

Business Practice Manual for Settlements & Billing

Version 30

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Revision History

Version	PRR	Date	Description
30	1692	6/29/2026	• Updates to include DAAS Charges
29	1427	2/1/2022	• Update section 4.2.2 to match Business Rule 5.3 from the CC 550 551 Ferc Fee Settlement BPM
28	1397	11/4/2021	• Edits for Tariff Amendment Adjusting the Meaning of business day (ER21-2854-000)
27	1427	11/17/2020	• Add an Attachment F in the attachments section.
26	1298	8/28/2020	• Edits for Market Settlement Timeline Transformation initiative effective 1/1/2021, which eliminated certain settlement statements effective trading date 1/1/2021, including Recalculation Settlement Statements T+55B, T+9M, T+18M, T+33M and T+36M. Please note that, due to the nature of the settlement cycle, which involves recalculating settlements afterwards as additional information becomes available, through 2023 CAISO will continue to issue some settlement statements from the previously effective settlement timeline. For additional information about the previously effective timeline and related rules, see version 25 of this BPM. • Removed exemption from Daily Initial Runs under section 3.1. • Change DRS to MRI-S (Market Results Interface – Settlements). The former was already decommissioned.
25	1234	2/6/2020	• Clarification to Section 2.3.2 for Publication Date for RC Services Recalculation Statement • Clarification to Section 4.2.6 • Added Black Start Capability Invoice

Version	PRR	Date	Description
24	1197	8/28/2019	• Updates due to termination of Peak RC settlement and invoicing
23	1163	5/29/2019	• Correction to the naming of RC Services and HANA Services Statement, Invoice and Billing Runs • Addition of RC Services Recalculation runs
22	1148	3/18/2019	• Updated descriptions for two primary bill determinants to reflect new mapping requirements: DispatchIntervalCheckedOutInterchangeQuantity BrtEuT'I'Q'M'AA'R'pPW'Qd'Nz'OVvHn'L'qq'mdhcif DispatchIntervalCheckedOutDynamicInterchange Quantity BrtEuT'I'Q'M'AA'R'pPW'Qd'Nz'OVvHn'L'qq'mdhcif • Updated Outputs to the Estimation for Meter Data to include CRUSB_DispatchIntervalCheckedOutInterchange QuantitySourceFlag
21	1099	10/24/18	• Updates to include RC Services and HANA Charges • Correction of language in Section 4.2.4 • Removed Dispute Process reference in Section 9 • Removed references to T+35M
20	1076	7/24/18	Updates made to reflect changes related to tariff clarification amendment: • Exclusion of the Real-Time Market financial value and The allocation of RTM Bid Cost Up-lift adjustment from the Daily Initial Market Statement • Meter estimation for system resources
19	993	5/26/17	Content updates to accommodate PRR 993: • To assist in the timely review of the dispute, clarifications to dispute sections regarding the type of information the SC should provide as well as the manner in which the ISO responds
18	974	2/13/17	Content updates to accommodate PRR 974: • Revisions address Tariff Amendment replacing the T+35 month statement with a T+33 month statement, and dispute timeline extension to 22 business days. These processing changes will be

Version	PRR	Date	Description
			effective May 3, 2017 with a two month transition whereby T+35 month statements will be issued through July 2014 trade month, and the first T+33 month statement will be August 1, 2014. • Replaced OMAR references with the new/generic "SQMDS" to accommodate parallel OMAR and MRI-S operations and the eventual OMAR decommission.
17	926	5/12/16	Content updates to accommodate PRR 926: • Added new processing requirements to incorporate Transferred Frequency Response (TFR) settlement and invoicing principles
16	865	9/23/15	Content updates to accommodate PRR 865: • Updated dispute deadline for theT+35M statement in section 2.3.5.1.1 to be consistant with Tariff
15	855	7/23/15	Content updates to accommodate PRR 855: • Added new processing requirements to incorporate Peak RC settlement and invoicing principles • Replacement reference to CAS system with ITS system. • Clarified resource types subject to the meter estimation process. • Added settlement documentation reference matrix in Section 9
14	769	8/5/14	Content updates to accommodate PRR 769: • Meter data estimation changes in section 3.6 to accommodate EIM resources.
13	711	4/28/14	Content updates to accommodate PRR 711: • Meter data estimation changes in section 3.6 resulting from FERC Order 764 • Removal of references to SaMC • Removed duplicate definitions table for configuration subscripts; master list in Design Standard and Conventions technical document.
12	667	4/24/13	Content updates to accommodate PRR 667: • Remove all references associated with Compliance system inputs.

Version	PRR	Date	Description
			• Adjusted content of Daily Initial Run to delete reference to Regulation CC exclusions. These CCs have been included in the daily initial run since regulation integration occurred with the November 2012 release, effective 12/1/2012. • Removed incorrect tariff section cross reference.
11	641	4/1/13	Content updates to accommodate PRR 641: Removed all references to Attachment A, D and E. These BPM artifacts are being/have been retired as the corresponding information is either obsolete (Attachment A) or provided through other sources (Attachment D and E), Tariff references previously captured in Attachment E have been moved to Attachment B
10	592	8/27/12	Content updates to accommodate PRR 592: • Statement of settlements data retention period policy incorporated into section 2.1.1, 2.1.3, and 2.2.1. • SPTC clarifications: o to section 2.3.6.2 regarding market transactions included in Wednesday invoice on those calendar weeks that include a Monday holiday. o to section 3.6 regarding meter data estimation on T+12B Recalculation statement.
9	461/ 471	9/15/11	Content updates to accommodate PRR 461 and 471: • New process requirements that reflect principles in FERC Order 741 – Credit Reform. • New process requirements that reflect principles in the draft final proposal for the Settlement Processing Timeline Change (SPTC) initiative. • Added new processing requirements to incorporate NERC/WECC information statement, settlement and invoicing principles for assessment year 2014. • Updates to reflect integration of the Bill Determinant Matrix within the configuration output file.

Version	PRR	Date	Description
			• Language edits to clearly show that the estimated meter data adder does not apply to generating resources.
8	441	5/9/11	Content updates to accommodate PRR 441: • Added new processing requirements to incorporate NERC/WECC settlement and invoicing principles. • Updated Exhibit 8-2 to redefine notation for B' and to include additional notations as specified in the SaMC Design Standards and Conventions.
7	174	8/1/10	Content updates to accommodate PRR 174: • Clarification provided to section 3.6 Meter Data Estimation processes for Proxy Demand Resources (PDR). • Updates to Exhibit 8-2 to include new value against Entity Component Subtype notation required for PDR implementation. Other clerical and grammar edits
6	220	5/3/10	Content updates to accommodate PRR 220: • Update to sections 2.3.5.1.1, 5.2, 5.3 and 5.4.3 to reference new Customer Inquiry Dispute and Information system (CIDI) as the replacement for the Settlements Dispute System (SDS).
5	193	4/7/10	Content updates to accommodate PRR 193: • Updates to Exhibit 8-2 to include new notation for Reference ID required for Collateral Late Payment Penalty. • Updates to Exhibit 8-2 to include missing notation for CAISO Balancing Authority Region as noted by a participant comment against PRR 193 • Updates to section 6.1.1.2 & new section 6.3.4 to reference supporting documentation for Invoice Late Payment Penalty and Collateral Late Payment Penalty.
4	91	1/1/10	Content updates to accommodate PRR 91 • Updates to Exhibit 8-2 to include new notation required for Standard Capacity Product (SCP)

Version	PRR	Date	Description
			• Updates to Exhibit 8-2 to insure attribute notation consistency with Design Standard & Convention document
3	77	11/1/09	Content updates to accommodate the remaining part of PRR 77: • Changes to various sections as a result of Payment Acceleration principles.
2	77	10/14/09	Content updates to accommodate part of PRR 77: • Clarification in daily vs. monthly settlement statements • Changes to Historic PTB definitions.
1		3/13/09	Initial version effecitive 4/1/09.

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Attachment C - PTB Charge Code Adjustment Examples (Part I and Part II)
Attachment D - Dispute Submittal Form

Attachment F - Transmission Access Charge Rates Submission Procedure and Transmission Access Charge Rates Submission template

1. Introduction

Welcome to CAISO *BPM for Settlements & Billing*. In this Introduction, you find the following information:

- The purpose of CAISO BPMs
- What you can expect from this CAISO BPM
- Other CAISO BPMs or documents that provide related or additional information

1.1 Purpose of California ISO Business Practice Manuals

The Business Practice Manuals (BPMs) developed by CAISO are intended to contain implementation detail, consistent with and supported by the CAISO Tariff, including: instructions, rules, procedures, examples, and guidelines for the administration, operation, planning, and accounting requirements of CAISO and the markets. Each Business Practice Manual is posted in the BPM Library at: http://bpmcm.caiso.com/Pages/BPMLibrary.aspx. Updates to all BPMs are managed in accordance with the change management procedures included in the **BPM for Change Management**.

1.2 Purpose of this Business Practice Manual

The *BPM for Settlements & Billing* covers the business processes associated with all of CAISO financial settlements. Specifically the BPM covers:

- An overview of the BPM

- An overview of the financial processes related to financial settlements including billing, settlements and invoicing, financial processes and clearing, emergency operations, and dispute processing
- A detailed review of the settlement calculations including a description of the approach and a listing of the formulas used in calculations
- Specific rules and processes related to RC Services and HANA settlements
- Specific rules and processes related to DAAS settlements

The provisions of this BPM are intended to be consistent with the CAISO Tariff. If the provisions of this BPM nevertheless conflict with the CAISO Tariff, the CAISO is bound to operate in accordance with the CAISO Tariff. Any provision of the CAISO Tariff that may have been summarized or repeated in this BPM is only to aid understanding. Even though every effort will be made by the CAISO to update the information contained in this BPM and to notify Market Participants and RC Customers of changes, it is the responsibility of each Market Participant or RC Customer to ensure that he or she is using the most recent version of this BPM and to comply with all applicable provisions of the CAISO Tariff.

A reference in this BPM to the CAISO Tariff, a given agreement, any other BPM or instrument, is intended to refer to the CAISO Tariff, that agreement, BPM or instrument as modified, amended, supplemented or restated.

The captions and headings in this BPM are intended solely to facilitate reference and not to have any bearing on the meaning of any of the terms and conditions of this BPM.

1.3 References

The definition of acronyms and words beginning with capitalized letters are given in the *BPM for Definitions & Acronyms*.

Please note that the variable names used in the content provided in the BPM Configuration Guides are capitalized for ease of use and are not intended to become defined terms. A description of the variable names is provided in the relevant input or output tables associated with the subject Charge Code or Pre-calculation

Other reference information related to this BPM includes:

- Other CAISO BPMs
- CAISO Tariff
- Relevant CAISO MRTU Tariff compliance filings
- Relevant Attachments

- BPM Configuration Guides

2. Settlements & Billing Overview

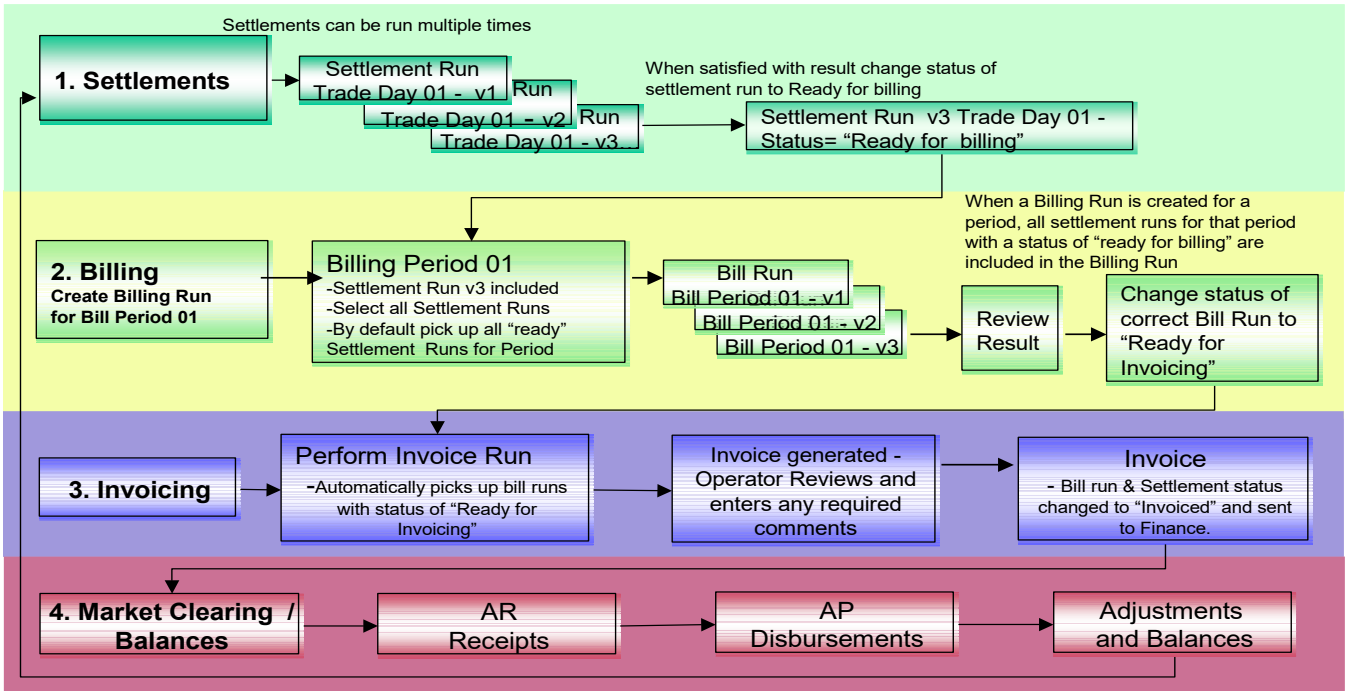
Welcome to the *Settlements & Billing Overview* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- An overview of the Settlement, Billing, Invoicing, and Financial Clearing business functions and processes
- An overview of key Settlement & Billing Principles, such as the data sources that feed the Settlements process, descriptions of the financial transaction conventions, and a summary of the Settlement calculations executed by CAISO
- An overview of the Settlement & Invoicing Cycles covering the types and schedule for publishing of Settlement Statements, the content requirements of Settlement Statements, an overview of disputes and Settlement Adjustments, and the schedule and content requirements for Invoices and Payment Advices
- Payment Calendar references

2.1 Business Functions

The Settlements business function consists of Settlements, Billing, and Invoicing processes. These three processes often referred to in combination as “Settlements,” represent three of the four components that make up the overall CAISO business function of Settlements and market clearing. The fourth and last component of this business function is the market clearing function (or Financial Clearing), plus any associated processes. A diagram of these processes is provided in Exhibit 2-1 below, with the supporting detail presented throughout this BPM.

Exhibit 2-1: The Settlements and Market Clearing Business Functions



2.1.1 Settlement Process

Settlement is the process during which the calculation of charges and payments are executed using a wide variety of inputs in order to generate the content for Business Associate statements for CAISO Markets and transmission related activities. This process is executed through a Settlement Run. During a Settlement Run, inputs are applied to calculation formulas identified in Configuration Guides to generate detailed charges and matching payments, which create the needed outputs for publishing Settlement Statements. A Settlement Run also creates the outputs that are needed for executing the Billing process, generating and publishing Invoices and Payment Advices, and executing the Financial Clearing process.

The calculation logic for determining charges and payments to Business Associates are included in this BPM as Configuration Guides for each defined Pre-calculation or Charge Code calculation. In addition to the calculation formulas, Configuration Guide content provides background information, business rules, as well as both input and output specifications for all calculations executed within a Settlement Run.

