IF

)

END IF

}

BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif =

BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif + 0\* BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif

**Notes:**

1. BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif respresents the output of a view (run during the configuration’s execution) that, for CAISO-committed resources instructed to start-up, effectively expands the variable BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif over a resource’s start-up notification period, including prior Trading Day meter data for cases where a start-up notification period extends into a prior Trading Day. The Trading Days over which BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif is expanded are specified by the set of attribute **X** (Trade Period Start Date) values for variable BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif. The time span for the variable BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif includes those Settlement Intervals where the variable BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif exists (and = 1), as well as the Settlement Intervals of the current Trading Day for which BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif is defined. Variable BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif also defines the set of resources for which variable BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif provides data.
2. To improve calculation performance, in the formula, the added zero value, 0\*BASettlementIntervalResourceGenMeterValue, is provided to enforce calculation of BASettlementIntervalResourceGenMeterValue variable prior to computation of the output charge type. At the same time, this change allows the use of the input, BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V, as the sole business driver for the output charge type, BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue. This formula change should not change the old values of the output charge type as this added value amounts to zero.
3. Variable BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif is not reported on XML-based settlement statements.

SUC\_NotificationPeriodPMinOperMWhQuantity BrtuT’I’M’O’F’S’XYmdhcif =

RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif / 12

Where Exists

BASettlementIntervalResourceStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’XYmdhcif

ToleranceBand BrtF’S’mdhcif =

( Max ( GeneratorToleranceBandMW ,

MaxOperMWBrtF’S’md \* GeneratorToleranceBandPercent ) / 12 )

Where Exists

BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif

OnForCommitmentPeriodSUCFlag BrtuT’I’M’O’F’S’md =

Max(OnForIFMPeriodSUCFlag BrtuT’I’M’O’F’S’md,   
OnForRUCPeriodSUCFlag BrtuT’I’M’O’F’S’md,   
OnForRTMPeriodSUCFlag BrtuT’I’M’O’F’S’md )

EligibleIFMSDC BrtuT’I’M’F’S’mdhcif =

IFMSDC BrtuT’I’M’F’S’mdhcif \* EligibleIFMSDCFlag BrtuT’I’M’F’S’mdh

Where EligibleIFMSDCFlag BrtuT’I’M’F’S’mdh=

 INTMAX(OffForIFMSDCFlag BrtuT’I’M’F’S’mdhcif )

And OffForIFMSDCFlag BrtuT’I’M’F’S’mdhcif =

IFMSDCFlagBrtuT’I’M’F’S’mdhcif\* RealTimeShutDownFlag BrtF’S’mdhcif

Where RealTimeShutDownFlagBrtF’S’mdhcif =

If (IFMSDCBrtuT’I’M’F’S’mdhcif + RTMSDCBrtuT’I’M’F’S’mdhcif= 0 )

Then

RealTimeShutDownFlagBrtF’S’mdhcif= 0

Else

If abs (LoadMeterValue BrtF’S’mdhcif ) < abs (MaxOperMW BrtF’S’md\* 0.75/12)

Then

RealTimeShutDownFlagBrtF’S’mdhcif= 1

Else

RealTimeShutDownFlagBrtF’S’mdhcif= 0

Where LoadMeterValue BrtF’S’mdhcif =

BAResEntitySettlementIntervalMeteredCAISODemandQuantity\_BCRPC BrtF’S’mdhcif

Where

IFMPumpingCost BrtuT’I’M’F’S’mdhcif , RTMPumpingCost BrtuT’I’M’F’S’mdhcif , IFMSDCBrtuT’I’M’F’S’mdhcif , or RTMSDC BrtuT’I’M’F’S’mdhcif exists/is present

**RUC Start-Up Costs**

EligibleRUCSUC BrtuT’I’M’F’S’mdhcif =

Max(0, (RUCSUC BrtuT’I’M’F’S’mdhcif - RMR\_SUCAdj BrtO’mdhcif)) \* EligibleRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif \* BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md

Where EligibleRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif=

(OnForRUCPeriodSUCFlag BrtuT’I’M’O’F’S’md\* BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif )

Where OnForRUCPeriodSUCFlag BrtuT’I’M’O’F’S’md=

INTMAX(OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif )

**Note:**

The INTMAX function ensures that the maximum value of input OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif over all Settlement Intervals of the Trading Day is used in lieu of the 5-minute input in the above calculation that occurs at the daily level.

And OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif =

IF

ExceptionalDispatchShutdownFlag BrtF’S’mdhcif<> 1

THEN

OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif =

(BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif\* ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif )

ELSE

OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif = BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif

END IF

ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif =

IF

(

BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif = 1

And

GenMeterValue BrtF’S’mdhcif > 0

And

GenMeterValue BrtF’S’mdhcif ≥ ( RUCSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif / 12 )   
)

THEN

ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 1

ELSE

ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 0

END IF

RUCSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif =

BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif \* RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif

**RTM Start-Up Costs / Shut-Down Costs**

EligibleRTMSUC BrtuT’I’M’F’S’mdhcif =

( (1 – BADailyResourceRTMCommitOverlapFlag BrtuT’I’M’O’F’S’md) \* BASettlementIntervalResourceCommitEligibleRTMSUC BrtuT’I’M’O’F’S’mdhcif )

BASettlementIntervalResourceCommitEligibleRTMSUC BrtuT’I’M’O’F’S’mdhcif =

(RTMSUC BrtuT’I’M’F’S’mdhcif - RMR\_RTMSUCAdj BrtO’mdhcif)\* EligibleRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif \* BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md

BADailyResourceRTMCommitOverlapFlag BrtuT’I’M’O’F’S’md =

BADailyResourceIFMCommitOverlapRTMFlag BrtuT’I’M’O’O’’F’S’md

Where EligibleRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif =

(OnForRTMPeriodSUCFlag BrtuT’I’M’O’F’S’md \* BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif)

Where OnForRTMPeriodSUCFlag BrtuT’I’M’O’F’S’md=

INTMAX(OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif )

**Note:**

The INTMAX function ensures that the maximum value of input OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif over all Settlement Intervals of the Trading Day is used in lieu of the 5-minute input in the above calculation that occurs at the daily level.

And OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif =

IF

ExceptionalDispatchShutdownFlag BrtF’S’mdhcif<> 1

THEN

OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif = (BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif \* ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif )

ELSE

OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif = BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif

END IF

ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif =

(IF JOUChildResourceFlag rmd = 1

THEN

ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif = JOUChildReachedRTMMinimumLoadFlag rO’mdhcif

ELSE

(

IF

(

BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif = 1

And

GenMeterValue BrtF’S’mdhcif > 0

And

GenMeterValue BrtF’S’mdhcif ≥ ( RTMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif / 12 )   
)

THEN

ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 1

ELSE

ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 0

END IF

)

END IF

RTMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif =

BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif \* RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif

EligibleRTMSDC BrtuT’I’M’F’S’mdhcif =

RTMSDC BrtuT’I’M’F’S’mdhcif \* EligibleRTMSDCFlag BrtuT’I’M’F’S’mdh

Where EligibleRTMSDCFlag BrtuT’I’M’F’S’mdh=

 INTMAX(OffForRTMSDCFlag BrtuT’I’M’F’S’mdhcif )

And OffForRTMSDCFlag BrtuT’I’M’F’S’mdhcif =

RTMSDCFlagBrtuT’I’M’F’S’mdhcif \* RealTimeShutDownFlag BrtF’S’mdhcif

**IFM, RUC, RTM Transition Costs**

EligibleIFMTC BrtuT’I’M’F’S’mdhcif =

 (IFMTC BrtuT’I’M’F’S’mdhcif - RMR\_TCAdj BrtO’mdhcif) \* IFMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif \* BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif )

EligibleRUCTC BrtuT’I’M’F’S’mdhcif =

 Max(0, (RUCTC BrtuT’I’M’F’S’mdhcif - RMR\_TCAdj BrtO’mdhcif))\* RUCTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif \* BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif

EligibleRTMTCBrtuT’I’M’F’S’mdhcif =

 (RTMTC BrtuT’I’M’F’S’mdhcif - RMR\_TCAdj BrtO’mdhcif)\* RTMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif \* BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif)

BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif =

BADailyResourceFromConfigurationOnNotificationPeriodFlag BrtuT’I’M’O’F’S’Y’’Ymd \* BAResourceMSGConfigurationTC\_PMinRealTimeOnFlag BrtuT’I’M’O’F’S’Ymdhcif

Where BAResourceMSGConfigurationTC\_PMinRealTimeOnFlag BrtuT’I’M’O’F’S’Ymdhcif =

BAResourceMSGConfigurationTC\_FlagExists BrtuT’I’M’O’F’S’Ymdhcif \*

(

If  
(

GenMeterValue BrtF’S’mdhcif >

Max (0, (BASettlementIntervalResourceToConfigIDPMinOperMW BrtuT’I’M’O’F’S’Ymdhcif /12 – ToleranceBand BrtF’S’mdhcif ) )

)

Then

BAResourceMSGConfigurationTC\_PMinRealTimeOnFlag BrtuT’I’M’O’F’S’Ymdhcif = 1

Else

BAResourceMSGConfigurationTC\_PMinRealTimeOnFlag BrtuT’I’M’O’F’S’Ymdhcif = 0

End If

)

BASettlementIntervalResourceToConfigIDPMinOperMW BrtuT’I’M’O’F’S’Ymdhcif =

RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif

Where Exists

BAResourceMSGConfigurationTC\_FlagExists BrtuT’I’M’O’F’S’Ymdhcif

BAResourceMSGConfigurationTC\_FlagExists BrtuT’I’M’O’F’S’Ymdhcif =

Max(IFMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif, RUCTCConfigurationFlag

BrtuT’I’M’O’F’S’Ymdhcif,

RTMTCConfigurationFlag BrtuT’I’M’O’F’S’Ymdhcif )

BADailyResourceFromConfigurationOnNotificationPeriodFlag BrtuT’I’M’O’F’S’Y’’Ymd =

IF

FromConfigurationOnFlagCount BrtuT’I’M’O’F’S’Y’’Ymd > 0

THEN

BADailyResourceFromConfigurationOnNotificationPeriodFlag BrtuT’I’M’O’F’S’Y’’Ymd = 1

ELSE

BADailyResourceFromConfigurationOnNotificationPeriodFlag BrtuT’I’M’O’F’S’Y’’Ymd = 0

END IF

FromConfigurationOnFlagCount BrtuT’I’M’O’F’S’Y’’Ymd =

(FromConfigurationOnFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif \* BASettlementIntervalResourceMSGTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif )

Where Exists

BASettlementIntervalResourceMSGTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif

FromConfigurationOnFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif =

ATTRIBUTE SWAP (Y’’, Y) On OnForFromTransitionFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif

OnForFromTransitionFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif =

If

BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif >= Max(0, (BASettlementIntervalResourceFromConfigIDPMinOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif / 12 – ToleranceBand BrtF’S’mdhcif ) )

And

BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif <= BASettlementIntervalResourceFromConfigIDPMaxOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif / 12

THEN

OnForFromTransitionFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif = 1

ELSE

OnForFromTransitionFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif = 0

END IF

BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif =

BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif + 0\*BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif

**Notes:**

1. BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif respresents the output of a view (run during the configuration’s execution) that, for CAISO-committed MSG resources instructed to transition between two (2) MSG configurations, effectively expands the variable BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif over a MSG resource’s configuration transition notification period, including prior Trading Day meter data for cases where a MSG configuration transition notification period extends into a prior Trading Day. The Trading Days over which BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif is expanded are specified by the set of attribute X values for variable BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif. The time span for the variable BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif includes those Settlement Intervals where the variable BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif exists (and = 1). Variable BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif also defines the set of resources for which variable BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif provides data.
2. To improve calculation performance, in the formula, the added zero value, 0\*BASettlementIntervalResourceGenMeterValue, is provided to enforce calculation of BASettlementIntervalResourceGenMeterValue variable prior to computation of the output charge type. At the same time, this change allows the use of the input, BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V, as the sole business driver for the output charge type, BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue. This formula change should not change the old values of the output charge type as this added value amounts to zero.
3. Variable BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif is not reported on XML-based settlement statements.

BASettlementIntervalResourceFromConfigIDPMinOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif =

RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif

Where Exists

BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif

BASettlementIntervalResourceFromConfigIDPMaxOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif =

BADailyResourceConfigID\_TCPMaxOperMW BrtF’S’Ymd

Where Exists

BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif

BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif =

ATTRIBUTE SWAP (Y’’, Y) On BASettlementIntervalResourceMSGTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif

**RMR-related commitment costs**

Note these adjustments will be relevant only to RMR resources.

Assumption: For RMR MSG, only one MSG configuration ID per commitment period in any market.

BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd =

Average over (Y’’) BADailyRMRResFlag BrtuT’I’M’O’F’S’Y’’Ymd

**RMR Minimum Load Costs:**

RMRMLCAdj BrtYmdhcif =

RMRMLCAdj BrtYmdhcif = (MLC\_OCAdderAmt BrtYmd + MLC\_MMAdderAmt BrtYmd ) / 12

Note: The daily values will be repeated for each hour. The division by 12 above then converts the hourly values to 5-minute output values.

IFMRMRResMLCAdj Brtmdhcif =

Max over (u, T’, I’, M’, F’, S’, O’, Y)

If (IFMMLC BrtuT’I’M’F’S’Ymdhcif <> 0)

Then

BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif \* RMRMLCAdj BrtYmdhcif

Else

0

End If

Implementation Note: Business driver is BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd .

RTMNonMultiStageRMRMLCAdj BrtYmdhcif =

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

(

If ( BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif = 1)

Then

[If ( BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif = 1) Then

0

Else

RMRMLCAdj BrtYmdhcif

]

Else {resource is not committed or not eligible in RTM}

[If ( BADispatchIntervalResourceMSGConfigIDIFMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif = 1) Then

(-1) \* IFMRMRResMLCAdj Brtmdhcif

Else

0

]

End If]

End If

)

Implementation Note: Business driver is BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd . Exclude MSG resoures, RMR\_MSGResFlag rmd.

RTMMultiStageRMRMLCAdj BrtYmdhcif =

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

(

If (RTMMLC BrtuT’I’M’F’S’Ymdhcif) <> 0 And (BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif = 1)

Then

(BADispatchIntervalResourceMSGConfigIDRTMMLCostEligibleFlag BrtuT’I’M’F’S’Ymdhcif \* RMRMLCAdj BrtYmdhcif

- IFMRMRResMLCAdj Brtmdhcif )

Else

0

End If

)

Implementation Note: Business driver is BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd . Exclude non-MSG resoures, RMR\_NonMSGResFlag rmd.

RTM\_RMRMLCAdj BrtYmdhcif =

RTMMultiStageRMRMLCAdj BrtYmdhcif + RTMNonMultiStageRMRMLCAdj BrtYmdhcif

**RMR Startup Costs:**

RMRSUCAdder BrtYmd =

RMRSUCAdder BrtYmd = SUC\_OCAdderAmt BrtYmd + SUC\_MMAdderAmt BrtYmd

RMRCommitPeriodEligibleSUCFlag BrtO’Ymdhcif =

Max over (u, T’, I’, M’, F’, S’)

{INTDUPLICATE(OnForRTMPeriodSUCFlag BrtuT’I’M’O’F’S’md )\*[Min(1,( BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif+ BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcif+ BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcif)] \* INTDUPLICATE(BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd)}

Implementation Note: Business driver is BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd .

RMRCommitPeriodEligibleSUCTotIntervals BrtO’Ymd =

Sum over (h, c, i, f) { RMRCommitPeriodEligibleSUCFlag BrtO’Ymdhcif }

RMRCommitPeriodEligibleSUCRate BrtO’Ymd =

(RMRSUCAdder BrtYmd ) / RMRCommitPeriodEligibleSUCTotIntervals BrtO’Ymd

RMR\_SUCAdj BrtO’mdhcif =

Sum over (Y) {RMRCommitPeriodEligibleSUCFlag BrtO’Ymdhcif \* INTDUPLICATE(RMRCommitPeriodEligibleSUCRate BrtO’Ymd )}

RMR\_RTMSUCAdj BrtO’mdhcif =

Sum over (u, T’, I’, M’, F’, S’, Y)

{If RTMSUC BrtuT'I'M'F'S'mdhcif > 0

Then

(If (RTMSUC BrtuT'I'M'F'S'mdhcif < RMR\_SUCAdj BrtO'mdhcif )

Then

RMR\_RTMSUCAdj BrtO’mdhcif = RTMSUC BrtuT'I'M'F'S'mdhcif

Else

RMR\_RTMSUCAdj BrtO’mdhcif = RMR\_SUCAdj BrtO'mdhcif

End If

Else

RMR\_RTMSUCAdj BrtO’mdhcif = 0

End If

}

Implementation Note: Business driver is BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd .

**RMR Transition Costs:**

RMREligibleTCFlag BrtO’Y”Ymdhcif =

Max over (u, T’, I’, M’, F’, S’)

BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif \* BADailyRMRResFlag BrtuT’I’M’O’F’S’Y’’Ymd

Implementation Note: Business driver is BADailyRMRResFlag BrtuT’I’M’O’F’S’Y’’Ymd .

CommitPeriodEligibleTCTotIntervals BrtO’Y”Ymd =

Sum over (h, c, i, f) RMREligibleTCFlag BrtO’Y”Ymdhcif

CommitPeriodEligibleTCRate BrtO’Y”Ymd =

(TC\_OCAdderAmt BrtY”Ymd + TC\_MMAdderAmt BrtY”Ymd)/CommitPeriodEligibleTCTotIntervals BrtO’Y”Ymd

Implementation Note: Division by zero in this formula will result to a value of zero.

RMR\_TCAdj BrtO’mdhcif =

Sum over (Y”, Y) (RMREligibleTCFlag BrtO’Y”Ymdhcif \* CommitPeriodEligibleTCRate BrtO’Y”Ymd )

**Joint Owned Units (JOU) related calculations**

These calculations will be relevant only to JOU resources. These are either made at the child level or parent level detail for JOU.

1. Associations

JOUChildResourceFlag rmd =

Max over (B,t,j’’,u,T’,I’,M’,F’,S’) JOUResourceAssociationFlag Brtj’’uT’I’M’F’S’md

JOUParentChildAssociationFlag rj’’md =

Max over (B,t,u,T’,I’,M’,F’,S’) JOUResourceAssociationFlag Brtj’’uT’I’M’F’S’md

JOUParentChildSettlementIntervalStartUpNotificationPeriodFlag rj’’O’XYmdhcif =

Max over (B, t, u, T’, I’, M’, F’, S’) { BASettlementIntervalJOUParentChildStartUpNotificationPeriodFlag Brtj’’uT’I’M’O’F’S’XYmdhcif }

1. Advisory Shutdown

JOUChildSettlementIntervalAdvisoryShutdownUIEFlag rmdhcif =

Max over (j’’) { JOUParentSettlementIntervalAdvisoryShutdownUIEFlag j’’mdhcif }

Where exists

JOUParentChildAssociationFlag rj’’md

JOUParentSettlementIntervalAdvisoryShutdownUIEFlag j’’mdhcif =

IF

JOUParentSettlementIntervalExpectedEnergyUIEDifference j’’mhcif <= JOUParentSettlementIntervalCumulativeUIEPMinTestLimit j’’mdhcif

THEN

JOUParentSettlementIntervalAdvisoryShutdownUIEFlag j’’mdhcif = JOUParentDispatchIntervalAdvisoryShutdownFlag j’’mdhcif

ELSE

JOUParentSettlementIntervalAdvisoryShutdownUIEFlag j’’mdhcif = 0

END IF

JOUParentSettlementIntervalExpectedEnergyUIEDifference j’’mhcif =

Sum over (B,r,t,u,T’,I’,M’,F’,S’)

BASettlementIntervalResourceExpectedEnergyUIEDifference BrtuT’I’M’F’S’mdhcif

Where exists

JOUResourceAssociationFlag Brtj’’uT’I’M’F’S’md

JOUParentSettlementIntervalCumulativeUIEPMinTestLimit j’’mdhcif =

JOUParentRealTimePMinOperMWhQuantity j’’mdhcif

Where Exists

JOUParentDispatchIntervalAdvisoryShutdownFlag j’’mdhcif

JOUParentDispatchIntervalAdvisoryShutdownFlag j’’mdhcif =

Max over (B,r,t,u,T’,I’,M’,F’,S’)

{BADispatchIntervalAdvisoryShutdownFlag BrtuT’I’M’F’S’mdhcif }

Where Exists

JOUResourceAssociationFlag Brtj’’uT’I’M’F’S’md

1. MLC Pmin Check

#### JOUChildMLC\_PMinRealTimeOnFlag rmdhcif =

Max over (j’’) { JOUParentMLC\_PMinRealTimeOnFlag j’’mdhcif }

Where exists

JOUParentChildAssociationFlag rj’’md

JOUParentMLC\_PMinRealTimeOnFlag j’’mdhcif =

IF

JOUParentMLC\_PMinRealTimeCheckFlag j’’mdhcif> 0

And

JOUParentGenMeterValue j’’mdhcif > 0

And

(JOUParentGenMeterValue j’’mdhcif ≥

JOUParentPMinLessToleranceBandQuantity j’’mdhcif )

THEN

JOUParentMLC\_PMinRealTimeOnFlag j’’mdhcif= 1

ELSE

JOUParentMLC\_PMinRealTimeOnFlag j’’mdhcif = 0

END IF

JOUParentMLC\_PMinRealTimeCheckFlag j’’mdhcif =

Max over (B,r,t,u,T’,I’,M’,F’,S’,Y) { BADispatchIntervalJOUParentChildRTMMLCostEligibleFlag Brtj’’uT’I’M’F’S’Ymdhcif}

JOUParentPMinLessToleranceBandQuantity j’’mdhcif =

max(0, JOUParentRealTimePMinOperMWhQuantity j’’mdhcif–JOUParentToleranceBand j’’mdhcif )

JOUParentRealTimePMinOperMWhQuantity j’’mdhcif =

JOUParentRealTimePMinOperMW j’’mdhcif /12

JOUParentRealTimePMinOperMW j’’mdhcif =

Max(INTDUPLICATE(JOUParentPMinOperMW j’’md), JOUParent5mRTMLowerOperLimit j’’mdchif )

1. Resource is Off Check

JOUChildOffForStartUpFlag rO’XYmdhcif =

Max over (j’’) { JOUParentOffForStartUpFlag rj’’O’XYmdhcif }

JOUParentOffForStartUpFlag rj’’O’XYmdhcif =

JOUParentChildSettlementIntervalStartUpNotificationPeriodFlag rj’’O’XYmdhcif \*   
(

IF

JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue j’’Xmdhcif <= Max(0, (JOUParentSUC\_NotificationPeriodPMinOperMWhQuantity j’’O’XYmdhcif –JOUParentToleranceBand j’’mdhcif ) )

THEN

JOUParentOffForStartUpFlag rj’’O’Xymdhcif = 1

ELSE

JOUParentOffForStartUpFlag rj’’O’Xymdhcif = 0

END IF

)

JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue j’’Xmdhcif =

JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue\_V j’’Xmdhcif + 0\* JOUParentGenMeterValueQuantity j’’mdhcif

**Notes:**

1. JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue\_V j’’Xmdhcif respresents the output of a view (run during the configuration’s execution) that, for CAISO-committed JOU resources instructed to start-up, effectively expands the variable JOUParentGenMeterValueQuantity j’’mdhcif over a JOU parent’s start-up notification period, including prior Trading Day meter data for cases where a start-up notification period extends into a prior Trading Day. The Trading Days over which JOUParentGenMeterValueQuantity j’’mdhcif is expanded are specified by the set of attribute **X** (Trade Period Start Date) values for variable JOUParentChildSettlementIntervalStartUpNotificationPeriodFlag rj’’O’XYmdhcif. The time span for the variable JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue\_V j’’Xmdhcif provides data.
2. To improve calculation performance, in the formula, the added zero value, 0\*JOUParentGenMeterValueQuantity, is provided to enforce calculation of JOUParentGenMeterValueQuantity variable prior to computation of the output charge type. At the same time, this change allows the use of the input, JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue\_V. This formula change should not change the old values of the output charge type as this added value amounts to zero.