Internally reviewed and approved calculation results are used to generate and publish to Business Associates the appropriate Settlement Statement in an XML file format. Multiple versions of a Settlement Statement for a Trading Day are possible and published according to the existing (approved) CAISO Payment Calendar. Each Settlement Statement contains details for only one Trading Day and includes all information needed by Business Associates to validate their calculations. The XML file follows a structure specified in the **Settlements Interface**

Specification for Scheduling Coordinators document found on CAISO web. In addition to the Settlement Statement output XML files, a **configuration output file** (also in XML format) is provided. This file contains the configuration formulas and Bill Determinants used in all calculations. This file is regenerated and published any time there is a change to a configured equation. The Settlement statement files are available for download for a period of 45 calendar days from the publication date via a secure web interface. Please see Section 9 of this BPM for links to the **Settlements Interface Specification for Scheduling Coordinators** and the **configuration output file**.

2.1.2 Billing Process

Billing is the process where all the charges associated with one or more selected Settlement Runs in a Bill Period are summed to provide totals in "invoice ready" format. This process is executed through a Billing Run and is transparent to Business Associates as there are no outputs provided directly to them as a result of this process.

This step provides for the summation of specified Settlement Run results into the format ultimately needed for validation and Invoicing. This summation process is executed at specified hierarchy levels after all the Settlement Run results are verified and used to generate Settlement Statements.

Outputs from the Billing process are inputs to the Invoicing process, and subsequently to the market clearing system. The "invoice ready" format consists of Business Associate and CAISO totals for the Bill Period and is cross-referenced back to the Settlement Runs that are included in that Billing Run.

2.1.3 Invoicing Process

Invoicing is the process in which the totals associated with one or more selected Billing Runs for a designated Invoice Type are used to produce Invoices and Payment Advices with the same due date (also known as a Payment Date). An Invoice is represented by a net positive amount and a Payment Advice is represented by a net negative amount for the total of all items and Bill Periods included in the output file. Only those Billing Run results that are reviewed and approved by a Settlement Operator are included in an Invoicing Run.

Like the Settlement Statements, Invoices and Payment Advices are produced by the Settlement system in a defined XML file format that contains full supporting detail needed for validation. Business Associates can download these XML files via a secure web interface for a period of 45 calendar days from the publication date. A printable version of the Invoice and Payment Advice are made available to Business Associates via the same interface.

In addition to the XML Invoice and Payment Advice file outputs, the Invoicing process provides another XML output file needed only for CAISO Accounting and Financial Clearing purposes. Specifically, the Invoicing process provides all calculation details that generate matching General Ledger ("GL"), Accounts Payable ("AP"), and Accounts Receivable ("AR") transaction balances. Included in the output are those calculation details that can be used to determine that CAISO maintains a neutral position across all planned cash receipts and disbursements.

2.1.4 Financial Clearing Process

This business function is completed by the receipt of monies against the Invoices and then matching the disbursement of those monies to the Payment Advices. The key components of the Financial Clearing process are:

- The receipt of inputs from the Invoicing process to create GL, AR, and AP amounts generated from specific line items
- Confirmation of CAISO revenue neutrality
- Processing of Payments through the CAISO Clearing Account on the Payment Date as prescribed by the CAISO Payment Calendar
- In the event of a default by a CAISO debtor, providing a PTB Direct input for a Financial Adjustment to Settlements to initiate the Shortfall Allocation calculation
- In the event of a payment on a default by a CAISO debtor, providing a PTB Direct input for a Financial Adjustment to Settlements to initial the Shortfall Receipt Distribution calculation
- Providing open account balances and any additional PTB Direct inputs for Financial Adjustments (such as Interest) to Settlements

2.2 Settlement & Billing Principles

This section presents the data sources, financial transaction conventions and currency, and calculation of settlements.

2.2.1 Data Sources

In order to execute the Settlement calculation rules and processes as defined, the Settlements system provides a mechanism that allows for the identification, control, scheduling, receipt, and validation of the various inputs. Transactional inputs are received from several upstream CAISO systems, including, but not limited to:

- Market systems such as the Day-Ahead Market, which includes the Market Power Mitigation (MPM), Reliability Requirement Determination (RRD), Integrated Forward Market (IFM), and the Residual Unit Commitment process (RUC). Market systems also

cover the Real-Time Market, which includes MPM, RRD, the Hour-Ahead Scheduling Process (HASP), Short Term Unit Commitment (STUC), Real-Time Pre-Dispatch (RTPD), Fifteen Minute Market (FMM), and the Real-Time Economic Dispatch (RTED)

- Metering systems, such as the Meter Data Acquisition System (MDAS) or the State Estimator
- Legacy systems such as the Balance of Business System (BBS)
- The market clearing system
- Market Results Interface (MRI) for Settlements
- Pass Through Bill (PTB) data

Inputs may also reference standing data that either source from the CAISO Masterfile or are stored directly within the Settlement system.

As stated throughout this BPM, each Business Associate receives its own data (as well as all market-wide reference or standing data) associated with inputs in its Settlement Statement. The identification of the all inputs needed for each Pre-calculation and Charge Code is included in this BPM under the relevant Configuration Guide.

A Bill Determinant matrix that is integrated within the configuration output file posted on the CAISO website provides a listing of Bill Determinant names and a mapping of the Configuration Guide variable name to the Bill Determinant name. The configuration output file is available for download via the secure web interface for a period of 45 calendar days from the associate publication date. The **Settlements Interface Specification for Scheduling Coordinators**, a technical document also found on CAISO website, provides the XSD and XML information required by application programmers to download and process the configuration output file as well as all other settlement system outputs.

2.2.2 Financial Transaction Conventions & Currency

Consistent with Section 11.1.3 of the CAISO Tariff, all Payments to and Charges from CAISO must be made by Fed Wire as detailed in Section 6 of this BPM. All amounts owing to a Business Associate are presented as a negative Settlement Amount and such entities are sometimes referred to as CAISO Creditors. All amounts owing from a Business Associate (due to CAISO) are presented as a positive Settlement Amount and such entities are sometimes referred to as CAISO Debtors.

2.2.3 Calculation of Settlements

CAISO is responsible for calculating and settling all transactions as detailed in the CAISO Tariff. The specific calculation logic used to accomplish this is detailed in each BPM Configuration

Guide. **Attachment B**, the **Charge Group & Parent Group Specification** provides all the Charge Codes (and supporting Pre-calculations) that are calculated by the Settlements system by effective date. A cross-reference to the CAISO Tariff section heading is also provided. Please see Section 9 of this BPM for a link to this document.

2.3 Settlements & Invoicing Cycles

The Settlement Cycle is the specific sequence of calendar days associated with various Settlement, Billing, and Invoicing processes that cover the publication requirements for Settlement Statements, Invoices/Payment Advices, the rules for funds transfer, and the timing for dispute submittal. These timelines are described in CAISO Tariff Section 11.29 and are further described in this BPM.

The deadlines for these events are expressed using the term 'business day.' As noted in some subsections of Section 11.29, this term differs from the defined term "Business Day" because it encompasses all days on which the CAISO is open for business, including certain days that are recognized as federal holidays. (The defined term "Business Day," which is used to calculate other CAISO deadlines not addressed here, excludes all recognized federal holidays.) Three federal holidays are regular operation days for the CAISO: Juneteenth, Columbus Day, and Veterans Day. These three days are business days, and are not CAISO Holidays, for purposes of issuing settlement statements and invoices, and for calculating deadlines for submitting payment or disputes. The current list of CAISO Holidays, which are not business days, is as follows:

CAISO Holidays
New Year's Day
Martin Luther King Jr. Day
Presidents' Day
Memorial Day
Independence Day
Labor Day
Thanksgiving
Day after Thanksgiving
Christmas Day

The portion of the Settlements Cycle regarding the Settlements process covers the following:

- The types of Settlement Statements to be issued

- The schedule for publishing Settlement Statements
- The contents of the Settlement Statements
- The schedule for submitting disputes against a Settlement Statement and the scope of information against which a dispute can be submitted
- The processing rules around execution of Settlement Reruns or Settlement Adjustments

The portion of the Settlements Cycle regarding the basis for billing and payments, also called the Invoicing Cycle, covers the following:

- The schedule for publishing Invoices/Payment Advices against Settlement Statements
- The content of the Invoices/Payment Advices

2.3.1 Types of Settlement Statements

There are two generic types of Settlement Statements, an Initial Settlement Statement and a Recalculation Settlement Statement. The first issuance of the Initial Settlement Statement is the first statement published by CAISO of the calculation of the Settlements and allocation of the charges for a given Trading Day. A Recalculation Settlement Statement is a restatement/revision/true-up against an invoiced version of the Initial Settlement Statement or a previous Recalculation Settlement Statement. A Recalculation Settlement Statement is published after the Initial Invoice/Payment Advice for the relevant Bill Period. There are only three factors that distinguish these two types:

- The names of the statements, including version reference
- The timing of publication in relation to the Invoicing process, meaning the calendar day on which it publishes
- The inclusion of Previous and Net Billable Quantities, Billable Prices, and Settlement Amounts

The sections that follow provide the details with which the differences between the two statement types can be quantified. All other aspects of the Settlement Statements are the same, including the content structure and the fact that each version published contains calculation result sets based on the most current data available as of the time of issuance.

Initial and Recalculation Settlement Statements can be regenerated multiple times using updated data resulting in a new version of the Settlement Statement. The Initial Settlement Statement for a given Trading Day can only be regenerated prior to the publication of the Invoice which contains the Trading Day associated with that Initial Settlement Statement. After the Invoice is published, any subsequent version of the Settlement Statement for the associated Trading Day is a version

of the Recalculation Settlement Statement. Each regeneration of a given Settlement Run Type (please see section 3.1 of this BPM for defined Settlement Run Types) for either Initial or Recalculation Settlement Statements has a unique version numbers that is incremented by one against the version number (for the same Settlement Run Type) of the immediately preceding published Initial or Recalculation Settlement Statement for the same Trading Day.

2.3.2 Schedule for Settlement Statement Publication

Please note that the Market Settlement Timeline Transformation initiative eliminated certain settlement statements effective trading date 1/1/2021, including Recalculation Settlement Statements T+55B, T+9M, T+18M, T+33M and T+36M. Please note that, due to the nature of the settlement cycle, which involves recalculating settlements afterwards as additional information becomes available, through 2023 CAISO will continue to issue some settlement statements from the previously effective settlement timeline. For additional information about the previously effective timeline and related rules, see version 25 of this BPM.

On T + 9 business days (B) from the relevant Trading Day, CAISO publishes the **Initial Settlement Statement** to each Business Associate for each Trading Day (T) for all Settlement Periods in that Trading Day or Trading Month.

CAISO publishes a **Recalculation Settlement Statement** to each Business Associate for each Trading Day on T + 70B from the relevant Trading Day covering all Settlement Periods in that Trading Day or Trading Month.

Recalculation Settlement Statements may also publish on T + 11 Months (M), T + 21M, and T + 24M. These are optional Settlement Statements and will post only if necessary. Statements published at T + 11M, T + 21M, and T + 24M are categorized as Settlement Statement Reruns in order to exclude FERC Fee charges from the re-settlement. CAISO will publish all optional statements in accordance with the CAISO Payments Calendar and will provide advance notice of publication via a Market Notice.

Unscheduled Recalculation Settlement Statements may also publish between T + 11M and T + 21Min order to correct a CAISO processing error with significant fiscal impact. CAISO will provide 30 days advance notice of the unscheduled publication via a Market Notice. The specific criteria that must be met in order publish an unscheduled statement are:

- The issue has a $1,000,000 per day fiscal market impact for a given Trading Day, and
- The issue is a the result of a CAISO processing error, and
- The issue was identified within the respective settlement dispute window

After the T + 24M sunset, Recalculation Settlement Statements may be required for additional Settlement Statement Reruns as directed by CAISO Governing Board or pursuant to a FERC order.

From both a technical and business process perspective, a Recalculation Settlement Statement can only be generated and published once a version of an Initial Settlement Statement for the associated Trading Day has been published and included on an Invoice or Payment Advice.

The Settlement Amounts presented on these Statements represent the financial obligations owing to or from a Business Associate.

The table below provides a summary of the publication dates for the various Settlement Statement types:

Settlement Statement Types	**Publication Date**
Initial Settlement Statement T + 9B (effective trade date 1/1/2021)	T + 9B
Initial Settlement Statement T + 3B *(retired trade date 12/31/2020)*	T + 3B
Recalculation Settlement Statement T + 12B *(retired trade date 12/31/2020)*	T + 12B
Recalculation Settlement Statement T + 55B *(retired trade date 12/31/2020)*	T + 55B
Recalculation Settlement Statement T + 70B (effective trade date 1/1/2021)	T + 70B
Recalculation Settlement Statement T + 9M *(retired trade date 12/31/2020)*	T + 9M (T + 194B)
Recalculation Settlement Statement T + 11M (effective trade date 1/1/2021)	T + 11M (T + 234B)
Recalculation Settlement Statement T + 18M *(retired trade date 12/31/2020)*	T + 18M (T + 383B)
Recalculation Settlement Statement T + 21M (effective trade date 1/1/2021)	T + 21M (T + 446B)
Recalculation Settlement Statement T + 24M (effective trade date 1/1/2021)	T + 24M (T + 512B)
Recalculation Settlement Statement T + 33M *(effective trade date 8/1/2014)* *(retired trade date 12/31/2020)*	T + 33M (T + 693B)
Recalculation Settlement Statement T + 36M *(retired trade date 12/31/2020)*	T + 36M (T + 759B)

Settlement Statement Types	Publication Date
Recalculation Settlement Statement - unscheduled	Communicated by Market Notice 30 days prior
Black Start Capability Initial Settlement Statement	Published monthly
Black Start Capability Recalculation Settlement Statement	Published monthly
NERC/WECC Information Statement	Communicated by Market Notice (*effective calendar year 2013 for NERC/WECC Charge Assessment Year 2014 forward*)
NERC/WECC Initial Statement	No later than August 31 for each calendar year in accordance with FERC guidelines.
NERC/WECC Recalculation Statement	Within 15 business days after receipt of the WECC invoice to the CAISO.
RC Services Informational Statement	No later than October 30 of each calendar year.
RC Services Initial Statement	First business day of the assessment year.
RC Services Recalculation Statement	First business day of the assessment year or as needed based on customer onboarding outside of April 1 timeline.
HANA Initial Statement	Published monthly as needed based on service start date to those RC Customers with HANA services.
DAAS Initial Statement	Published monthly as needed based on service start date to those EDAM Entities with DAAS services.
TFR Initial Statement	Within 10 business days after receipt of the invoice for Transferred Frequency Response (TFR) Charges to the CAISO
TFR Recalculation Statement	Within 15 business days of the date the initial TFR invoice was issued by the CAISO

2.3.3 Settlement Statement Granularity

Settlement Statements can be generated for a single Trading Day or for an entire Trading Month for Charges Codes with varying granularity requirements that are defined by tariff. In accordance with the CAISO Payment Calendar, Initial Settlement Statements and Recalculation Settlement Statements are generated for each Trading Day (a 'daily' statement), as well as a Trading Month (a 'monthly' statement). Daily statements include only those Charge Codes whose Settlement Amount calculation granularity is no greater than daily, and monthly statements include only those Charge Codes whose Settlement Amount calculation granularity is no less than monthly (i.e., a value that represents the entire Trading Month). Monthly statements are published on the same calendar day as the statement for the last Trading Day of a Trading Month.