Variable JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue\_V j’’Xmdhcif is not reported on XML-based settlement statements.

JOUParentSUC\_NotificationPeriodPMinOperMWhQuantity j’’O’XYmdhcif =

Average over (r) {JOUParentRealTimePMinOperMWhQuantity j’’mdhcif }

Where Exists

JOUParentChildSettlementIntervalStartUpNotificationPeriodFlag rj’’O’XYmdhcif

JOUParentToleranceBand j’’mdhcif =

{ Max ( GeneratorToleranceBandMW ,

INTDUPLICATE(JOUParentMaxOperMWj’’md )\* GeneratorToleranceBandPercent )} / 12

Where Exists

JOUParentGenMeterValueQuantity j’’mdhcif

JOUParentGenMeterValueQuantity j’’mdhcif =

JOUParentGenMeterValue j’’mdhcif

1. SUC Commitment Period Reached Pmin Check

JOUChildReachedRTMMinimumLoadFlag rO’mdhcif =

Max over (j’’) {JOUParentReachedRTMMinimumLoadFlag rj’’O’mdhcif}

Note: JOU child resource r inherits value from JOU parent j’’.

JOUParentReachedRTMMinimumLoadFlag rj’’O’mdhcif =

IF

(

JOUParentRTMSUCFlag j’’O’mdhcif = 1

And

JOUParentGenMeterValue j’’mdhcif > 0

And

JOUParentGenMeterValue j’’mdhcif ≥ ( JOUParentRTMSUC\_PMinOperMWhQuantity j’’O’mdhcif )   
)

THEN

JOUParentReachedRTMMinimumLoadFlag rj’’O’mdhcif= 1

ELSE

JOUParentReachedRTMMinimumLoadFlag rj’’O’mdhcif= 0

END IF

Where Exists JOUParentChildRTMSUCFlag rj’’O’mdhcif

JOUParentRTMSUC\_PMinOperMWhQuantity j’’O’mdhcif =

JOUParentRTMSUCFlag j’’O’mdhcif \* JOUParentRealTimePMinOperMWhQuantity j’’mdhcif

JOUParentRTMSUCFlag j’’O’mdhcif =

Max over (r) { JOUParentChildRTMSUCFlag rj’’O’mdhcif }

JOUParentChildRTMSUCFlag rj’’O’mdhcif =

Max over (B,t,u,T’,I’,M’,F’,S’, Y) {BASettlementIntervalJOUParentChildRTMSUCFlag Brtj’’uT’I’M’O’F’S’Ymdhcif }

## Outputs

| ID | Name | Description |
| --- | --- | --- |
| -- | In addition to any outputs listed below, all inputs shall be included as outputs. |  |
|  | AvailableIFMMLCBrtuT’I’M’F’S’mdhcif | Available IFM Minimum Load Costs (in $). |
|  | BASettlementIntervalAdvisoryShutdownUIEFlag BrtuT’I’M’F’S’mdhcif | A flag output (binary 0/1 value) that indicates whether UIE has accumulated following an advisory shutdown instruction to the point where the resource’s expected energy minus UIE accumulated since the time that the advisory shutdown instruction was issued is less than the resource’s currently instructed PMin value. The latter test condition is performed separately for each Settlement Interval; the flag output is set if the test condition is met.  The flag (when = 1) serves to disable MLC BCR for the current Settlement Interval. |
|  | BASettlementIntervalResourceExpectedEnergyUIEDifference BrtuT’I’M’F’S’mdhcif | The total Expected Energy minus the cumulative UIE (in MWh) for a resource over a Settlement Interval. |
|  | BASettlementIntervalResourceCumulativeUIEPMinTestLimit BrtuT’I’M’F’S’mdhcif | The PMin-based limit (in MWh) for the cumulative UIE test that checks for cumulative UIE being less than PMin (in MW) / 12. |
|  | BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif | The UIE (in MWh) accumulated since the time that an advisory shutdown instruction was issued to a resource. |
|  | BASettlementIntervalResourceCumulativeUIE\_V BrtuT’I’M’F’S’mdhcif | The UIE (in MWh) accumulated for a resource from the time that an advisory shutdown instruction was issued to a resource through the end of a given Settlement Interval.  The charge type output stores the view results presented by view BASettlementIntervalResourceCumulativeUIE\_View during the configuration calculation. As the output is transient in nature, it is captured during the calculation and transferred to charge type output BASettlementIntervalResourceCumulativeUIE BrtuT’I’M’F’S’mdhcif. |
|  | BASettlementIntervalResourceCumulativeUIE\_View BrtuT’I’M’F’S’mdhcif | The UIE (in MWh) accumulated for a resource from the time that an advisory shutdown instruction was issued to the resource through the end of a given Settlement Interval.  The variable represents the view results received during the configuration calculation from view BASettlementIntervalResourceCumulativeUIE\_View. |
|  | BADailyResourceEndOfPriorDayCumulativeUIE BrtuT’I’M’F’S’md | The UIE (in MWh) accumulated for a resource from the time that an advisory shutdown instruction was issued to the resource through the end (of the last Settlement Interval) of the prior Trading Day or until output flag BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif = 1, whichever comes first.. |
|  | BADailyResourceEndOfPriorDayCumulativeUIE\_V BrtuT’I’M’F’S’md | The UIE (in MWh) accumulated for a resource from the time that an advisory shutdown instruction was issued to a resource through the end (of the last Settlement Interval) of the prior Trading Day or until output flag BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif = 1, whichever comes first.  The output stores the view results presented by view BADailyResourceEndOfPriorDayCumulativeUIE during the configuration calculation. As the output is transient in nature, it is captured during the calculation and transferred to charge type output BADailyResourceEndOfPriorDayCumulativeUIE BrtuT’I’M’F’S’md. |
|  | SettlementIntervalPositiveRealTimeUIEBrtuT’I’M’F’S’mdhcif | Positive real-time UIE (in MWh) for a given resource and Settlement Interval. |
|  | BASettlementIntervalAllAdvisoryShutdownConditionsFlag BrtuT’I’M’F’S’mdhcif | A flag output (binary 0/1 value) that indicates for a particular resource and Settlement Interval of a commitment period whether all of the conditions for an advisory shutdown of the resource have been met.  The flag (when = 1) serves to disable MLC BCR for the Settlement Interval. |
|  | AvailableRUCMLCBrtuT’I’M’F’S’mdhcif | Available RUC Minimum Load Costs (in $) (used in a successor charge code calculation in conjunction with the RT Performance Metric to determine the Eligible RUC Minimum Load Costs) for a given resource and Settlement Interval. |
|  | AvailableRTMMLCBrtuT’I’M’F’S’mdhcif | Available RTM Minimum Load Costs (in $) (used in a successor charge code calculation in conjunction with the RT Performance Metric to determine the Eligible RTM Minimum Load Costs) for a given resource and Settlement Interval. |
|  | MLC\_PMinRealTimeOnFlag BrtF’S’mdhcif | A binary value (1/0) that indicates whether (= 1) or not (= 0) for a given resource and Settlement Interval the resource operated at or above the relevant PMin level (the resource’s PMin value for a non-MSG resource and the relevant MSG configuration’s PMin level for a MSG resource) minus the Tolerance Band. |
|  | MLC\_PMinRealTimeOnFlagCount BrtF’S’mdhcif | Count (as an integer value) that reflects the number of MLC Cost Eligibility flag inputs that = 1 for a given Settlement Interval. |
|  | GenMeterValue BrtF’S’mdhcif | Generation or Import meter value for a given resource and Settlement Interval. The output is valid only in the presence of MLC, SUC and TC inputs. |
|  | BASettlementIntervalResourceIFMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif | A binary-valued (0/1) flag that, when = 1, indicates IFM Minimum Load Costs for a given Settlement Interval are qualified for cost compensation.  Qualified = 1; Not qualified = 0.  Attribute Y shall be NULL for a non-MSG resource. |
|  | BASettlementIntervalResourceRUCMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif | A binary-valued (0/1) flag that, when = 1, indicates RUC Minimum Load Costs for a given Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource. |
|  | BASettlementIntervalResourceRTMMLCostEligibleFlag BrtuT’I’M’F’S’mdhcif | A binary-valued (0/1) flag that, when = 1, indicates RTM Minimum Load Costs for a given Settlement Interval are qualified for cost compensation.  Qualified = 1, Not qualified = 0. Attribute Y shall be NULL for a non-MSG resource. |
|  | BASettlementIntervalResourceGenMeterValue BrtuT’I’M’F’S’mdhcif | Generation or Import meter value (in MWh) for a given resource and Settlement Interval. |
|  | MLC\_PMinLessToleranceBandQuantity BrtF’S’mdhcif | Minimum operating limit minus the Tolerance Band (in MWh) on which Minimum Load Cost is based for a given resource and Settlement Interval.  For a MSG resource¸ the output represents the Minimum Operating MWh limit minus the Tolerance Band for the specified Resource ID and an associated MSG Configuration ID; for a non-MSG resource, the output represents the Minimum Operating MWh limit minus the Tolerance Band for the resource. |
|  | MLC\_PMinOperMWhQuantity BrtF’S’mdhcif | Minimum operating limit (in MWh) on which Minimum Load Cost is based for a given resource and Settlement Interval. For a MSG resource¸ the output represents the Minimum Operating MWh limit for the specified Resource ID and an associated MSG Configuration ID; for a non-MSG resource, the output represents the Minimum Operating MWh limit for the resource. |
|  | BASettlementIntervalResourceLatestInstructedMarketCodeFactor BrtF’S’mdhcif | Code (as a binary coded decimal value) that reflects the latest market in which a resource received a CAISO commitment instruction. The market of the most recent CAISO commitment instruction for a given Settlement Interval is decoded as follows:     | Latest Market | CAISO Committment | | | Output Value | | --- | --- | --- | --- | --- | |  | RTM | RUC | IFM |  | | None |  |  |  | 0 | | IFM |  |  | X | 1 | | RUC |  | X |  | 2 | | RUC |  | X | X | 3 | | RTM | X |  |  | 4 | | RTM | X |  | X | 5 | | RTM | X | X |  | 6 | | RTM | X | X | X | 7 | |
|  | IFMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif | Minimum operating limit (in MW) on which IFM Minimum Load Cost is based for a given resource and Settlement Interval. The output value reflects any Pmin re-rate in effect for the Settlement Interval. |
|  | RUCMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif | Minimum operating limit (in MW) on which RUC Minimum Load Cost is based for a given resource and Settlement Interval. The output value reflects any Pmin re-rate in effect for the Settlement Interval. |
|  | RealTimeConfigID\_PMinOperMW BrtF’S’Ymdhcif | Minimum operating limit (in MW – as provided in Master File) or Pmin (including any Pmin re-rate) effective as of Real Time market for a given resource configuration and Settlement Interval. |
|  | RTMMLC\_PostRerateAdjustmentPMinOperMW BrtF’S’mdhcif | Minimum operating limit (in MW) on which RTM Minimum Load Cost is based for a given resource and Settlement Interval. The output value reflects any Pmin re-rate in effect for the Settlement Interval. |
|  | IFMMLC\_PMinOperMW BrtF’S’mdhcif | Minimum operating limit (in MW) on which IFM Minimum Load Cost is based for a given resource and Settlement Interval. The output value does not reflect any Pmin re-rate in effect for the Settlement Interval. |
|  | RTMMLC\_PMinOperMW BrtF’S’mdhcif | Minimum operating limit (in MW) on which RTM Minimum Load Cost is based for a given resource and Settlement Interval. The output value does not reflect any Pmin re-rate in effect for the Settlement Interval. |
|  | AvailableIFMPumpingCost BrtuT’I’M’F’S’mdhcif | Available IFM Pumping Cost as a negative value (in U.S. $) that represents the amount the pumping resource is willing to pay to pump or serve load for a given Settlement Interval. |
|  | AvailableRTMPumpingCost BrtuT’I’M’F’S’mdhcif | Available RTM Pumping Costs as a negative value (in U.S. $) that represents the amount the pumping resource is willing to pay to pump or serve load for a given Settlement Interval. |
|  | BAResEntitySettlementIntervalMeteredCAISODemandQuantity\_BCRPC BrtF’S’mdhcif | Meter value for a given Participating Load (Pump or Pump-Storage) resource and Settlement Interval. |
|  | EligibleIFMSUC BrtuT’I’M’F’S’mdhcif | Eligible IFM Start-Up Costs for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceCommitNonOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif | Eligible IFM SUC quantity (in $) that results from an IFM commitment for which an IFM allocation of IFM SUC applies. |
|  | BASettlementIntervalResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’mdhcif | The eligible SUC (in $) that has been incurred in the first of any number of RTM commitment periods that overlap an IFM commitment period, but that will be settled as Eligible IFM SUC (for allocation purpose). |
|  | BADailyResourceCommitOverlapEligibleIFMSUCIntervalRate BrtuT’I’M’O’F’S’md | The total SUC (in $/MWh) divided by the number of Settlement Intervals in an IFM commitment period, where the SUC has been incurred in the first of any number of RTM commitment periods that overlaps the IFM commitment period, but will be settled as Eligible IFM SUC (for allocation purpose). Attribute O’ represents the IFM commitment period. |
|  | BADailyResourceCommitOverlapEligibleIFMSUC BrtuT’I’M’O’F’S’md | The eligible SUC (in $) that has been incurred in the first of any number of RTM commitment periods that overlap an IFM commitment period, but will be settled as Eligible IFM SUC (for allocation purpose). Attribute O’ represents the IFM commitment period. |
|  | BADailyResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’md | The eligible SUC (in $) that has been incurred in the first of any number of RTM commitment periods that overlap an IFM commitment period, but that will be settled as Eligible IFM SUC (for allocation purpose). Attribute O’ represents the RTM commitment period and O’’ represent the IFM commitment period, where the eligible SUC is presented for the RTM Settlement Intervals. |
|  | BASettlementIntervalResourceIFMCommitOverlapEligibleRTMSUC BrtuT’I’M’O’O’’F’S’mdhcif | The eligible SUC (in $) that has been incurred in a Settlement Interval within the first of any number of RTM commitment periods that overlap an IFM commitment period and that will be settled as Eligible IFM SUC (for allocation purpose). Attribute O’ represents the RTM commitment period and O’’ represent the IFM commitment period. |