2.3.4 Content of Settlement Statements

Three XML files make up the content of any version of a published Initial or Recalculation Settlement Statement. These files are:

1. A Settlement Amount File
2. A Business Associate (BA) Bill Determinant File
3. A common CAISO Bill Determinant File

The content of these files reflects transactional data for only one Trading Day or Trading Month unless otherwise specified by the calculation rules for a given Charge Code and are detailed in the **Settlements Interface Specification for Scheduling Coordinators.**

Each published version of any Settlement Statement for a Trading Day includes the standard hierarchy levels detailed below. The **Charge Group & Parent Charge Group Specification** in **Attachment B** provides details regarding the granularity for each Charge Code Settlement Amount, indicating if it is included in the daily or monthly Settlement Statement.

- A Settlement total, which is the total Current Settlement Amount payable or receivable for all Charge Codes and all Settlement Periods included in the statement at both a Business Associate and CAISO total level
- A Parent Charge Group total, which is the total Current Settlement Amount payable or receivable for all Charge Codes and all Settlement Periods in each Parent Charge Group at both a Business Associate and CAISO total level
- A Charge Group total, which is the total Current Settlement Amount payable or receivable for all Charge Codes and all Settlement Periods in each Charge Group at both a Business Associate and CAISO total level
- A Charge Code total, which is the total Current Settlement Amount payable or receivable for each Charge Code in all Settlement Periods on the Settlement Statement at both a Business Associate and CAISO total level
- A Charge Code Interval total, which is the total Current Settlement Amount payable or receivable for each Charge Code in each Settlement Period on the Settlement Statement at both a Business Associate and CAISO total level including any PTB Charge Code Adjustments. PTB Charge Code Adjustment groupings are explained in more detail in Section 3.3.5.3 of this BPM
- A Charge Code Interval sub-total, which is the total Current Settlement Amount payable or receivable for each Charge Code in each Settlement Period on the Settlement Statement at a Business Associate level excluding any PTB Charge Code Adjustments

- A Charge Code Interval Detail total, which presents the total Current Settlement Amount payable or receivable for each Charge Code in each Settlement Period plus the associated current Billable Quantity and current Billable Price (where appropriate for the Charge Code) at a level that includes all attributes relevant to the Charge Code, such as Business Associate ID, Location ID, Energy Type, Market Type, etc.
- All Intermediate and Raw Bill Determinants used in the calculation of the Charge Code Interval Detail as specified in the input and output tables provided against each Charge Code in the BPM Configuration Guides.
- Additional Settlement Statement outputs as specified in the **Settlements Interface Specification for Scheduling Coordinators** found on the CAISO website.

In addition to the values provided above, each published version of a Recalculation Settlement Statement for a Trading Day also includes populated values for the Previous and Net Settlement Amounts at the specific levels indicated above for the both the Business Associate and CAISO Total levels. Previous and Net Billable Quantities and Billable Prices are only provided at the Charge Code Interval Detail level.

It is important to note that except in the case of Historic Rerun PTB items, the current value (Settlement Amount, Billable Quantity, or Billable Price) of any version or publication of an Initial or Recalculation Settlement Statement represents the absolute transactional amounts, Billable Quantities, and/or Prices for a Trading Day; this means represented values are not incremental.

2.3.5 Disputes, Settlement Adjustments, & Settlement Rerun Adjustments

This section covers dispute processes and timing, common information requirements for disputes, Settlement Adjustments and Settlement Rerun Adjustments.

2.3.5.1 Disputes

The portion of the Settlements Cycle regarding disputes addresses the timing of dispute submittal as well as the common set of general information required for each dispute submitted to CAISO. Additional information regarding the dispute submittal process, the types of disputes, Charge Code specific information requirements, and CAISO dispute responses are detailed in Section 5 of this BPM.

A dispute is routed through a validation/analysis process to determine if it has been submitted on time, and has all information required by CAISO Tariff as detailed in this BPM, Section 2.3.5.1.2. During this analysis process, CAISO determines if the dispute requires a corrective action. That corrective action may be a Settlement Adjustment to Settlements data or to deny the dispute.

2.3.5.1.1 Dispute Timing

The timing by which a Business Associate must provide notification to CAISO of any errors on a given Settlement Statement will vary based on the publication date and is detailed in the CAISO Payments Calendar. This notification must include the specifics detailed in Section 5 of this BPM.

CAISO makes a good faith effort to post dispute related adjustments on the Recalculation Settlement Statement immediately following the Settlement Statement in which the error appeared and for which the dispute was submitted. If the dispute is pending because additional time for research or correction is required, or the outcome of the dispute is dependent on a FERC order to be issued in the future, then the adjustment will appear on a subsequent Recalculation Settlement Statement.

Dispute timelines and disputable content for each Settlement Statement publication is outlined in the table that follows:

Settlement Statement Types	Dispute Deadline	Disputable Content
Initial Statement T+9B *(effective trade date 1/1/2021)*	Thirty-one (31) business days from the relevant Trading Day (T+31B)	All statement content except for estimated meter data
Recalculation Statement T+70B *(effective trade date 1/1/2021)*	Ninety-two (92) business days from the relevant Trading Day (T+92B)	All statement content
Recalculation Statement T+11M (T + 234B) *(effective trade date 1/1/2021)*	Two hundred fifty-six (256) business days from the relevant Trading Day (T+256B)	Only Incremental Changes from Recalculation Statement T + 70B
Recalculation Statement T+21M (T + 446B) *(effective trade date 1/1/2021)*	Four hundred sixty-eight (468) dusiness days from the relevant Trading Day (T+468B)	Only Incremental Changes from Recalculation Statement T + 11M or immediately preceding unscheduled Recalculation Statement
Recalculation Statement T+24M (T + 512B) *(effective trade date 1/1/2021)*	Not disputable	Not disputable

Settlement Statement Types	Dispute Deadline	Disputable Content
Initial Statement T + 3B *(retired trade date 12/31/2020*)	Not disputable	Not disputable
Recalculation Statement T + 12B *(retired trade date 12/31/2020*)	Twenty-six (26) business days from the relevant Trading Day (T +26B)	All statement content except for estimated meter data
Recalculation Statement T + 55B *(retired trade date 12/31/2020*)	Seventy-seven (77) business days from the relevant Trading Day (T + 77B)	All statement content
Recalculation Statement T + 9M (T + 194B) *(retired trade date 12/31/2020*)	No later than 10 months from the relevant Trading Day (T + 216B)	Only Incremental Changes from Recalculation Statement T + 55B
Recalculation Statement T + 18M (T + 383B) *(retired trade date 12/31/2020*)	No later than 19 months from the relevant Trading Day (T + 405B)	Only Incremental Changes from Recalculation Statement T + 9M or immediately preceding unscheduled Recalculation Statement
Recalculation Statement T + 33M (T + 693B) *(effective trade date 8/1/2014)* *(retired trade date 12/31/2020*)	Twenty-two (22) business days from statement publication (T + 715B)	Only Incremental Changes from Recalculation Statement T + 18M or immediately preceding unscheduled Recalculation Statement
Recalculation Statement T + 36M (T + 759B) *(retired trade date 12/31/2020*)	Not disputable	Not disputable
Recalculation Settlement Statement - unscheduled	Twenty-two (22) business days from statement publication	Incremental changes from the immediately preceding Statement
Black Start Capability Initial Statement	Twenty-two (22) business days from the relevant publications of Initial statement associated with Trading Day (T +22B)	All statement content
Black Start Capability Recalculation Statement	Twenty-two (22) business days from the relevant publications of Recalculation statement associated with Trading Day (T +22B)	All statement content
NERC/WECC Information Statement (*effective calendar year 2013 for NERC/WECC Charge Assessment Year 2014 forward*)	Sixty (60) days from statement publication	Calculation of the NERC/WECC Metered Demand for the calendar year two years prior to the NERC/WECC Charge Assessment Year.

Settlement Statement Types	Dispute Deadline	Disputable Content
NERC/WECC Initial Statement	Ten (10) Calendar Days from publication of the associated Invoice	Only typographical or other ministerial error
NERC/WECC Recalculation	Ten (10) Calendar Days from publication of the associated Invoice	Only typographical or other ministerial error
RC Services Informational Statement	Not disputable (correctable per **RC Services BPM Section 12.2**)	Not disputable
RC Services Initial Statement	Twenty-one (21) business days from publication of the associated Invoice	Only typographical or other ministerial error
RC Services Recalculation Statement	Not disputable	Not disputable
HANA Initial Statement	Not disputable	Not disputable
DAAS Initial Statement	Not disputable	Not disputable
TFR Initial Statement	Five (5) business days from publication of the associated Invoice	Only typographical or other ministerial error
TFR Recalculation Statement	Not disputable	Not disputable

As indicated in the table above, Business Associates *cannot* dispute the amounts on a Recalculation Settlement Statement issued on T + 24M in accordance with the sunset provision specified in CAISO Tariff Section 11.29.8.2.

2.3.5.1.2 Common Information Requirements for Disputes

There is a common set of required information for every dispute. To evaluate a dispute submitted by a Business Associate, CAISO must be able to identify the item in the Business Associate's Settlement Statement that is being questioned. Additionally, CAISO must be able to understand the Business Associate's reasons for the dispute. Therefore, for disputes against any Charge Code, the Business Associate must first identify and provide to CAISO the following information:

- Trading Day
- Settlement Period or Trading Hour(s)
- Settlement Statement (type) being disputed
- Charge Group (or Parent Charge Group) and Charge Code
- Dispute Type

- Detailed description of the dispute that includes:
    - Reason for the dispute
    - Specific Charge Code , Bill Determinant disputed, Resource (attribute 2), as well as the configuration calculation equation, if applicable
    - Business Associate calculated Settlement Amount, Billable Quantity, and/or Billable Price
    - Explanation and/or example of how the suggested correction was derived and what Bill Determinants are used in the equation
- Evidence in support of the Business Associate's suggested correction
- Supporting evidence presented as an attachment

As stated previously, additional details on disputes are in Section 5 of this BPM as well as Section 11.29.8 of the CAISO Tariff.

2.3.5.2 Settlement Adjustments & Settlement Statement Reruns

A Settlement Adjustment is defined as a correction to Settlements data processed through the receipt of revised or new input data. Settlement Adjustments are processed as a version to either an Initial or a Recalculation Settlement Statement ***on or before*** a T + 70B publication for the last day of a Trading Month.

A Settlement Rerun Adjustment is a special type of Settlement Adjustment that is defined as one that is processed during a Settlement Statement Rerun. A Settlement Adjustment that is ***published after*** a T+ 70B timeframe for the associated Trading Day is defined as a Settlement Rerun Adjustment. Settlement Rerun Adjustments appear on Recalculation Settlement Statements, including the scheduled Recalculation Settlement Statements for T+11M, T+21M, and T+24M. These statements are generated through a Settlement Statement Rerun which is a recalculation of a Settlement Statement in accordance with the provision of the CAISO Tariff.

Settlement Adjustments and/or Settlement Rerun Adjustments are a result of data revisions made after Initial Settlement Statements are published, disputes filed against any Settlement Statement, good faith negotiations, CAISO Governing Board approval, or FERC Order. Settlement Rerun Adjustments after T+24M will only be made if required by FERC Order or approved by the CAISO Governing Board.

There are three ways of processing Settlement Adjustments or Settlement Rerun Adjustments in the Settlement system:

- The first and default method for processing a Settlement Adjustment or Settlement Rerun Adjustment is through the receipt of changed or new input data provided to the

Settlements system from other CAISO software systems as a Revised Data Set. Settlement Adjustments processed in this manner appear on the relevant version of a Settlement Statement as a new value(s) against the impacted Bill Determinant.

- The second method for processing a Settlement Adjustment or Settlement Rerun Adjustment, if the corrected data cannot be provided from another CAISO software system, is through the receipt of changed or new input data provided through a CAISO Settlement staff member override of Revised Data Set values. Settlement Adjustments processed in this manner appear on the relevant version of a Settlement Statement as a new value(s) against the impacted or disputed Bill Determinant.
- The third and contingency method for processing a Settlement Adjustment or Settlement Rerun Adjustment is through the receipt of a Settlement Amount Adjustment provided through a Settlement Operator entry of a Pass Through Bill (PTB) Charge Code Adjustment. Only those Charge Codes that have been configured with one of the two possible calculation logic sets for PTB Charge Code Adjustments can be adjusted by this means. Settlement Adjustments processed in this manner appear on the relevant version of a Settlement Statement as a PTB Charge Code Adjustment. The calculation logic set to be applied when a PTB Charge Code Adjustment is entered against a Charge Code is detailed in Section 3 of this BPM.

2.3.6 Billing & Payment

This section covers both the schedule for publishing Invoices/Payment Advices against Settlement Statements, as well as the content of those Invoices and Payment Advices. The Settlement system generates a single Invoice or Payment Advice for each set of Settlement Charge Codes with the same Payment Date. The details regarding which Charge Codes have the same Payment Date are covered in Section 4 of this BPM.

Each Invoice or Payment Advice published by CAISO contains a Business Associate's net financial obligation with regard to all Settlement transactions for all Bill Periods that are included on that Invoice or Payment Advice. The net financial obligation is represented as a Net Settlement Amount that is categorized either as an amount receivable or an amount payable. If a Business Associate's net financial obligation is a negative Net Settlement Amount (that is, an amount receivable to the Business Associate) the output is a Payment Advice. If a Business Associate's net financial obligation is a positive Net Settlement Amount (that is, an amount payable from the Business Associate) the output is an Invoice.

2.3.6.1 Schedule for Invoice/Payment Advice Publication

The schedule for generating and issuing Invoices and Payment Advices against Settlement Statements or RMR Contract amounts for a Bill Period is called the Invoicing Cycle and is defined

in the Tariff. During the course of a business day, CAISO generates and publishes Settlement Statements prior to generating and publishing any Invoices/Payment Advices scheduled for the calendar day. CAISO prepares and publishes to each Business Associate Invoices/Payment Advices for varying Bill Periods in accordance with Tariff section 11.29.10.

Invoices and Payment Advices are published on a weekly basis every Wednesday in accordance with the CAISO Payments Calendar. To the extent the Wednesday is a CAISO holiday, the Invoices and Payment Advices are published on the next business day following the holiday. Each Invoice or Payment Advice that is published has a unique Invoice number and can contain multiple Bill Periods of varying duration within different Trade Months.

2.3.6.2 Content of Invoices/Payment Advices

One XML file makes up the content of any published version of an Invoice or Payment Advice. The content of this file includes Previous, Current, and Net Settlement Amounts for multiple Bill Periods and multiple Settlement Statement Types. The net total on the Invoice or Payment Advice represents the Business Associate's financial obligation for all Bill Periods included. Additional specifics regarding the XML file are detailed in the **Settlements Interface Specification for Scheduling Coordinators** found on the CAISO website.

Invoices/Payment Advices contain only those Settlement Amounts that are included on a published version of a Settlement Statement. A Bill Period for a given Settlement Statement Type is a consecutive range of Trading Days defined by a Bill Period Start date and a Bill Period end date and is used to drive the time periods included in a given Invoice/Payment Advice.

In general, the Bill Period Start date for a given Settlement Statement Type is the first Trading Day in the defined Bill Period range and the Bill Period End date is the last Trading Day in the Bill Period Range. For purposes of weekly invoicing, the Bill Period duration, or range of aggregated Trading Days for inclusion on a given invoice, varies for each Settlement Statement Type. The Bill Period end date for a given Bill Period duration may or may not be the last Trading Day in a Trading Month and therefore may or may not include the monthly statement for the associated Trading Month.