|  | BADailyResourceIFMCommitOverlapPeriodIntervalCount BrtuT’I’M’O’F’S’md | The count (as an integer value) of the number of Settlement Intervals in an IFM commitment period that contains an overlapping RTM commitment period, for which the SUC has been incurred in the RTM commitment period, but will be settled as Eligible IFM SUC (for allocation purpose), where the overlapping RTM commitment period is the first occuring of any number of RTM commitment periods that may overlap with the IFM commitment period. Attribute O’ represents the IFM commitment period. |
|  | BADailyResourceIFMCommitOverlapFlag BrtuT’I’M’O’F’S’md | Indication (binary 0/1) of whether or not the IFM commitment period overlaps with a commitment period for another market type (for instance, RTM). The output = 1 to indicate an IFM commitment period overlap with another commitment period. |
|  | EligibleIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif | IFM Start-Up Costs eligibility flag.  IFM SUC eligibility = 1;  IFM SUC ineligibility = 0. |
|  | OnForIFMPeriodSUCFlag BrtuT’I’M’O’F’S’md | Flag (0/1) indicating (when =1) that resource reached or exceeded Minimum Load Energy for the relevant IFM Commitment Period O’. |
|  | OnForIFMSUCFlag BrtuT’I’M’O’F’S’mdhcif | Intermediate flag (0/1) indicating (when = 1) IFM SUC eligibility based upon BAResourceMSGConfigurationIFMSUCFlag BrtuT’I’M’O’F’S’Ymdhcifand ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif= 1. |
|  | ReachedIFMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif | Flag (0/1) indicating (when = 1) that Resource ID r operated at or above the relevant IFM Minimum Load level, where the Configuration ID Y indicates the start-up configuration in the case of a MSG resource and is NULL for a non-MSG resource. |
|  | IFMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif | PMin Energy (in MW) of a IFM-committed resource for the specified Settlement Interval. |
|  | BADailyResourceOKToPaySUCFlag BrtuT’I’M’O’F’S’md | A flag output (0/1) that (when = 1) indicates (a) the start-up cost recovery requirements have been met (for SUC to participate in BCR) in relation to the resource being not On for at least one Settlement Interval of its start-up notification period and then On for actual start-up (with both conditions based on a resource’s PMin and meter input values) and (b) the resource was not already paid SUC for the same start-up on the prior Trading Day. |
|  | BADailyResourcePriorDayOKToPaySUCFlag BrtuT’I’M’O’F’S’md | A flag output (0/1) that (when = 1) indicates (a) the start-up cost recovery requirements (for SUC to participate in BCR) that relate to the resource being not On for at least one Settlement Interval of its start-up notification period and then On for actual start-up (with both conditions based on a resource’s PMin and meter input values) have been met for the prior Trading Day and (b) the resource was already paid SUC for the same start-up on the prior Trading Day or earlier. |
|  | BADailyResourcePriorDayOKToPaySUCFlag\_V BrtuT’I’M’O’F’S’md | A flag output (0/1) that (when = 1) indicates (a) the start-up cost recovery requirements (for SUC to participate in BCR) that relate to the resource being not On for at least one Settlement Interval of its start-up notification period and then On for actual start-up (with both conditions based on a resource’s PMin and meter input values) have been met for the prior Trading Day and (b) the resource was already paid SUC for the same start-up on the prior Trading Day or earlier.  The output stores the view results presented by view BADailyResourcePriorDayOKToPaySUCFlag during the configuration calculation. As the output is available only for the duration of the calculation, for long-term storage it is transferred to charge type output BADailyResourcePriorDayOKToPaySUCFlag BrtuT’I’M’O’F’S’md. |
|  | BADailyResourceOffForStartUpNotificationPeriodFlag BrtuT’I’M’O’F’S’md | A flag output (0/1) that (when = 1) indicates that the start-up cost recovery requirement relating to a resource being not On (based on the resource’s PMin and meter input values) for at least one Settlement Interval of its start-up notification period (in order for the resource’s SUC to be included in BCR) has been met over the span of the current Trading Day and any adjacent prior Trading Day for which the notification period applies.  For a Short Start Unit resource, starting up towards a CAISO IFM Commitment Period on the same Trading Day, and as long as the resource was also On for the same commitment period, value is set to 1 for this variable. |
|  | OffForStartUpFlagCount BrtuT’I’M’O’F’S’md | A count (as an integer value) of the number of Settlement Intervals of the current Trading Day where a resource is not On (based on the resource’s PMin and meter input values) over its start-up notification period. |
|  | OffForStartUpFlag BrtuT’I’M’O’F’S’XYmdhcif | A flag output (0/1) that (when = 1) indicates that a resource is not On (based on its PMin and meter input values) for a given Settlement Interval of its start-up notification period , implying that the resource has met its start-up notification period requirement that the resource be not On for at least one Settlement Interval of the period in order for the resource’s SUC to participate in BCR. |
|  | BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif | The meter output (in MWh) of a CAISO-committed resource that has received a start-up notification. The output is valid for all Settlement Intervals of the resource’s start-up notification period as well as its commitment period. |
|  | BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif | The meter output (in MWh) of a CAISO-committed resource that has received a start-up notification. The output reflects the results of a query output. As the output is only available during the calculation, for long-term storage it is transferred to charge type BASettlementIntervalResourceStartUpNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif. The output is valid for all Settlement Intervals of the resource’s start-up notification period. |
|  | SUC\_NotificationPeriodPMinOperMWhQuantity BrtuT’I’M’O’F’S’XYmdhcif | Minimum Operating MWh limit used to qualify Start-Up Cost. For a MSG resource the output presents the Minimum Operating MWh limit for a relevant Resource ID and MSG Configuration ID combination. For a non-MSG resource the output presents the Minimum Operating MWh limit for the given Resource ID.  The output is valid only for Settlement Intervals that are associated with a Start-Up Notification Period. |
|  | ToleranceBand BrtF’S’mdhcif | Tolerance Band at a Settlement Interval basis and resource-specific level. |
|  | OnForCommitmentPeriodSUCFlag BrtuT’I’M’O’F’S’md | A flag output (0/1) that (when = 1) indicates a resource is On (based on its PMin and meter input values) for at least one Settlement Interval of its ISO commitment period, implying that the resource has met its commitment period start-up requirement that the resource be On for at least one Settlement Interval of the period in order for the resource’s SUC to be included in BCR. The output = 0 when the latter “On” condition is not satisfied. |
|  | EligibleIFMSDC BrtuT’I’M’F’S’mdhcif | IFM Eligible Shut-Down Costs for a given pump resource and Settlement Interval. |
|  | EligibleIFMSDCFlag BrtuT’I’M’F’S’mdh | IFM Eligible Shut-Down flag (0/1) for a given pump resource and Trading Hour.  Eligible IFM shut-down = 1;  Non-eligible IFM shut-down = 0. |
|  | OffForIFMSDCFlag BrtuT’I’M’F’S’mdhcif | Intermediate flag (0/1) indicating IFM Shut-Down Costs eligibility based upon IFMSDCFlag BrtuT’I’M’F’S’mdhcifand RealTimeShutDownFlag BrtF’S’mdhciffor a given pump resource and Settlement Interval.  Unit shut-down for IFM = 1; Unit not shut-down for IFM = 0. |
|  | RealTimeShutDownFlag BrtF’S’mdhcif | Flag (0/1) that indicates that a given resource was not pumping for the specified Settlement Interval.  Unit shut-down for IFM or RTM = 1;  Unit not shut-down for IFM or RTM = 0. |
|  | EligibleRUCSUC BrtuT’I’M’F’S’mdhcif | Eligible RUC Start-Up Costs for a given resource and Settlement Interval. |
|  | EligibleRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif | RUC Start-Up Costs eligibility flag (0/1) for a given resource and Settlement Interval.  RUC SUC eligibility = 1;  RUC SUC ineligibility = 0. |
|  | OnForRUCPeriodSUCFlag BrtuT’I’M’O’F’S’md | Flag (0/1) indicating (when = 1) that resource reached or exceeded Minimum Load Energy for the relevant RUC Commitment Period O’ for a given resource. |
|  | OnForRUCSUCFlag BrtuT’I’M’O’F’S’mdhcif | Intermediate flag (0/1) indicating RUC SUC eligibility based upon BAResourceMSGConfigurationRUCSUCFlag BrtuT’I’M’O’F’S’Ymdhcifand ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhciffor a given resource and Settlement Interval.  RUC SUC eligibility = 1;  RUC SUC ineligibility = 0. |
|  | ReachedRUCMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif | Flag (0/1) indicating (when = 1) that Resource ID r operated at or above the relevant RUC Minimum Load level, where the Configuration ID Y indicates the start-up configuration in the case of a MSG resource and is NULL for a non-MSG resource. |
|  | RUCSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif | PMin Energy (in MW) of a RUC-committed resource for the specified Settlement Interval. |
|  | EligibleRTMSUC BrtuT’I’M’F’S’mdhcif | Eligible RTM Start-Up Costs for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceCommitEligibleRTMSUC BrtuT’I’M’O’F’S’mdhcif | Eligible RTM-incurred Start-Up Costs (in $) for a given resource and Settlement Interval. The costs are payed in RTM, but are intended to be allocated to IFM, if the Commitment Period O’ represents a RTM commitment period that is the first RTM commitment period contained within an overlapping IFM commitment period; otherwise, when the overlap condition is not met, the costs should be allocated to RTM. The output will be = 0, if the SUC were paid for the prior Trading Day (in the case where a resource is committed across a Trading Day). |
|  | BADailyResourceRTMCommitOverlapFlag BrtuT’I’M’O’F’S’md | Indication (binary 0/1) of whether (= 1) or not (= 0) an RTM commitment period overlaps with a particular IFM commitment period and is the first (of potentially multiple) RTM periods to overlap with the IFM commitment period. The output = 1 to indicate that the overlap conditions are met. |
|  | EligibleRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif | RTM Start-Up Costs eligibility flag (0/1) for a given resource and Settlement Interval.  RTM SUC eligibility = 1;  RTM SUC ineligibility = 0. |
|  | OnForRTMPeriodSUCFlag BrtuT’I’M’O’F’S’md | Flag (0/1) indicating (when = 1) that a given resource reached or exceeded Minimum Load Energy for the relevant RTM Commitment Period O’. |
|  | OnForRTMSUCFlag BrtuT’I’M’O’F’S’mdhcif | Intermediate flag (0/1) that (when = 1) indicates RTM SUC eligibility based upon BAResourceMSGConfigurationRTMSUCFlag BrtuT’I’M’O’F’S’Ymdhcifand ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhciffor a given resource and Settlement Interval. |
|  | ReachedRTMMinimumLoadFlag BrtuT’I’M’O’F’S’Ymdhcif | Flag (0/1) indicating (when = 1) that Resource ID r operated at or above the relevant RTM Minimum Load level, where the Configuration ID Y indicates the start-up configuration in the case of a MSG resource and is NULL for a non-MSG resource. |
|  | RTMSUC\_PMinOperMW BrtuT’I’M’O’F’S’Ymdhcif | PMin Energy (in MW) of a RTM-committed resource for the specified Settlement Interval. |
|  | EligibleRTMSDC BrtuT’I’M’F’S’mdhcif | RTM Eligible Shut-Down Costs for a given pump resource and Settlement Interval. |
|  | EligibleRTMSDCFlag BrtuT’I’M’F’S’mdh | RTM Eligible Shut-Down Costs Flag (0/1) for a given [i,[ resource and Trading Hour.  Eligible IFM shut-down = 1;  Non-eligible IFM shut-down = 0. |