To ensure initial cash clearing within fourteen days of a Trading Day, the Bill Period duration for Initial Settlement Statements T + 9B is approximately seven Trading Days (the approximation is variable due to holidays that may occur in a given invoice week). In application, this means that a given weekly invoice will include market transactions from Trading Days Friday through Thursday of the week preceding the invoice. The only exception to this rule occurs in a few instances when a recognized holiday falls on Monday. In this particular case, T+9B settlement statements for the preceding Friday, Saturday and Sunday will publish on Friday, rather than the Thursday. Because

of this one business day delay, invoicing the associated market transactions will occur in the following week's invoicing cycle.

The Bill Period duration for Recalculation Settlement Statements T + 70B is aligned with the corresponding Initial Settlement Settlements. Therefore, invoicing of Recalculation Settlement Statements T+ 70B will only occur once a matched Bill Period duration (range of Trading Days) is published.

As all settlement statements published after the Recalculation Settlement Statements T + 70Bare optional, the Bill Period duration for those statements will vary based on the Trading Days that published in accordance with those timelines. This covers the Recalculation Settlement Statements for T + 11M through T + 24M, as well as any unscheduled Recalculation Settlement Statement. Invoicing of these statements will occur on the next weekly invoice instance that takes place after the publication deadline for all Trading Days in the corresponding Trade Month (includes the corresponding monthly statement) has passed, regardless of whether or not those Trading Days required publication.

The table below sets provides a summary of the Bill Period duration definitions for each Settlement Statement Type:

Settlement Statement Type	Bill Period Duration Required for Inclusion in Weekly Invoice
Initial Statement T + 9B *(effective trade date 01/01/2021)*	Published daily statements or monthly statement for the Friday through Thursday Trading Days preceding the invoice.
Recalculation Statement T + 70B *(effective trade date 01/01/2021)*	Aligned with Initial Statements T + 9B
Recalculation Statement T + 11M *(effective trade date 01/01/2021)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement T + 21M *(effective trade date 01/01/2021)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement T + 24M *(effective trade date 01/01/2021)*	Any published daily and/or monthly statement (if necessary)
Initial Statement T + 3B *(retired trade date 12/31/2020)*	Published daily statements or monthly statement for the Monday through Sunday Trading Days preceding the invoice.
Recalculation Statement T + 12B *(retired trade date 12/31/2020)*	Aligned with Initial Statements T + 3B
Recalculation Statement T + 55B *(retired trade date 12/31/2020)*	All published daily statements plus the corresponding monthly statement for the Trade Month
Recalculation Statement T + 9M *(retired trade date 12/31/2020)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement T + 18M *(retired trade date 12/31/2020)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement T + 33M *(effective trade date 8/1/2014)* *(retired trade date 12/31/2020)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement T + 36M *(retired trade date 12/31/2020)*	Any published daily and/or monthly statement (if necessary)
Recalculation Statement - unscheduled	Any published daily and/or 'monthly' statement if criteria specified in section 2.3.2 is met

Since a given Market Invoice or Payment Advice can contain multiple Bill Periods (sets of Initial and Recalculation Statement results), each line item in an Invoice provides a designation as to which Bill Period type it applies ('INITIAL', 'RECALC', 'HISTORIC_INITIAL', or 'HISTORIC_RECALC').

Each published version of ***any*** Invoice or Payment Advice includes the following standard hierarchy levels:

- An Invoice/Payment Advice total, which is the total Net Settlement Amount payable or receivable for all Charge Codes in all Bill Periods included on the Invoice or Payment Advice
- A Bill Period total, which includes a Previous, Current, and Net Settlement Amount payable or receivable for all Charge Codes in each Bill Period included on the Invoice or Payment Advice, listing or displaying the most current Bill Period first at both a Business Associate and CAISO total level
- A Parent Charge Group total, which includes the Previous, Current, and Net Settlement Amount payable or receivable for all Charge Codes in each Parent Charge Group for each Bill Period at both a Business Associate and CAISO total level
- A Charge Group total, which includes the Previous, Current, and Net Settlement Amount payable or receivable for all Charge Codes in each Charge Group for each Bill Period at both a Business Associate and CAISO total level
- A Charge Code total, which includes the Previous, Current, and Net Settlement Amount payable or receivable for each Charge Code for each Bill Period at both a Business Associate and CAISO total level
- PTB Direct line items for Financial Adjustment transaction totals, which include the Previous, Current, and Net Settlement Amount line item details for the amounts payable or receivable for all Charge Codes identified as a PTB Direct for a Financial Adjustments at both a Business Associate and CAISO Total level. The Invoice/Payment Advice also includes all relevant attributes associated with the Charge Codes identified as a PTB Direct for a Financial Adjustments.
- "Do Not Send Payment" is included on Payment Advices and the specific Payment Date and time are included on all Invoices
- Business Associate details, such as contact information, payment method, and bank account information
- CAISO details, such as contact information and bank account information
- Additional Invoice/Payment Advice outputs as specified in the **Settlements Interface Specification for Scheduling Coordinators.**

2.4 Payment Calendars

In support of Settlement and Billing timelines, CAISO is authorized by Tariff section 11.29.24 to develop and maintain two Payment Calendars, the CAISO Payments Calendar, and the RMR Payments Calendar. Both of these calendars set out key dates associated with specific activities associated with the Settlements and market clearing business functions.

2.4.1 CAISO Payments Calendar

As detailed in under Section 11.29.24 of the CAISO Tariff, CAISO prepares and posts a payment calendar associated with the Settlement of Market transactions that are not covered under a RMR Contract.

The most current CAISO Payment Calendar is posted on the CAISO website at: http://www.caiso.com/docs/2001/09/21/200109210951225246.html.

2.4.2 RMR Payments Calendar

As detailed in under Section 3 of Part J, in Attachment N of the CAISO Tariff, CAISO prepares and posts a payment calendar associated with RMR Contracts.

The most current RMR Payment Calendar is posted on the CAISO website at: http://www.caiso.com/docs/2001/09/21/200109210951225246.html.

2.4.3 RC Services Payments Calendar

The CAISO publishes a calendar of important RC Services dates, including data submission timelines, statement and invoice publishing dates, and payment due dates.

This calendar can be found on the CAISO Settlements webpage: http://www.caiso.com/market/Pages/Settlements/Default.aspx

3. Settlements Process

Welcome to the *Settlements Process* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- A description of a Settlement Run and various Settlement Run Types
- How CAISO groups Charge Codes
- A description and processing rules for the three types of Pass Through Bill (PTB) transactions
- How CAISO schedules calculation runs

3.1 Settlement Runs & Types

A Settlement Run is the daily execution of specified Settlement calculations in order to generate either current or revised Settlement results for output. During the execution of a Settlement Run, both charges and matching revenue distributions are calculated as balanced transactions in accordance with the equations specified for each Charge Code and Pre-calculation. For all calculations included in a Settlement Run, revenue distributions are payments to a Business Associate expressed as a negative value and charges are monies owed from a Business Associate expressed as a positive value. There are two categories of Settlement Runs: Initial and Recalculation. Also, there are two granularities of Settlements Runs: daily and monthly.

A unique Settlement Run is defined for each Settlement calculation result set that contains a specific set of Charge Codes and Pre-calculations for a needed granularity. Each of these defined Settlement Runs is a unique Settlement Run Type. A Settlement Run Type exists in support of each for the following result sets:

Settlement Run Type	Description of Output
TAC Rate Run	Run including all pre-calculations needed to calculate and provide current TAC and Wheeling rates for posting.
NERC/WECC Information Statement (*effective calendar year 2013 for NERC/WECC Charge Assessment Year 2014 forward*)	Run including the NERC/WECC Metered Demand quantity for the calendar year two years prior to the NERC/WECC Charge Assessment Year.
RC Services Informational Run	Run including the billing data volumes as submitted through MRI-S or NERC/WECC Metered Demand for the calendar year two years prior to the RC Services Charge assessment year.
Black Start Capability Initial Run	Run including the Black Start Capability payments associated with the trade month. This run is used to generate the Black

Settlement Run Type	Description of Output
	Start Capability Statement used in subsequent billing and invoicing.
RC Services Initial Run	Run including RC Services Charges associated with the assessment year. This run is used to generate the RC Services Charge Statement used in subsequent billing and invoicing.
HANA Initial Run	Run including HANA Services Charges associated with the associated assessment year. This run is used to generate the HANA Services Charge Statement used in subsequent billing and invoicing.
DAAS Initial Run	Run including DAAS Services Charges associated with the associated assessment year. This run is used to generate the DAAS Services Charge Statement used in subsequent billing and invoicing.
Daily Initial Market Run	• Initial run for each Charge Code calculated on a daily basis with the same Payment Date. This run is executed for each Trading Day in the Trading Month and used to facilitate the generation and publication of all versions of the Daily Initial Settlement Statement.
Monthly Initial Market Run	Initial run for each Charge Code calculated on a monthly basis (all Trading Days in a Trading Month) with the same Payment Date. This run is executed once for each Trading Month and used to facilitate the generation and publication of all versions of the Monthly Initial Settlement Statement.
NERC/WECC Initial Run	Initial run containing the preliminary NERC/WECC Charge for the associated assessment year. This run is used to generate the NERC/WECC Initial Statement used in subsequent billing and invoicing.
TFR Initial Run	Initial run containing the Transferred Frequency Response Charge for the associated assessment year. This run is used to generate the TFR Initial Statement used in subsequent billing and invoicing.
Daily Recalculation Market Run	Recalculation run for each Charge Code calculated on a daily basis with the same Payment Date. This run is executed for each Trading Day in the Trading Month and used to facilitate the generation and publication of all versions of the Daily Recalculation Settlement Statement.
Monthly Recalculation Market Run	Recalculation run for each Charge Code calculated on a monthly basis (all Trading Day in a Trading Month) with the same Payment Date. This run is executed once for each Trading Month and used to facilitate the generation and publication of all versions of the Monthly Recalculation Settlement Statement.
Black Start Capability Recalculation Run	Recalculation run including the final Black Start Capability payment for the associated Trading Month. This run is used to generate the Black Start Capability recalculation Statement used in subsequent billing and invoicing.

Settlement Run Type	Description of Output
NERC/WECC Recalculation Run	Recalculation run containing the final NERC/WECC Charge for the associated assessment year. This run is used to generate the NERC/WECC Recalculation Statement used in subsequent billing and invoicing.
RC Services Recalculation Run	Recalculation run including the final RC Services Charge for the associated assessment year. This run is used to generate the RC Services recalculation Statement used in subsequent billing and invoicing.
TFR Recalculation Run	Recalculation run containing the Transferred Frequency Response Charge for the associated assessment year when dispute resolution is necessary or in the event a Scheduling Coordinator defaults on the payment of all or any portion of the charges on the initial TFR invoice. This run is used to generate the TFR Recalc Statement used in subsequent billing and invoicing.
Daily Rerun Market Run	Same as the Daily Recalculation Market Run, however this excludes FERC Fee Charge Codes that are exempt from Settlement Statement Reruns. This run is executed for each Trading Day in a Trading Month subject to the rerun and used to facilitate the generation and publication of all versions of the Daily Rerun Settlement Statement.
Monthly Rerun Market Run	Same as the Monthly Recalculation Market Run, however this excludes FERC Fee Charge Codes that are exempt from Settlement Statement Reruns. This run is executed once for each Trading Month subject to the rerun and used to facilitate the generation and publication of all versions of the Monthly Rerun Settlement Statement.
Initial RMR Run	Initial run for each RMR Contract Invoice amount with the same Payment Date in accordance with the CAISO RMR Payment Calendar.
Historic Initial Market Rerun	Initial run for each Consolidated Historic Charge Code ID PTB to the production system. The run is executed on a daily basis to include PTB amounts for each Trading Day and Trading Month in the period subject to the historic rerun. This run is used to facilitate the generation and publication of all versions of the Historic Initial Market Rerun Settlement Statement.
Historic Recalculation Market Rerun	Recalculation run for each Consolidated Historic Charge Code ID PTB to the production system. The run is executed for each Trading Day and/or Trading Month for the period subject to an additional historic rerun after an initial. This run is used to facilitate the generation and publication of all versions of the Historic Recalculation Market Rerun Settlement Statement.

Note that if a Settlement Run category is not applicable for a given result set, a unique Settlement Run Type is not defined (for example, there is no recalculation for RMR, as such, there is no Recalculation RMR Run defined).

The table below provides a summary of the Settlement Run Types used for each Settlement Statement Type that is a defined part of the ISO Payment Calendar:

Settlement Run Type(s)	Settlement Statement Types
Daily Initial Market Run & Monthly Initial Market Run	Initial Settlement Statement T + 3B *(retired trade date 12/31/2020)*
Daily Initial Market Run & Monthly Initial Market Run	Initial Settlement Statement T + 9B *(effective trade date 1/1/2021)*
Daily Recalculation Market Run & Monthly Recalculation Market Run	Recalculation Settlement Statement T + 12B *(retired trade date 12/31/2020)*
Daily Recalculation Market Run & Monthly Recalculation Market Run	Recalculation Settlement Statement T + 55B *(retired trade date 12/31/2020)*
Daily Recalculation Market Run & Monthly Recalculation Market Run	Recalculation Settlement Statement T + 70B *(effective trade date 1/1/2021)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 9M *(retired trade date 12/31/2020)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 11M *(effective trade date 1/1/2021)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 18M *(retired trade date 12/31/2020)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 21M *(effective trade date 1/1/2021)*
Daily Rerun Market Run & Monthly Rerun Market	Recalculation Settlement Statement T+24M *(effective trade date 1/1/2021)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 33M *(effective trade date 8/1/2014)* *(retired trade date 12/31/2020)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 35M *(retired trade date 8/1/2014)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement T + 36M *(retired trade date 12/31/2020)*
Daily Rerun Market Run & Monthly Rerun Market Run	Recalculation Settlement Statement - unscheduled
Black Start Capability Initial Run	Black Start Capability Initial Statement
Black Start Capability Recalculation Run	Black Start Capability Recalculation Statement

Settlement Run Type(s)	Settlement Statement Types
HANA Initial Run	HANA Initial Statement
DAAS Initial Run	DAAS Initial Statement
NERC/WECC Information Run (*effective calendar year 2013 for NERC/WECC Charge Assessment Year 2014 forward*)	NERC/WECC Information Statement
NERC/WECC Initial Run	NERC/WECC Initial Statement
NERC/WECC Recalculation Run	NERC/WECC Recalculation Statement
RC Services Initial Run	RC Services Initial Statement
RC Services Recalculation Run	RC Services Recalculation Statement
RC Services Informational Run	RC Services Informational Statement
TFR Initial Run	TFR Initial Statement
TFR Recalculation Run	TFR Recalculation Statement

The result set of each Settlement Run Type and the content of any output provided from the Settlement system to Business Associates are presented as Bill Determinants. Totals for Bill Determinants, Settlement Amounts, Billable Quantities, and Billable Prices for Charge Codes are provided in the standard hierarchy levels described in Sections 2.3.3 for Settlement Statements and 2.3.5.2 for Invoices and Payment Advices of this BPM.

A Bill Determinant is a specific input or output value of a Settlement calculation that has attributes that provide differentiating characteristics of the value for use in an equation for a Charge Code or Pre-calculation. Bill Determinants can be described as Raw (or primary), Intermediate, or Final:

- Raw Bill Determinants are those provided as input data to the Settlement system. Sometimes these Bill Determinants are also referred to as 'primary'. Pass Through Bill (PTB) items are a special type of Raw Bill Determinant
- Intermediate Bill Determinants are the derived results of Settlement calculations
- Final Bill Determinants are the Billable Quantity, Settlement Amount, and Billable Price that represent a Charge Code calculation.

It is important to note that by definition, Final Bill Determinants are also Intermediate Bill Determinants and not all Charge Codes have all types of Final Bill Determinants.

A Business Associate only receives the values associated with its Bill Determinants, Settlement Amounts, Billable Quantities, and Billable Prices. A Business Associate does not receive these details for another Business Associate. This is true for all values calculated in the Settlement

system, including Pass Through Bill transactions. All Business Associates are provided with market-wide and/or CAISO total amounts, quantities, and prices.

3.2 Charge Code Groupings for Settlements

Charge Codes in the Settlement system are associated to specific Charge Groups and Parent Charge Groups. Charge Codes are also associated with a specific Settlement Run Type. The associations are used to identify which Charge Codes the calculation engine sums to achieve the totals for these standard hierarchy levels.

This summation logic not only supports the reporting and drill down abilities on Settlement Statements from the Run total all the way to the Raw Bill Determinants, but also the reporting and drill down abilities on Invoices or Payment Advices from the Invoice/Payment Advice total to the Charge Code total for the Bill Period.

The **Charge Group & Parent Charge Group Specification** list attached in **Attachment B** itemizes all the Charge Codes with their associated *Parent Charge Group*, *Charge Groups*, *Settlement Amount Granularity*, as well as the *Invoice Run Type* in which they are included.

With respect to the *Settlement Amount Granularity*, it is important to note that there may be cases where some Bill Determinants used in a particular Charge Code are calculated on a daily basis; however the *Settlement Amount Granularly* for the Charge Code is monthly as indicated in **Attachment B**.

3.3 Pass Through Bill Transactions

Pass Through Bill (PTB) functionality allows transactions from external sources to be included on CAISO Settlement Statements and Invoices. The functionality is used to enter specified Raw Bill Determinants for use by specific Settlement calculations or to enter Charge Code Adjustments against system-generated results.

There are three different types of PTB. The way each type of PTB is used within a calculation varies based on the type. The three PTB types are:

- PTB Direct Charge
- Historic Rerun PTB
- PTB Charge Code Adjustment

3.3.1 PTB Direct Charges

PTB Direct Charges are Current Settlement Amount entries associated with specific Charge Codes that are not calculated by the Settlements system and are directly assigned to a

Settlement Statement and Invoice or Payment Advice. These Settlement Amounts require no additional calculation logic to be executed during a Settlement Run. PTB Direct Charge Settlement Amounts are entered with other defining attributes as specified within the calculation equations in support of granularity requirements specified by the CAISO Tariff. If a Charge Code is entered as a PTB Direct Charge, it states so in the content section of the BPM Configuration Guide associated with that Charge Code. Examples of PTB Direct Charges include 1101 Black Start Capability Allocation, and CC 3101 Black Start Capability Settlement. It is important to note that CC 3010 RMR Invoice Amounts and Historic Rerun PTBs are also PTB Direct Charges; however, these are entered as *Net Settlement Amounts* as opposed to Current Settlement Amounts. RMR Invoice Amounts are explained in the content section of the BPM Configuration Guide associated with Charge Code 3010 and Historic Rerun PTBs are explained in Section 3.3.2 of this BPM.

There are two subcategories of PTB Direct Charges; one of which is PTB Financial Adjustments. A PTB Financial Adjustment is a method for entering Current Settlement Amounts provided by the market clearing system that adjusts for specific financial scenarios outside of CAISO Market transactions. In contrast to a PTB Charge Code Adjustment, where a dollar amount is entered to change or modify a Settlement Amount associated with a system generated Charge Code, PTB Financial Adjustments are dollar amount credit or debit adjustments related to the collection and distribution of interest (such as in CC 2999 or 3999), as well as the re-allocation or re-distribution of dollars in the event of a Shortfall (in CC 5910 and 5900) during the cash clearing process. These amounts are entered with other defining attributes as specified within the calculation equation in support of the granularity requirements specified by the CAISO Tariff.

The second subcategory of PTB Direct Charges is PTB Bill Determinants. A PTB Bill Determinant is a type of Raw Bill Determinant used to enter input data needed for calculating a specific Charge Code or Pre-calculation in cases where the input data are not provided from upstream CAISO systems or predecessor Settlement calculations. If a Bill Determinant needed for a Charge Code (or Pre-calculation) equation is entered as a PTB Bill Determinant, it is stated so in the content section of the BPM Configuration Guide associated with that Charge Code or Pre-calculation. Examples of PTB Bill Determinants are the Monthly Submitted Load Exemptions quantity used in the HVAC Metered Load Pre-calculation and the Real-Time Contract Amount used in the Wheel Export Quantity Pre-calculation.

PTB Direct Charges are treated as any other system-generated Charge Code in terms of the standard hierarchy levels for Settlement Statements described in Section 2.3.3 of the BPM. Additionally, PTB Bill Determinants are treated as any other Raw Bill Determinant in terms of the standard hierarchy levels for Settlement Statements described in Section 2.3.3 of this BPM. However, Charge Codes generated by a PTB Financial Adjustment entry are grouped together in their own Parent Charge Group on both Settlement Statements and appear on the Invoice or

Payment Advice. The types of Parent Charge Groups for PTB Financial Adjustments are discussed in Section 3.2 of this BPM.

3.3.2 Historic Rerun PTBs

The Settlement system in place as April 1, 2009 calculates Settlement result sets (and the associated Settlement Statements, Invoices, and Payment Advices) for all ***prospective*** Trading Days from April 1, 2009. Settlement Rerun Adjustments for Trading Days prior to this date are calculated exclusively in the legacy system and processed as a *Historic* Settlement Statement Rerun. The legacy Settlement system provides Net Settlement Amounts as PTB transactions to the production system as summary line items applied to both the Net and Current Settlement Amount hierarchy levels in order to publish both summary Settlement Statements and Invoices/Payment Advices in the XML format. These Settlement Amounts in the production system are provided against a new consolidated Historic Charge Code ID that represents a specific set of legacy Charge Codes; this information is detailed in the **Group & Parent Charge Group Specification** list included in **Attachment B.** The supporting detail files are generated by and published to Market Participants from the legacy Settlement System in the CSV format via CD.

Like PTB Direct Charges, Historic Rerun PTB items are entered for direct assignment to a Settlement Statement, Invoice, and/or Payment Advice; however, they are Net Settlement Amounts applied to both the Net *and* Current Settlement Amount hierarchy levels as opposed to a Current Settlement Amount.

3.3.2.1 Determination of the Net Settlement Amount

Historic Rerun PTB Settlement Amounts are entered to the production Settlements system as Net Settlement Amounts because of the methodology used to calculate and input Settlement Rerun Adjustment line items in the legacy system; that is, via manual line item Settlement Adjustments. The manual line item Settlement Adjustments are generated either as a result of ***system calculated delta amounts*** or ***reversals and new lines against previously entered manual line item Settlement Adjustments***.

System calculated deltas are the incremental Settlement Amount(s) that must be charged or paid in addition to the previously calculated Settlement Amount. The delta amount is determined through an automated calculation of the difference between the previous Settlement Amount and the revised Settlement Amount. For example, if the previously calculated Settlement Amount was a payment of -$10 and the revised Settlement Amount is -$12, the incremental Settlement Amount is calculated as an additional payment needed of -$2; this additional payment is the delta or Net Settlement Amount entered as the manual line item Settlement Adjustments.

The same principle is true for reversals and new line items against previously entered manual line item Settlement Adjustments; however, the method for getting to the delta amount is slightly different. If the previously entered manual line item Settlement Adjustment Settlement Amount was -$10, and the revised Settlement Amount should reflect a payment of -$15, the manual line item Settlement Adjustment uploaded should include both a reversing line item for the previous payment as $10 as well as a line item for the revised Settlement Amount of -$15, resulting in a detail or Net Settlement of -$5. All the Net Settlement Amounts for Charge Codes are summed to the appropriate Historic Charge Code ID, for each Business Associate, for each Trading Day and entered as the Historic Rerun PTB transaction to the production system.

Historic Rerun PTB transactions appear on an Initial Settlement Statement the first time a Trading Day is subject to a Settlement Statement Rerun via the production system. The data is not recalculated until that Trading Day is subject to another Settlement Statement Rerun. After that, the Historic Rerun PTB transactions appear on a Recalculation Settlement Statement. Non-zero Previous Settlement Amounts are only available on a Recalculation Settlement Statement.

Since all Historic Rerun PTB amounts entered as Net Settlement Amounts which are applied to both the Net *and* Current Settlement Amount hierarchy levels, the production system does not calculate these hierarchy levels on each Settlement Statement as it does for other PTBs or Charge Codes. The only calculation logic that remains the same is that the Previous Amount on a Recalculation Settlement Statement will equal the Current Settlement Amount from the immediately preceding invoiced statement. The calculation logic for Historic PTBs is applied in the same manner regardless of how many times a Historic Rerun PTB item for a given Trading Day is rerun in the legacy system and provided to the production system.

As an example, the text below describes the calculation logic applied in the production system:

- ***Scenario*** *— The first instance in which Trading Day = X is rerun in the legacy system and entered to the production system:*
  - Preliminary records for Settlement Amounts calculated in the legacy system (already Net due to the processing methods for Settlement Rerun Adjustments discussed above) are consolidated to a Historic Charge Code ID, summed to the Trading Day for a given Business Associate and entered to the production system as the Historic Rerun PTB
    - This value appears as the Net and Current Settlement Amounts on the Initial Settlement Statement generated for the Trading Day
    - The Previous Settlement Amount is calculated as the Current Settlement Amount from the previous calculation run executed (and invoiced) in the production system.

In this case, the Previous Settlement Amount is zero as this is the first instance in which the Trading Day has been calculated in the production system.

- ***Scenario*** *— The second instance in which Trading Day = X is rerun in the legacy system and entered to the production system. Note that the process once again begins with Preliminary records from the legacy system as there is no recalculation functionality in the legacy system:*
  - Preliminary records for Settlement Amounts calculated in the legacy system (already Net due to the processing methods for Settlement Rerun Adjustments discussed above) are consolidated to a Historic Charge Code ID, summed to the Trading Day for a given Business Associate and entered to the production system as the Historic Rerun PTB
    - This value appears as the Net and Current Settlement Amounts on the first Recalculation Settlement Statement generated for the Trading Day
    - The Previous Settlement Amount is calculated as the Current Settlement Amount from the previous calculation run executed (and invoiced) in the production system. In this case, the Previous Settlement amount is the Current Settlement Amount from the Initial Settlement Statement.
- ***Scenario*** *— The third, fourth, fifth, etc… instance in which Trading Day = X is rerun in the legacy system and entered to the production system. Subsequent executions always begin with Preliminary records from the legacy system:*
  - Preliminary records for Settlement Amounts calculated in the legacy system (already Net due to the processing methods for Settlement Rerun Adjustments discussed above) are consolidated to a Historic Charge Code ID, summed to the Trading Day for a given Business Associate and entered to the production system as the Historic Rerun PTB
    - This value appears as the Net and Current Settlement Amounts on the second, third, fourth, etc…Recalculation Settlement Statement generated for the Trading Day
    - The Previous Settlement Amount is calculated as the Current Settlement Amount from the previous calculation run executed (and invoiced) in the production system. In this case, the Previous Settlement amount is the Current Settlement Amount from the first, second, third, etc…Recalculation Settlement Statement.

3.3.2.2 Charge Code Groupings for Historic Rerun PTBs

With the exception of the Current, Previous, and Net treatment described in the previous section, Historic Rerun PTBs are treated as any other Charge Code in terms of the standard hierarchy levels for Settlement Statements described in Section 2.3.3 of this BPM, up to the Charge Group level.

Each legacy Charge Code is logically categorized into one of the following categories (this is also detailed in the **Charge Code & Parent Charge Group Specification** list provided in **Attachment B**. This categorizing helps to determine if a consolidated Historic Rerun PTB Charge Code is necessary. Charge Codes categorized as 'New' do not have any Historic Rerun PTBs.

- Replaced: Replaced Charge Codes are those retired legacy Charge Codes that are replaced by a new Charge Code number in the production system. Replaced Charge Codes are represented in the production system by a consolidated Historic Rerun PTB Charge Code.
    - Legacy Charge Codes that are replaced with a balancing Bill Determinant or replaced with GL balancing do not require representation by a consolidated Historic Rerun PTB Charge Code as the offset can be accommodated through automated balancing in the General Ledger or a configured Bill Determinant rather than a Charge Code.
- Retired: Retired Charge Codes are those retired legacy Charge Codes that are not replaced by a new Charge Code in the production system. The majority of Retired Charge Codes are represented in the production system by a consolidated Historic Rerun PTB Charge Code.

Some retired Charge Codes may not be represented by a consolidated Historic Rerun PTB Charge Code if the legacy Charge Code is accommodated by some other means, such as automated balancing in the General Ledger or a configured Bill Determinant.

- Continue: Charge Codes that continue from the legacy to the production system with the same Charge Code number. Charge Codes that continue are represented in the production system by a consolidated Historic Rerun PTB Charge Code.

The **Charge Group & Parent Charge Group Specification** list included in **Attachment B** itemizes all the legacy Charge Codes associated to the relevant consolidated *Historic Rerun PTB Charge Code* (by name and number), as well as each *Historic Charge Code's Charge Group* and *Parent Charge Group*.

3.3.2.3 Historic Rerun PTB Outputs

Historic Rerun PTB transaction outputs as published on the Initial or Recalculation Settlement Statement can be cross-referenced to the supporting statement and detail files generated and published through the legacy system. This cross-reference is accomplished by including the Settlement Summary ID as an attribute against each Historic Rerun PTB line item provided to the production system. This allows Business Associates to know which legacy system detail file includes the Historic Rerun PTB item as shown on the production Settlement Statement, Invoice, or Payment Advice.

3.3.3 PTB Charge Code Adjustments

A PTB Charge Code Adjustment is a method for processing a Settlement Amount Adjustment to a system generated Charge Code Settlement Amount and is one of the three possible ways of processing a Settlement Adjustment to settlement calculation results as described in Section 2.3.4.2 of this BPM. It is the least preferred way, and used as a contingency resolution method if receiving corrected input data or making manual overrides of input data ***is not possible or not appropriate*** to meet CAISO Settlement, Billing, and Invoicing process needs per the CAISO Tariff.

The PTB Charge Code Adjustment principles specified in this section intend to achieve goals for a standard and repeatable method for processing Settlement Adjustments to Settlement Amounts across all Charge Codes. This method not only provides the structure needed to support seamless drill down capabilities from one hierarchy level to the next, but also is restrictive enough that it prevents a reliance on PTB Charge Code Adjustments as a "normal" way of calculating Settlement Amounts, as is the case with legacy processing.

Thus, entering PTB Charge Code Adjustments for those applicable Charge Codes at the same level and granularity allows CAISO to gain a contingency method for applying a Settlement Adjustment to settlement calculation results and greater process efficiency due to repeatability. PTB Charge Code Adjustments are used in cases where receiving updated input data or overriding input data prior to the execution of a Recalculation are neither possible nor appropriate for resolving the Settlement Amount discrepancy.

In most cases, PTB Charge Code Adjustments are used as method for modifying settlement dollars paid or charged for a given Charge Code as a result of a good faith negotiation settlement process.