|  | OffForRTMSDCFlag BrtuT’I’M’F’S’mdhcif | Intermediate flag (0/1) indicating RTM Shut-Down Costs eligibility based upon RTMSDCFlag BrtuT’I’M’F’S’mdhcifand RealTimeShutDownFlag BrtF’S’mdhciffor a given pump resource and Settlement Interval.  Unit shut-down for RTM = 1;  Unit not shut-down for RTM = 0 |
|  | LoadMeterValue BrtF’S’mdhcif | Meter value for a given Participating Load (Pump or Pump-Storage) resource and Settlement Interval when pumping costs or pump shutdown costs are present. |
|  | EligibleIFMTC BrtuT’I’M’F’S’mdhcif | Eligible IFM Transition Costs for a given resource and Settlement Interval. |
|  | EligibleRUCTC BrtuT’I’M’F’S’mdhcif | Eligible RUC Transition Costs for a given resource and Settlement Interval. |
|  | EligibleRTMTC BrtuT’I’M’F’S’mdhcif | Eligible RTM Transition Costs for a given resource and Settlement Interval. |
|  | BASettlementIntervalResourceOKtoPayTCFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif | A flag output (0/1) that (when = 1) indicates (a) when a transitioning MSG resource has met the requirement (for TC to participate in BCR) that the resource be in its “From” configuration for at least one Settlement Interval of its transition notification period and (b) when, for a particular Settlement Interval of its Transition Period, the resource is at its “To” configuration (with the satisfying of both conditions determined from the resource’s PMin and meter input values). The output is provided for a given resource and Settlement Interval. |
|  | BAResourceMSGConfigurationTC\_PMinRealTimeOnFlag BrtuT’I’M’O’F’S’Ymdhcif | Flag (0/1) that (when = 1) indicates that the specified resource operated at the relevant PMin level and within the associated Tolerance Band. The output is provided for a given Settlement Interval. |
|  | BASettlementIntervalResourceToConfigIDPMinOperMW BrtuT’I’M’O’F’S’Ymdhcif | The value (in MW) of the PMin value associated with the “To” configuration of a MSG resource that is expected to be transitioning from another MSG configuration (i.e., the “From” configuration) in a given Settlement Interval. |
|  | BAResourceMSGConfigurationTC\_FlagExists BrtuT’I’M’O’F’S’Ymdhcif | Flag (0/1) that (when = 1) indicates that qualified MSG Transition Costs exist in either IFM, RUC, or RTM for a given resource and Settlement Interval. |
|  | BADailyResourceFromConfigurationOnNotificationPeriodFlag BrtuT’I’M’O’F’S’Y’’Ymd | A flag output (0/1) that (when = 1) indicates when a transitioning MSG resource has met the requirement (for TC to participate in BCR) that the resource be in its “From” configuration for at least one Settlement Interval of its transition notification period (with the satisfying of the requirement determined from the resource’s PMin and meter input values). The output is provided for a given resource and Trading Day. |
|  | FromConfigurationOnFlagCount BrtuT’I’M’O’F’S’Y’’Ymd | A count (as an integer value) of the number of Settlement Intervals for a particular Trading Day where a transitioning MSG resource is in its “From” configuration during a transition notification period. The output is provided for each MSG resource and Trading Day. |
|  | FromConfigurationOnFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif | A flag output (0/1) that (when = 1) indicates a transitioning MSG resource is in its “From” configuration for the specifed Settlement Interval of the resource’s transition notification period and the given Trading Day. |
|  | OnForFromTransitionFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif | A flag output (0/1) that (when = 1) indicates a transitioning MSG resource is in its “From” configuration for the specifed Settlement Interval of the resource’s transition notification period and the given Trading Day.  The currently specified output and output FromConfigurationOnFlag BrtuT’I’M’O’F’S’Y’’Ymdhcif are the same, except that their Y’’ and Y attribute position assignments have been swapped. |
|  | BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif | The meter output (in MWh) of a CAISO-committed MSG resource that has received a MSG Configuration transition notification. The output is valid for all Settlement Intervals of the resource’s MSG Configuration transition notification period as well as its MSG Configuration transition period. |
|  | BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue\_V BrtuT’I’M’F’S’Xmdhcif | The meter output (in MWh) of a CAISO-committed MSG resource that has received a MSG Configuration transition notification. The output reflects the results of a query output. As the output is only available during the calculation, for long-term storage it is transferred to charge type BASettlementIntervalResourceTransitionNotificationPeriodGenMeterValue BrtuT’I’M’F’S’Xmdhcif. The output is valid for all Settlement Intervals of the resource’s MSG Configuration transition notification period. |
|  | BASettlementIntervalResourceFromConfigIDPMinOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif | The value (in MW) of the PMin value associated with the “From” configuration of a MSG resource that is expected to transition to another MSG configuration (i.e., the “To” configuration). The output is provided for each given Settlement Interval. |
|  | BASettlementIntervalResourceFromConfigIDPMaxOperMW BrtuT’I’M’O’F’S’XY’’Ymdhcif | The value (in MW) of the PMax value associated with the “From” configuration of a MSG resource that is expected to transition to another MSG configuration (i.e., the “To” configuration). The output is provided for each Settlement Interval. |
|  | BASettlementIntervalResourceFromConfigTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif | A flag output (0/1) that (when = 1) identifies a particular Settlement Interval of a given Trading Day as belonging to a MSG resource’s transition notification period.  The currently specified output and input BASettlementIntervalResourceMSGTransitionNotificationPeriodFlag BrtuT’I’M’O’F’S’XY’’Ymdhcif convey the same information, except that their Y’’ and Y attribute position assignments have been swapped. |
|  | BADailyRMRResTempFlag BrtuT’I’M’O’F’S’Ymd | RMR resource indicator |
|  | RMRMLCAdj BrtYmdhcif | OC and MMA minimum load cost adjustment for RMR resources or RMR MSG configuration level |
|  | IFMRMRResMLCAdj Brtmdhcif | OC and MMA minimum load cost adjustment for RMR resources or RMR MSG configuration level in IFM. |
|  | RTMNonMultiStageRMRMLCAdj BrtYmdhcif | RTM RMR MLC Adjustment for non-MSG. |
|  | RTMMultiStageRMRMLCAdj BrtYmdhcif | RTM RMR MLC Adjustment for MSG. |
|  | RTM\_RMRMLCAdj BrtYmdhcif | OC and MMA startup cost adjustment for RMR resources or RMR MSG configuration level in RTM.  Accounts for negative MLC basis, whereas OC and MMA are natively positive cost adjustments.  Negative MLC can happen for shutdown or dispatch from a higher (cost) configuration to lower (cost) configuration from IFM to RTM, |
|  | RMRSUCAdder BrtYmd | OC and MMA startup cost adjustment for RMR resources or RMR MSG configuration level |
|  | RMRCommitPeriodEligibleSUCFlag BrtO’Ymdhcif | SUC eligibility flag for RMR resource/MSG configuration per settlement interval for a commitment period. |
|  | RMRCommitPeriodEligibleSUCTotIntervals BrtO’Ymd | Total intervals of eligible SUC flag per commitment period |
|  | RMRCommitPeriodEligibleSUCRate BrtO’Ymd | Rate of RMR SUC adjustment per commitment period per MSG configuration. |
|  | RMR\_SUCAdj BrtO’mdhcif | RMR SUC adjustment per commitment period per resource per eligible SUC interval. |
|  | RMR\_RTMSUCAdj BrtO’mdhcif | Applicable RTM cost adjustment for RMR resource per settlement interval of the commitment period. |
|  | RMREligibleTCFlag BrtO’Y”Ymdhcif | Eligible TC Flag for RMR resource/MSG configuration per settlement interval. |
|  | CommitPeriodEligibleTCTotIntervals BrtO’Y”Ymd | Total intervals per commitment period (per day) of eligible TC flags. |
|  | CommitPeriodEligibleTCRate BrtO’Y”Ymd | RTM cost adders rate per settlement interval of the commitment period (and MSG configuration) per eligible RTM SUC flag interval. |
|  | RMR\_TCAdj BrtO’mdhcif | Applicable TC cost adjustment for RMR resource per settlement interval of the commitment period. |
|  | JOUChildResourceFlag rmd | Indicates whether a resource r is a JOU (child) resource. |
|  | JOUParentChildAssociationFlag rj’’md | Associates resource r to its JOU parent j’’ ID. |
|  | JOUParentChildSettlementIntervalStartUpNotificationPeriodFlag rj’’O’XYmdhcif | Startup notification for a JOU parent and child together with commitment period ID, trade start X that is relevant for commitment cost check, and the NULL configuration ID. |
|  | JOUChildSettlementIntervalAdvisoryShutdownUIEFlag rmdhcif | Inherited advisory shutdown UIE flag value from JOU parent to JOU child resource r. |
|  | JOUParentSettlementIntervalAdvisoryShutdownUIEFlag j’’mdhcif | Advisory shutdown UIE flag value for a JOU parent. |
|  | JOUParentSettlementIntervalExpectedEnergyUIEDifference j’’mhcif | Expected Energy UIE difference rolled up to JOU parent level from child level values of BASettlementIntervalResourceExpectedEnergyUIEDifference BrtuT’I’M’F’S’mdhcif. |
|  | JOUParentSettlementIntervalCumulativeUIEPMinTestLimit j’’mdhcif | JOU parent Pmin threshold when there is advisory shutdown. |
|  | JOUParentDispatchIntervalAdvisoryShutdownFlag j’’mdhcif | JOU parent advisory shutdown intervals, rolled up from JOU child level. |
|  | JOUChildMLC\_PMinRealTimeOnFlag rmdhcif | Inherited by a child from its JOU parent. When it has a value of 1, means the physical resource has reached or exceeded the Pmin less tolerance band. |
|  | JOUParentMLC\_PMinRealTimeOnFlag j’’mdhcif | When it has a value of 1, indicates the JOU parent’s meter has reached or exceeded the Pmin less tolerance band. |
|  | JOUParentMLC\_PMinRealTimeCheckFlag j’’mdhcif | When it has a value of 1, indicates the JOU parent will be subject to meter check about Pmin. |
|  | JOUParentPMinLessToleranceBandQuantity j’’mdhcif | JOU parent value for Pmin less tolerance band. |
|  | JOUParentRealTimePMinOperMWhQuantity j’’mdhcif | JOU parent value in MWh for its Pmin in real time as needed for commitment cost qualifications. |
|  | JOUParentRealTimePMinOperMW j’’mdhcif | JOU parent value in MW for its Pmin in real time as needed for commitment cost qualifications. |
|  | JOUChildOffForStartUpFlag rO’XYmdhcif | Inherited from JOU parent. When it has a value of 1, indicates the resource is deemed to have been off prior to a commitment period to qualify for startup cost. |
|  | JOUParentOffForStartUpFlag rj’’O’XYmdhcif | When it has a value of 1, indicates the JOU parent is deemed to have been off prior to a commitment period to qualify for startup cost. |
|  | JOUParentSettlementIntervalStartUpNotificationPeriodGenMeterValue j’’Xmdhcif | JOU parent meter value needed for commitment cost qualfications. |
|  | JOUParentSUC\_NotificationPeriodPMinOperMWhQuantity j’’O’XYmdhcif | JOU parent Pmin (in MWh) value needed for commitment cost qualfications. |
|  | JOUParentToleranceBand j’’mdhcif | Resource tolerance band around Pmin for commitment cost qualifications. |
|  | JOUParentGenMeterValueQuantity j’’mdhcif | JOU Parent meter value, assigned from submitted value. |
|  | JOUChildReachedRTMMinimumLoadFlag rO’mdhcif | Inherited from JOU parent. When it has a value of 1, indicates the resource is deemed to have been have reached Pmin for minimum load cost. |
|  | JOUParentReachedRTMMinimumLoadFlag rj’’O’mdhcif | When it has a value of 1, indicates the resource is deemed to have been have reached Pmin for minimum load cost. |
|  | JOUParentRTMSUC\_PMinOperMWhQuantity j’’O’mdhcif | Pmin in MWh value for startup cost qualification. |
|  | JOUParentRTMSUCFlag j’’O’mdhcif | Commitment period indicator for startup cost at JOU parent level. |
|  | JOUParentChildRTMSUCFlag rj’’O’mdhcif | Commitment period indicator for startup cost for a JOU child and its parent |