3.3.3.1 Types of PTB Charge Code Adjustments

PTB Charge Code Adjustments are allowed ***only*** for specific Settlement Charge Codes as either a *PTB Charge Adjustment* or a *PTB Allocation Adjustment*. If a Charge Code can be adjusted by

one of the PTB Charge Code Adjustment types, it states so in the business rules section of the BPM Configuration Guide for each Charge Code as well as the **Charge Group & Parent Charge Group Specification** provided in **Attachment B**. A Charge Code that can be adjusted by a PTB may also be identified by the existence of either a PTB Charge Adjustment or PTB Allocation Adjustment input variable. Please note that:

- Currently, there are no Charge Codes that are designated to have PTB Allocation Adjustment logic.
- Several Charge Codes cannot be adjusted by either type of PTB Charge Code Adjustment.

A PTB Charge Adjustment is a type of PTB Charge Code Adjustment calculation method that allows for the adjustment of Charge Codes that aim to pay (or charge) a Business Associate for a specific transaction. A PTB Allocation Adjustment is a type of PTB Charge Code Adjustment calculation method that allows for the adjustment of Charge Codes that recover costs (or payments) pro-rata or per-unit from all Business Associates to achieve neutrality. The PTB Charge Code Adjustment type associated with each Charge Code is itemized in the **Charge Group & Parent Charge Group Specification** list attached in **Attachment B**. Additionally, **Attachment C**, **PTB Charge Code Adjustment Examples Part I**, provides a numeric example for both types of PTB Charge Code Adjustments and **Part II** provides a workbook for testing theoretical scenarios for PTB Allocation Adjustments.

3.3.3.2 Calculation Basics for PTB Charge Code Adjustments

All PTB Charge Code Adjustment amounts are entered into the Settlements System:

- At the Business Associate level by the interval relevant for the Charge Code. If a Charge Code settles at a 10-minute interval, the PTB entry is made at the 10-min granularity; if a Charge Code settles at an hourly interval, the PTB entry is made at the hourly granularity, and so forth.
- Against a specific Charge Code. The PTB variable name also provides an indication of the Charge Code adjusted. PTB Charge Adjustments are named as 'PTBChargeAdjustment *[ChargeCodeName]*' and PTB Allocation Adjustments are named 'PTBAllocationAdjustment *[ChargeCodeName]*'. PTB Charge Code Adjustments do not apply to Pre-calculations.
- As a Net (or delta) Settlement Amount against the calculated Current Settlement Amount (accounting for all previously entered PTB Charge Code Adjustments, if any) for the Charge Code at the Charge Code Interval Total standard hierarchy level. For example, if the system generated Current Settlement Amount is -$500 (payment due to the Business Associate) for a given interval and a settlement agreement is reached that the Business

Associate should be paid -$625 in this interval, then the delta adjustment or Net Settlement Amount is calculated by a Settlement Operator as New Amount – Current Settlement Amount = Net Settlement Amount. That is, -$625 – -$500 = -$125. The -$125 is entered as the PTB Charge Code Adjustment.

- With appropriate validation logic to ensure neutrality is always maintained
- Such that other relevant information is provided in the statement file in the format specified in the **Settlements Interface Specification for Scheduling Coordinators.**

3.3.3.3 Charge Code Groupings for PTB Charge Code Adjustments

As mentioned above, PTB Charge Code Adjustments entered as Net Settlement Amounts are presented on the statement file in the format specified in the **Settlements Interface Specification for Scheduling Coordinators**. In order to ensure neutrality is maintained and Business Associates are able to validate Settlement Amounts, PTB Charge Code Adjustments are grouped into the standard hierarchy levels as follows:

- PTB Charge Code Adjustments are presented as Raw Bill Determinants at a Business Associate, interval, and PTB ID granularity. PTB ID is a unique numeric identifier attached to each PTB Charge Code Adjustment entered to the Settlements system.
- At the Charge Code Interval Detail total level, PTB Charge Code Adjustments are presented by Business Associate, by interval, summed over PTB ID as the Net Settlement Amount payable or receivable. Therefore, if multiple PTB Charge Code Adjustments exist for the same Business Associate and interval, the Net Settlement Amounts for these PTB items would be summed.
- At the Charge Code Interval Sub-total level, PTB Charge Code Adjustments are presented as a value equal to the value presented at the Charge Code Interval Detail total level. This ensures a seamless transition from one hierarchy level to the next, that Settlement Amounts presented at each hierarchy level for Charge Codes and PTB Charge Code Adjustments have a consistent attribute set, and also achieves the goal of a standard processing methodology for Adjustments. Settlement Amounts, which are needed to feed successor calculations, are taken from this hierarchy level; therefore the total market amount to be allocated includes PTBs.
- At the Charge Code Interval total level, the Charge Code Interval sub-total level for both the Charge Code (the Current Settlement Amount generated by the system) is summed with the Charge Code Interval sub-total level for the PTB Charge Code Adjustment (the Net Settlement Amount entered by PTB). This summation results in a Current Settlement Amount at the Charge Code Interval total level that is available to be used by both successor Charge Codes and the remaining hierarchy levels' calculations.

- At all remaining hierarchy levels for the Current Settlement Amount, the Charge Code total level, the Charge Group total level, the Parent Charge Group total, and the Settlement total represent both system generated and PTB totals.

As stated previously, a Business Associate only receives the values for its own Bill Determinants, Settlement Amounts, Billable Quantities, and Billable Prices (as well as CAISO totals). If one Business Associate has a PTB Charge Code Adjustment, although another Business Associate cannot tell which Business Associate, the reporting structure allows each Business Associate to determine (and validate) the impact amount (if any) by calculating the difference between its Current Amount at the Charge Code Interval Detail level and the Current Amount at the Charge Code Interval total level. The difference at the Business Associate level represents that Business Associate's share of the PTB Charge Code Adjustment and the difference at the CAISO level represents the total amount of the PTB Charge Code Adjustments for the all Business Associates in that interval.

3.3.3.4 Calculation Specifics - PTB Charge Adjustment

The calculation logic for Charge Codes that are adjusted by the PTB Charge Adjustment type is straightforward and can be presented in a conceptual manner using generic variable names. The equation in the next section depicts both the leveling and the methodology for summing the Current Settlement Amount for a Charge Code with the Net Settlement Amount for a PTB Charge Adjustment type.

ChargeCodeIntervalTotalSettlementAmount **B(mdhif)** =

ChargeCodeIntervalSubTotalSettlementAmount **B(mdhif)** +

PTBIntervalSubTotalChargeAdjustmentNetAmount **B(mdhif)**

Where

ChargeCodeIntervalSubTotalCurrentSettlementAmount **B(mdhif)** =

$$\sum_{(attribu)} \text{ChargeCodeIntervalDetailCurrentSettlementAmount}_{\mathbf{B(mdhif)(attributes)}}$$

And

PTBIntervalSubTotalChargeAdjustmentNetAmount **B(mdhif)** =

$$\sum_{J} \text{PTBIntervalDetailTotalChargeAdjustmentNetAmount}_{\mathbf{B(mdhif)J}}$$

And

PTBIntervalDetailTotalChargeAdjustmentNetAmount $_{\mathbf{B(mdhif)J}}$ =

PTBChargeAdjustmentNetAmount $_{\mathbf{B(mdhif)J}}$

Where

B – The Business Associated ID

(mdhif)- The Applicable Settlement Period for the Charge Code (i.e., – Trading Month m, Trading Day d, Trading Hour h, Settlement Interval I, Dispatch Interval f)

(attributes) - Are the relevant set of attributes applicable to the Charge Code

J - The unique PTB ID automatically set by the Settlement system

3.3.3.5 Calculation Specifics - PTB Allocation Adjustment

The calculation logic for Charge Codes that are adjusted by the PTB Allocation Adjustment type is slightly more complicated due to CAISO's requirement to maintain revenue neutrality. Additionally, the calculation logic must consider if any PTB Charge Adjustments exist on the predecessor Charge Code that feeds it. Like the PTB Charge Adjustment, the equation used when processing PTB Allocation Adjustment can also be presented in a conceptual manner using generic variable names. A numeric example of this equation is provided in **Attachment C - PTB Charge Code Adjustment Examples Part I and II.**

ChargeCodeIntervalTotalAllocationAmount $_{\mathbf{B(mdhif)}}$ =

ChargeCodeIntervalSubTotalAllocationAmount $_{\mathbf{B(mdhif)}}$ +

PTBIntervalSubTotalAllocationAdjustmentAmount $_{\mathbf{B(mdhif)}}$

Where

ChargeCodeIntervalSubTotalAllocationAmount $_{\mathbf{B(mdhif)}}$ =

UnadjustedChargeCodeIntervalTotalAllocationAmount $_{\mathbf{B(mdhif)}}$

Where

UnadjustedChargeCodeIntervalTotalAllocationAmount $_{\mathbf{B(mdhif)}}$ =

$$\sum_{(attribu)\{} \text{ChargeCodeIntervalDetailAllocationAmount}_{\mathbf{B(mdhif)(attributes)}}$$

And where

PTBIntervalSubTotalAllocationAdjustmentAmount $_{\mathbf{B(mdhif)}}$ =

PTBIntervalDetailTotalAllocationAdjustmentAmount $_{\mathbf{B(mdhif)}}$

And where

PTBIntervalDetailTotalAllocationAdjustmentAmount **B(mdhif)** =

PTBIntervalDetailTotalAllocationAdjustmentDeltaAmount **B(mdhif)** + ReallocationRatio **B(mdhif)** *

(CAISOTotalPTBChargeAdjustmentAmount **(mdhif)** –

CAISOTotalPTBAllocationAdjustmentDeltaAmount **(mdhif)**)

Where

CAISOTotalPTBChargeAdjustmentAmount **(mdhif)** = (- 1) *

$\sum_{B}$ PTBIntervalDetailTotalChargeAdjustmentAmount **B(mdhif)**

And where

CAISOTotalPTBAllocationAdjustmentDeltaAmount **(mdhif)** =

$\sum_{B}$ PTBIntervalDetailTotalAllocationAdjustmentDeltaAmount **B(mdhif)**

Where

PTBIntervalDetailTotalAllocationAdjustmentDeltaAmount **B(mdhif)** =

$\sum_{J}$ PTBAllocationAdjustmentDeltaAmount **B(mdhif)J**

And where

IF

CAISOTotalPTBUnadjustedAllocationAmount **(mdhif)** <> 0

THEN

ReallocationRatio **B(mdhif)** =

PTBUnadjustedAllocationAmount **B(mdhif)** / CAISOTotalPTBUnadjustedAllocationAmount **(mdhi)**

ELSE

ReallocationRatio **B(mdhif)** = 0

Where

CAISOTotalPTBUnadjustedAllocationAmount **(mdhif)** =

$$\sum_{B} \text{PTBUnadjustedAllocationAmount}_{\mathbf{B(mdhif)}}$$

And where

IF

$\text{PTBIntervalDetailTotalAllocationAdjustmentDeltaAmount}_{\mathbf{B(mdhif)}} = 0$

THEN

$\text{PTBUnadjustedAllocationAmount}_{\mathbf{B(mdhif)}} =$

$\text{UnadjustedChargeCodeIntervalTotalAllocationAmount}_{\mathbf{B(mdhif)}}$

ELSE

$\text{PTBUnadjustedAllocationAmount}_{\mathbf{B(mdhif)}} = 0$

3.4 Settlement Rounding

Due to the varying precision of Raw, Intermediate, and Final Bill Determinants, small imbalances may result between the total Settlement Amount paid/charged to Business Associates and the total Settlement Amount charged/received from Business Associates in a given set of Charge Codes. In order for CAISO to reach an accounting trail balance of zero in the course of the Settlement calculations, that is a revenue neutral position, in the event that charges calculated as due from CAISO Debtors are lower than payments calculated as due to the CAISO Creditors (or vice versa), the imbalance is allocated to Market Participants based on their proportional share of CAISO Measured Demand. Please reference the BPM Configuration Guides for Charge Codes 4989 and 4999 for specific calculation details.

3.5 Estimated Aggregate Liability

In order to determine credit risk for each Business Associate, the CAISO Finance group uses Settlement Statement results to calculate the Estimated Aggregate Liability (EAL) and required collateral.

All Settlement Statement results published on Initial or Recalculation Settlement Statements are used in the EAL determination process. Specific details regarding how CAISO Finance uses the Settlement Statement results to determine each Business Associate's collateral amount, how each Business Associate is to provide those collateral funds to the CAISO, and how a Business Associate can make inquiries about the collateral are provided in the *BPM for Credit Management*.

3.6 Meter Data Estimation

The Settlements engine will estimate meter data if CAISO did not receive estimated or actual meter data from Business Associate(s) in time for use in the Initial Market Run to generate the Initial Settlement Statement T + 9B. Business Associates can submit estimated or actual Settlement Quality Meter Data (SQMD) for each non-CAISO polled resource that the Business Associate represents at any time prior to the execution of the (daily or monthly) Initial Market Run. However, Business Associates must submit this file to the CAISO in accordance with the CAISO Payments Calendar. Estimated or actual SQMD must be submitted via the on-line Settlements Quality Meter Data system (SQMDS). This system is used so the processing mechanisms are consistent with the treatment for CAISO polled resources meter data.

For the Initial Market Run, the Settlements engine will estimate the missing data as a precursor to run execution. Hence the calculation equations (detailed below) are not included in the Configuration Output file. The calculation logic generates an estimated meter value for each missing measurement of a CAISO polled or non-CAISO polled resource that has not been submitted in accordance with the CAISO Payment Calendar. The estimation for each resource type is as follows:

- For a Load resource, including non-PTO load, the CAISO will use the value of each SCs Scheduled Demand, the MW of energy of Demand cleared through the IFM as set in the Day-Ahead schedule for the next Trading Day, by LAP and/or CLAP. This value will be increased by 15% if the total Actual System Demand (ASD) in Real Time (RT), as determined by the CAISO each hour, is greater than 15% of the Total Estimated Meter Demand (TEMD) at T + 9B. The scheduled demand for the Participating Loads will be exempted from the increase. Where, TEMD = value of SC submitted metered Demand + CAISO polled estimated SQMD + Scheduled Demand for unsubmitted metered Demand, available at T + 9B. For a Generation resource, the CAISO will use the RT Expected Energy value provided by the Market Quality System (MQS) – (minus) 0%. For a Resource Specific System Resource in the CAISO Balancing Authority Area, the CAISO will use the RT Expected Energy value provided by the Market Quality System (MQS) – (minus) 0%. A summary of these rules are as follows:

IF,	THEN,
ASD < TEMD	Estimated Metered Demand = SC Scheduled Demand
ASD > TEMD, by less than 15%	Estimated Metered Demand = SC Scheduled Demand
ASD > TEMD, by more than 15%	Estimated Metered Demand =SC Scheduled Demand plus 15% *

Where,

ASD = Total Actual System Demand: the total actual load determined by the CAISO in real time

TEMD = Total Estimated Metered Demand: SC submitted metered demand + CAISO polled estimated SQMD + Scheduled Demand for un-submitted metered demand

Participating Loads exempted from increase to Scheduled Demand

- For any Generating resource, estimated metered Generation will be based on expected energy, the total energy that is expected to be generated or consumed by a resource, based on the dispatch of that resource, as calculated by the RT Market (RTM) and modified by any applicable dispatch operating point corrections, for that resource ID.

- For a System Resource, the CAISO will use expected energy, the total energy that is expected to be generated or consumed by a resource, based on the dispatch of that resource, as calculated by the RT Market (RTM) and modified by any applicable dispatch operating point corrections, for that resource ID.

- For EIM Transfer System Resource, the CAISO will use the final Real Time Schedule.

- For net load for a Metered Subsystem (MSS) the CAISO will apply a monthly historical based net/gross ratio to the MSS's estimated gross load. The historical monthly ratio shall be specific to each MSS Operator and shall be calculated as the sum of each entity's monthly actual net load divided by the sum of each entity's monthly actual gross load, of the previous year.

- To the extent that an MSS Operator has Non-PTO load, the net load estimate as calculated above will be further split based on a weighted average of the previous year's Non-PTO wheeling load.

Estimated SQMD values are mapped to the same bill determinants as actual SQMD values. The only distinction between estimated and actual values is a flag that is generated as supporting data. The flag indicates whether the meter values utilized for estimated Settlements charges are based upon calculated values generated by the estimated meter process or values provided by SQMDS or theMarket Results Interface – Settlements (MRI-S). Additional supporting data generated by and utilized by the estimated meter calculation will also be included on the Initial Settlements Statements for validation purposes.

The estimated meter data is used along with all other available market and meter data applied during a Settlement Run to calculate Settlement charges and/or payments for all relevant daily,

monthly, and annual Charge Groups and Charge Codes. CAISO estimated SQMD is not used in any Recalculation Settlement Statement after the T+9B Initial statement. If SC submitted actual SQMD has not been received by the T + 52B deadline in time for the T+70B Recalculation Settlement Statement, then the CAISO estimated meter value used in the Initial Settlement Statement T + 9B is overwritten with zeros

3.6.1.1 Inputs to the Meter Data Estimation Calculation

Row #	Variable Name	Description
1	SQMDSIntefaceMeteredQuantity **Brtm'F'S'mdhcif**	Settlement Interval Metered Quantity for Business Associate B, Resource r, and Channel ID m' Meter values for the estimated meter calculation are represented by positive values. Note: The Estimated Meter Calculation occurs *prior* to the validation and mapping process, thus a minimal attribute set is required for meter estimation, and is represented as such in the calculation logic. The corresponding bill determinant generated during the validation and mapping process that represents SQMDSdata is defined by a larger attribute set.
2	SQMDSActualOrEstimateMeterFlag **Brtm'F'S'mdhcif**	Flag indicating meter data is either an estimated value or actual value for Business Associate B, Resource r, and Channel ID m' 'A' = Meter Value provided is an actual value. 'E' = Meter Value provided is an estimated value.
3	TotalExpectedEnergy **BrtF'S'hif**	Total Expected Energy (provided by MQS) for Business Associate B, Resource r, Resource type t, Entity Component Type F', Entity Component Subtype S', Trading Hour h, Settlement Interval i, Dispatch Interval f (MWh). Note: The Estimated Meter Calculation occurs *prior* to the validation and mapping process, thus a minimal

Row #	Variable Name	Description
		attribute set is required for meter estimation, and is represented as such in the calculation logic. The corresponding bill determinant generated during the validation and mapping process that represents Total Expected Energy is defined by a larger attribute set.
4	DALoadSchedule **BrtF'S'mdh**	DA IFM Load Schedule for Business Associate B and Resource r(MW) that includes Minimum Load, self-schedule quantity, and DA Energy quantity. Note: The Estimated Meter Calculation occurs *prior* to the validation and mapping process, thus a minimal attribute set is required for meter estimation, and is represented as such in the calculation logic. The corresponding bill determinant generated during the validation and mapping process that represents DA Load Schedule is defined by a larger attribute set.
5	EstimatedMeterAdder **t**	Represents a percentage value to compute Estimated Meter data when meter data does not exist for a given Resource Type t. The adder does not apply when the resource is a Generator. Standing Data with an effective date range for the applicable Trading Day.
6	PDRMeterFlag **Brtm'F'S'mdhcif**	Flag indicating PDR meter data is either an estimated value or actual value for Business Associate B, Resource r and Channel ID m'.. 'A' = Meter Value provided by MRI-S is an actual value. 'E' = Meter Value provided by MRI-S is an estimated value.

Row #	Variable Name	Description
7	BAResBaseLoadSchedule BrtF'S'mdh	The final Base Schedule for Load resources in an EIM Balancing Authority Area Note: The Estimated Meter Calculation occurs *prior* to the validation and mapping process, thus a minimal attribute set is required for meter estimation, and is represented as such in the calculation logic. The corresponding bill determinant generated during the validation and mapping process that represents DA Load Schedule is defined by a larger attribute set.
8	BAARTDIntertieEIMTransferQty rmdhcif	Balancing Authority Transfer RTD EIM Quantity for resource r and Pricing Node p This value is incremental to Base Schedule. (MW)

3.6.1.2 Estimation Calculation Equations

Formulas are presented in a bottom-up format. For instances where there is a schedule, but no meter value. This calculation occurs as a precursor to the Initial Market Run.

3.6.1.2.1 Initialization

Where meter values: SQMDSInterfaceMeteredQuantity **Brtm'F'S'mdhcif**

have been received the SQMDS, the corresponding meter flag shall indicate the source of the meter valueis SQMDS,

IF

SQMDSActualOrEstimateMeterFlag **BrtmF'S'mdhc**if = 'A'

THEN

MeterSourceFlag **Brtm'F'S'mdhcif** = 1

ELSE

IF

SQMDSActualOrEstimateMeterFlag **Brtm'F'Smdhcif** = 'E'

THEN

MeterSourceFlag **Brtm'F'S'mdhcif** = 2

OR

IF

PDRMeterFlag $_{Brtm'F'S'hi}$ = 'A'

THEN

PDRMeterSourceFlag $_{\mathbf{Brtm'F'S'mdhcif}}$ = 1

ELSE

IF

PDRMeterFlag $_{\mathbf{Brtm'F'S'mdhcif}}$ = 'E'

THEN

PDRMeterSourceFlag $_{\mathbf{Brtm'F'S'mdhcif}}$ = 2

Where Resource Type (t) = Generator or (Resource Type (t) = ITIE and Entity Component Type (F') = Tie Gen) Resource Type (t) = Generator or Tie Gen

IF

Corresponding meter value for TotalExpectedEnergyForMeterEstimate $_{\mathbf{BrtF'S'hi}}$ has not been received from SQMDSby T + 48B,

THEN

SQMDSInterfaceMeteredQuantity $_{\mathbf{Brtm'F'S'mdhcif}}$ = TotalExpectedEnergyForMeterEstimate $_{\mathbf{BrtF'S'mdhcif}}$ * (1 - EstimatedMeterAdder $_{\mathbf{t}}$)

Where m' = 4

AND

MeterSourceFlag $_{\mathbf{Brtm'F'S'mdhcif}}$ = 3

Where m' = 4

ELSE

SQMDSInterfaceMeteredQuantity $_{\mathbf{Brtm'F'S'mdhcif}}$ = 0

AND

MeterSourceFlag $_{\mathbf{Brtm'F'S'mdhcif}}$ = 4

Where Resource Type (t) = Generator and Entity Component Type (F') = PDR)

IF

Corresponding meter value for PDRMeterFlag $_{\mathbf{BrtF'S'mdhcif}}$ has not been received from MRI-S by T+48B

THEN

BAResEntityDispatchIntervalPerformanceMeteredQuantity **BrtuT'l'Q'M'AA'm'F'R'pPW'QS'd'Nz'VvHn'L'mdhcif** = TotalExpectedEnergyForMeterEstimate **BrtF'S'mdhcif** * (1 - EstimatedMeterAdder **t**)

Where m' = 4

AND

MeterSourceFlag **Brtm'F'S'mdhcif** = 3

Where m' = 4

ELSE

BAResEntityDispatchIntervalPerformanceMeteredQuantity **BrtuT'l'Q'M'AA'm'F'R'pPW'QS'd'Nz'VvHn'L'mdhcif** = 0

AND

MeterSourceFlag **Brtm'F'S'mdhcif** = 3

3.6.1.2.2 Where

TotalExpectedEnergyForMeterEstimate **BrtF'S'mdhcif** = $\sum_{f}$ TotalExpectedEnergy **BrtF'S'mdhcif**

3.6.1.2.3 Where

Resource Type (t) = Load

IF

Corresponding meter value for

SettlementIntervalDALoadScheduleForMeterEstimate **BrtF'S'mdhcif** has not been received,

THEN

SQMDSInterfaceMeteredQuantity **BrtF'S'm'mdhcif** = SettlementIntervalDALoadScheduleForMeterEstimate **BrtF'S'mdhcif** * (1 + EstimatedMeterAdder **t**)

Where m' = 1

AND

MeterSourceFlag **Brtm'F'S'mdhcif** = 3

Where m' = 1

3.6.1.2.4 Where

SettlementIntervalDALoadScheduleForMeterEstimate $_{\mathbf{BrtF'S'mdhcif}}$ =

DALoadSchedule $_{\mathbf{BrtF'S'mdh}}$ + BAResBaseLoadSchedule $_{BrtF'S'mdh}$)/ N

Where N = number Settlement Intervals per Trading Hour

3.6.1.2.5 Attributes Used

Attribute Symbol	Attribute Description
B	Business Associate ID
r	Resource ID
t	Resource Type
m'	Channel ID where Channel 1 is used to present energy demand, while channel 4 is used to present energy generation.
F'	Entity Component Type
S'	Entity Component Subtype
m	Trading Month
d	Trading Day
h	Trading Hour
c	FMM Interval
i	10-Minute Interval
f	Settlement Interval

3.6.1.3 Outputs to the Estimation Calculation

The outputs listed below will be provided to the calculations executed during the Initial Market Run and detailed on the Initial Settlement Statement.

Output Req ID	Name	Description
	Only the inputs listed below will be output by the stored procedure and passed to Settlements processing.	

Output Req ID	Name	Description
1	SQMDSInterfaceMeteredQuantity **Brtm'F'S'mdhcif**	Meter Data value generated by Estimated Meter Calculation that is subsequently validated, mapped, inserted into product tables, and applied in charge code and pre-calculations for Business Associate B, Resource r, and Channel ID m'. Note: The bill determinants subsequently created during the validation and mapping process will be defined by larger attribute sets where estimated and actual meter values are mapped to the same bill determinant. The bill determinant and attributes primarily representing generator and load resources (both estimated and actual) is BA_10M_RSRC_METER_QTY Generation energy is represented as a positive quantity and Channel ID m' = 4 while Demand energy is represented as a negative quantity and Channel ID m' = 1. The bill determinant primarily representing a Tie Gen resource (estimated and actual) is BA_10M_RSRC_INTERTIE_SCHD_QTY
2	MeterSourceFlag **Brtm'F'S'mdhcif**	Indicates meter value utilized for Estimated Settlements Liability was either a value generated by the Estimated Meter Calculation or a value provided by the SQMDS for Business Associate B, Resource r, and Channel ID m'.. Since estimated and actual meter quantities are mapped to the same bill determinants during the validation and mapping process, the MeterSourceFlag is provided to

Output Req ID	Name	Description
		identify the source of each meter quantity as follows: 1 = Meter Value utilized for Estimated Settlements Liability was provided by the SQMDS whereby the source is either a CAISO polled meter or SC submittal. 2 = Meter value utilized for Estimated Settlements Liability was an estimated value provided by the SQMDS. 3 = Meter value utilized for Estimated Settlements Liability was an estimated value generated by the Estimated Meter Calculation. 4 = If SC submitted actual SQMD has not been received by the T + 48B deadline, then the CAISO estimated meter value used in the Recalculation Settlement Statement T + 12B is overwritten with zeros
3	SettlementIntervalDALoadScheduleForMeterEstimate **BrtF'S'mdhcif**	DA IFM Load Schedule for Business Associate B and Resource r that includes Minimum Load, self-schedule quantity, and DA Energy quantity. The bill determinant and attributes generated by the validation and mapping process that represents the DA Schedule for a load resource is BA_HRLY_RSRC_DA_LOAD_SCHD_QTY where load is represented by a negative value.
4	TotalExpectedEnergyForMeterEstimate **BrtF'S'mdhcif**	Total Expected Energy quantity for Business Associate B and Resource r.

Output Req ID	Name	Description
		The bill determinant and attributes generated by the validation and mapping process that represents the Total Expected Energy (provided by MQS) is BA_5M_RSRC_TOTAL_EXP_ENGY_QTY
5	EstimatedMeterAdder **t**	Represents a percentage value to compute Estimated Meter data when meter data does not exist for a given Resource Type t. The adder does not apply when the resource is a Generator. Standing Data with an effective date range for the applicable Trading Day.
6	PDRMeterSourceFlag **Brtm'F'S'mdhcif**	Indicates meter value utilized for Estimated Settlements Liability was either a value generated by the Estimated Meter Calculation or a value provided by MRI-S for Business Associate B, Resource r, and Channel ID m'. Since estimated and actual meter quantities are mapped to the same bill determinants during the validation and mapping process, the MeterSourceFlag is provided to identify the source of each meter quantity as follows: 1 = Meter Value utilized for Estimated Settlements Liability was provided by MRI-S 2 = Meter value utilized for Estimated Settlements Liability was an estimated value provided by MRI-S. 3 = Meter value utilized for Estimated Settlements Liability was an estimated value generated by the Estimated Meter Calculation.

Output Req ID	Name	Description
		4 = If SC fails to submit SQMD by the T + 48B deadline, then the CAISO estimated meter value used in the Recalculation Settlement Statement T + 12B is overwritten with zeros
	DispatchIntervalCheckedOutInterchangeQuantity BrtEuT'I'Q'M'AA'R'pPW'Qd'Nz'OVvHn'L'qq'mdhcif	Represents the final (Real Time) Checked Out Dispatch Interval Interchange Schedule quantity (in MW) for all CISO and EIM system resources except pseudo gens
	DispatchIntervalCheckedOutDynamicInterchangeQuantity BrtEuT'I'Q'M'AA'R'pPW'Qd'Nz'OVvHn'L'qq'mdhcif	Reflects ISO polled meter data for Pseudo Generators
	BA5MEIMTransferFromTaggedQty ***BrtQ'AA'pF'S'Qmdhcif***	The Estimated Tagged From Quantity for EIM Transfer Resources
	BA5MEIMTransferToTaggedQty ***BrtQ'AA'pF'S'Qmdhcif***	The Estimated Tagged To Quantity for EIM Transfer Resources
	CRUSB_DispatchIntervalCheckedOutInterchangeQuantity SourceFlag	Indicates whether values for bill determinant CRUSB_DispatchIntervalCheckedOutInterchangeQuantity is estimated. The flag will have a value of 3 when meter data is estimated.

4. Billing & Invoice Process

Welcome to the *Billing & Invoice Process* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- A description of the billing and invoice runs and the types of runs
- How CAISO implements billing and invoice charge codes
- A description of the CAISO invoices

4.1 Billing

Billing is a Settlement process step that is transparent to Business Associates that serves as a preparatory validation point prior to the generation and publication of Invoices and Payment Advices. A Billing Run is defined as the periodic execution of specified summations of one or multiple Settlement Run Types in order to generate either current or revised result sets as needed for the activities associated with the Invoicing Cycle. The schedule associated with the execution of a Billing Run supports the CAISO Tariff authorized Invoicing Cycle.

A Billing Run is executed against a single Bill Period at a time and the resulting set contains the summation of all the Settlement Amounts for all Trading Days in the relevant Bill Period. The summation levels are consistent with what is described in Section 2.3.5.2 of this BPM as the standard hierarchy for Invoices and Payment Advices, with one exception. Since a Billing Run contains results for a single Bill Period, the hierarchy summations are executed to the Bill Period total level. The Invoice/Payment Advice total contains multiple Bill Periods, so this summation is executed exclusively in the Invoicing process.