# Charge Code Effective Dates

| Charge Code/  Pre-calc Name | Document Version | Effective Start Date | Effective End Date | Version Update Type |
| --- | --- | --- | --- | --- |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.0 | 04/01/09 | 03/31/09 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.1 | 04/01/09 | 03/31/09 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.2a | 04/01/09 | 07/31/10 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.2b | 08/01/10 | 12/07/10 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.3 | 12/08/10 | 04/09/12 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.4 | 04/10/12 | 04/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.5 | 05/01/14 | 04/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.5a | 05/01/14 | 04/30/14 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.6 | 10/01/14 | 09/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.7 | 05/01/14 | 04/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.8 | 10/01/14 | 09/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.9 | 10/01/16 | 09/30/16 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.10 | 2/01/17 | 01/31/17 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.11 | 05/01/14 | 09/30/14 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.12 | 10/01/14 | 02/09/15 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.12a | 02/10/15 | 09/30/16 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.13 | 10/01/16 | 09/30/16 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.13a | 10/01/16 | 01/31/17 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.14 | 02/01/17 | 01/31/17 | Documentation Edits and Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.14a | 02/01/17 | 01/31/17 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.15 | 02/01/17 | 4/30/2018 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.16 | 05/01/18 | 12/31/19 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.17 | 1/1/20 | 01/31/21 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.18 | 2/1/21 | 5/02/22 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.19 | 5/03/22 | 5/31/22 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.20.0a | 6/1/22 | 11/30/22 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.21.0a | 12/1/22 | 7/31/24 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.22.0a | 8/1/24 | 7/31/24 | Documentation Edits Only |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.22.1 | 8/1/24 | 4/30/26 | Configuration Impacted |
| Pre-Calc Start-Up Cost & Minimum Load Cost Pre-calculation | 5.23.0a | 5/1/26 | Open | Documentation Edits Only |