A unique Billing Run is defined for each Settlement Run Type, called a Billing Run Type. The results of a Billing Run for a given Billing Run Type are used to verify Settlement Amount totals in preparation for Invoicing. A Billing Run Type exists in support of each for the following result sets:

Billing Run Type	Description of Output
Market Initial Billing Run	Initial billing run for all Initial Settlement Run Types for all Trading Days in the relevant Bill Period that include Charge Codes with the same Payment Date.

Billing Run Type	Description of Output
Market Recalculation Billing Run	Recalculation billing run for all Recalculation Settlement Run Types for all Trading Days in the relevant Bill Period that include Charge Codes with the same Payment Date.
Market Rerun Billing Run	Rerun billing run for all Rerun Settlement Run Types for all Trading Days in the relevant Bill Period that include Charge Codes with the same Payment Date.
Monthly RMR Initial Billing Run	Initial billing run for all RMR Contract Invoice amounts with the same Payment Date in accordance with the CAISO RMR Payment Calendar.
Monthly Shortfall Allocation Initial Billing	Initial run for Shortfall Allocation calculations that process CC 5910.
Monthly Market Historic	Billing run for the Market Historic Rerun Settlement Run Type for all Trading Days associated with the rerun period that includes Charge Codes with the same Payment Date.
Black Start Capability Initial Billing	Black Start Capability Initial Billing run for Black Start Customers.
Black Start Capability Recalculation Billing	Black Start Capability Recalculation Billing run for Black Start Customers
NERC/WECC Initial Billing	Initial billing run for the NERC/WECC Initial Settlement Run Type.
NERC/WECC Recalculation Billing	Recalculation billing run for the NERC/WECC Recalculation Settlement Run Type.
RC Services Initial Billing	RC Services Initial Billing run for RC Customers.
RC Services Recalculation Billing	RC Services Recalculation Billing run for RC Customers
TFR Initial Billing	Initial billing run for the TFR Initial Settlement Run Type.
TFR Recalculation Billing	Recalculation billing run for the TFR Recalculation Settlement Run Type.
HANA Billing	Billing run for HANA charges.
DAAS Billing	Billing run for DAAS charges.

As mentioned previously, outputs of the Billing process are not provided to Business Associates upon completion of a Billing Run. The outputs, once validated, are marked as “approved” to be included in the Invoicing process.

4.2 Invoicing Runs & Types

An Invoicing Run is defined as a periodic process that executes the summation of specified Billing Run Types for the purpose of generating Invoices and Payment Advices for one or multiple Bill Periods. During an Invoicing Run, approved Billing Run Type result sets are associated to a specific Invoice Run Type based on the Payment Date for the set of Charge

Codes included in the Billing Run. Only Charge Codes with the same Payment Date appear on a particular Invoice Run Type. Therefore, only Charge Codes with the same Payment Date are included in a given Billing Run Type and associated Settlement Run Type. In other words, a unique Invoicing Run is defined for each set of Charge Codes with the same Payment Date, called an Invoice Run Type. Since Invoicing Run Type is defined in this way, the terms Invoice Run Type or Invoice/Payment Advice Type are interchangeable.

The CAISO Tariff allows for different Payment Dates for the set of Charge Codes described below, therefore an Invoice/Payment Advice Type exists in support of the following:

Invoice / Payment Advice Type	Description of Output
Market Invoice/Payment Advice	Initial or Recalculation Billing Run Types containing Charge Codes that settle Market and administrative transactions (except FERC Fees that are payable annually).
Annual FERC Fee Invoice	Initial or Recalculation Billing Run Types containing Charge Codes that settle annual payment of FERC Fees for eligible Business Associates.
RMR Invoice/Payment Advice	Initial or Recalculation Billing Run Types containing Charge Codes that are used to settle costs incurred under RMR Contracts.
Shortfall Payment Advice Hold	Billing Run Type for Charge Code 5910 that is used to calculate AR balance hold amounts due to a Shortfall in funds due from CAISO Debtors.
Black Start Capability Invoice	Initial or Recalculation Billing Run Types for Black Start Capability Charge Codes
NERC/WECC Invoice	Initial or Recalculation Billing Run Types associated with settlement of NERC/WECC charges for the assessment year.
RC Services Invoice	Initial or Recalculation Billing Run Types for RC Services Charge Codes
HANA Invoice	Billing Run Types associated with HANA Charges.
DAAS Invoice	Billing Run Types associated with DAAS Charges.
TFR Invoice	Initial or Recalculation Billing Run Types associated with settlement of Transferred Frequency Response charges for the assessment year.

The **Charge Group & Parent Charge Group Specification** list attached in **Attachment B** itemizes all Charge Codes and the Invoice Run Type in which they are included.

The result set of each Invoice/Payment Advice Run Type is presented as Bill Determinants as described in Section 3.1 of this BPM. Since Invoices and Payment Advices only contain dollars, all Bill Determinants included only represent Settlement Amounts. Each publication of an

Invoice or Payment Advice also includes a cross-reference at the Bill Period total level to each version of each Settlement Run by Trading Day that is included in the Invoice or Payment Advice. Descriptions are included to indicate line items associated with 'INITIAL' result sets, 'RECALC' result sets, 'HISTORIC_INITIAL', or 'HISTORIC_RECALC' result sets. Additional contents and output structure for Invoices/Payment Advices is described in Section 2.3.5.2 of this BPM.

4.2.1 Market Invoice/Payment Advice

Market Invoices/Payment Advices are issued weekly as indicated in Section 2.3.5.1 of this BPM. Fund transfers required in association with these Invoices/Payment Advices are processed on the fourth (4th) business day from the issuance date in accordance with the details set out in Section 6 of this BPM. If the 4th business day falls on a CAISO holiday, then fund transfers occur on the next business day.

Charge Codes with the same Payment Date that settle CAISO Market and administrative transactions are included on the Market Invoice/Payment Advice Type. It is important to note that only Charge Code Settlement Amounts are included in a given Invoice or Payment Advice Type; Pre-calculations are excluded as the associated output is normally an Intermediate Bill Determinant used to feed a Charge Code calculation. Market Invoices/Payment Advices include Charge Code 550 Monthly FERC Fee and Charge Code 525 Yearly FERC Fee Over/Under Recovery. Charge Code 550 is payable monthly and Charge Code 525 is payable whenever a rate adjustment is calculated.

When Charge Code 525 for the Yearly FERC Fee Over/Under Recovery is calculated, Settlement Amounts payable are included on the next Invoice/Payment Advice to be published in the Invoicing Cycle as indicated on the CAISO Payment Calendar, regardless of the Business Associate's payment designation. Additional details regarding the calculation of Charge Code 525 and 550 are found in the associated BPM Configuration Guides.

Market Invoices or Payment Advices with a Net Settlement Amount between -$10.00 and +$10.00 are adjusted to $0.00 through a reversing line item transaction. This is done in accordance with CAISO Tariff Section 11.29.7.2.1 due to the fact that Fed Wire transaction costs exceed the cost of processing these low dollar Invoices/Payment Advices. This line item transaction is included on the impacted Invoice or Payment Advice indicating that no Settlement Amount is due to or from that Business Associate for that Invoice or Payment Advice.

4.2.2 Annual FERC Fee Invoice

Charge Code 551, for FERC charges due Annually are calculated at the same time as FERC charges due Monthly. However, payment on Settlement Amounts associated with CC 551 is not due until the year-end. Business Associates that meet the criteria as detailed in the

associated BPM Configuration Guide receive a separate Invoice (the Annual FERC Fee Invoice) at the same time the Market Invoice/Payment Advices are generated given the fact that the Payment Date is different.

The Payment Date for the Annual FERC Fee Invoice is stated on the Invoice. For those SC's paying on an annual basis, the FERC fee will appear on a separate Invoice with a due date of the 2nd week of July of the following year.

It is important to note that if a Business Associate's payment indicator status changes in the course of a trade year from the Annual designation to the Monthly payment designation, all FERC Fees calculated up to the point of the eligibility change are due in the next Invoicing Cycle as part of CC 550 Monthly FERC Fee.

Annual FERC Fee Invoices with a Net Settlement Amount under +$10.00 through to 0 (as Annual FERC Fee Invoices are normally a charge to Business Associates) are adjusted in the same manner as Market Invoices.

4.2.3 RMR Invoice/Payment Advice

For RMR Contract amounts settled under CC 3010 (detailed in BPM Configuration Guide for this Charge Code), CAISO prepares and publishes to each Responsible Utility and RMR Owner at least two Invoices and/or Payment Advices for each Trading Month in accordance with the CAISO RMR Payment Calendar.

The first publication for a Trading Month to a Responsible Utility and RMR Owner is the **Estimated Final Invoice or Payment Advice** and constitutes the basis for billing and associated automatic funds transfer in accordance with Attachment N, Part J of CAISO Tariff. This Estimated Final Invoice or Payment Advice for a Trading Month and specific facility is published on the calendar day detailed in the CAISO RMR Payment Calendar. The second is the **Adjusted Final Invoice or Payment Advice** and constitutes the basis for billing and associated automatic funds transfer in accordance with the CAISO Tariff. This Adjusted Final Invoice or Payment Advice for a Trading Month and specific facility is published on a calendar day detailed in the CAISO RMR Payment Calendar. The Payment Date and time for any RMR Invoice is 10:00am on the calendar date specified by the RMR Contract and detailed in the CAISO RMR Payment Calendar.

Each Invoice or Payment Advice to a Responsible Utility or RMR Owner represents a matched Accounts Receivable/Accounts Payable transaction for the specific facility as specified under CC 3010. The Invoices and Payment Advices for this matched transaction have the same Invoice number. The Estimated Final and the Adjusted Final Invoice or Payment Advice provide the Net Settlement Amounts that are to be paid by or to the relevant Responsible Utility and

RMR Owner based on the PTB Direct Charge input for the associated Trading Month available at the time scheduled in accordance with the CAISO RMR Payment Calendar.

RMR Contract Invoices and Payment Advices are externally netted and provided as an input value via PTB Direct Charge. Due to RMR Contract terms, RMR Invoices/Payment Advices with a Net Settlement Amount between -$10.00 and +$10.00 are not adjusted to $0.00.

RMR Contract related ad-hoc Invoices and Payment Advices can be generated as needed to account for Termination Fees that result from closing a facility. Such Invoices/Payment Advices for Termination Fees are processed as detailed in the BPM Configuration Guide for Charge Code 3010 and include a comment indicating that the value within the Invoice represents a Termination Fee. Responsible Utility or RMR Owner facilities with a Termination Fee Invoice and Payment Advice do not have an Estimated Final or Adjusted Final Invoice and Payment Advice for the same Trading Month.

4.2.4 Shortfall Payment Advice Hold

A Shortfall is the process or condition occurring when a CAISO Debtor defaults by failing to provide funds owed on an Invoice and CAISO must reduce amounts to be paid to CAISO Creditors proportionally to the net amounts payable to them on the relevant Payment Date. This is done to the extent necessary to clear the CAISO Clearing Account. This process is also initiated if a Business Associate that has been end-dated (for any reason) within a Trading Month does not remit a payment against the Initial Invoice generated for that Trading Month containing the end-dated Trading Day. Shortfall Charge Codes are treated as PTB Financial Adjustments, a subcategory of PTB Direct Charges in the Settlement system.

It is important to note that the processes detailed in Section 4.2.4 of this BPM as well as the Charge Codes stated below apply only to the Market Invoice Type. Any Shortfall or Default Interest applicable to an RMR Invoice or Payment Advice amount is processed as part of the PTB Direct Charge input for RMR Contract related charges in Charge Code 3010.

4.2.4.1 Shortfall Allocation

As detailed in the calculation rules for Charge Code 5910 in this BPM, if during the Financial Clearing process, CAISO has determined there is a CAISO Debtor(s) in default, and neither Business Associate Security amounts nor CAISO Reserve Account credits are sufficient to cover the Default Amount, CAISO initiates the Shortfall allocation process and associated calculations in support of the publication of supplemental Payment Advice Holds to CAISO Creditors.

The supplemental Payment Advice Hold generated due to non-payment by a CAISO Debtor includes a payment status of “Shortfall Hold” and is published on the same calendar day on which the Shortfall occurred, that is, the Payment Date.

4.2.4.2 Shortfall Receipt Distribution

As detailed in the calculation rules for Charge Code 5900 in this BPM, if during the Financial Clearing process, CAISO has determined a CAISO Debtor(s) has made a payment against a previous default, CAISO initiates the Shortfall Receipt Distribution process and associated calculations in support of processing payments to CAISO Creditors on the next Invoice or Payment Advice to be published in the Invoicing Cycle.

4.2.5 NERC/WECC Invoice

The CAISO invoices charges on behalf of the North American Electric Reliability Corporation/Western Electricity Coordinating Council (NERC/WECC) annually in accordance with tariff section 11.20. All settlement statement and invoice activities associated with NERC/WECC charges are accompanied by corresponding Market Notices.

Participants have sixty (60) calendar days to dispute their NERC/WECC Metered Demand quantity and ensure compliance with tariff section 11.20.4 (d). To facilitate this, the CAISO will attempt to provide a CD to each applicable Business Associated no later than the end of June of each calendar year detailing the NERC/WECC Metered Demand quantity for the calendar year two years prior to the NERC/WECC Charge Assessment Year.

Pending incorporation of any valid adjustments submitted via disputes for a Business Associate’s specific NERC/WECC Metered Demand quantity, the CAISO reports to WECC the total NERC/WECC Metered Demand quantity with itemized adjustments so that WECC can determine the actual NERC/WECC Charges to be invoiced to the CAISO for the assessment year.

Once the charges are provided by WECC, the CAISO issues a Market Notice with the preliminary NERC/WECC Charge Rate and publishes a NERC/WECC initial statement and the corresponding Invoice to each Business Associate for the NERC/WECC Charge Assessment Year. This statement and Invoice are published no later than August 31 in each calendar year and associated payments are due within thirty (30) calendar days of issuance.

Another Market Notice is sent by the CAISO within five (5) business days from the receipt of WECC’s invoice to the CAISO. This notice itemizes the final NERC/WECC Charge Rate as derived in accordance with tariff 11.20.4 (e). Utilizing the final rate, the CAISO issues a NERC/WECC recalculation statement and corresponding Invoice (for the same assessment year) to each Business Associate within fifteen (15) business days after the receipt of the

WECC invoice. Payments associated with this invoice are due within fifteen (15) business days of issuance.

As detailed in section 2.3.5.1.1 of this BPM, Business Associates have ten (10) calendar days from the date the NERC/WECC initial or recalculation statements and corresponding invoices are published to validate and dispute any mistral or typographical error. Without dispute, the statements and invoices will be deemed validated and are binding on the Business Associate.

Additional information on settlement for NERC/WECC charges can be found in the BPM Configuration Guide for Charge Code 6490 – NERC/WECC Charge.

4.2.6 RC Services Charge Invoice

As described in the **BPM for Reliability Coordination Services**, The CAISO will provide RC Customers with an RC Services Invoice by the first business day of each calendar year for RC Services to be provided during that calendar year.

RC Customers are required to make timely payment no later than twenty-one (21) business days from the date of the invoice unless otherwise specified in the RCSA. If payment is not received by the due date, the RC Customer will be charged a $1,000 one-time late payment fee on a supplemental invoice, and will be considered to be in default. For federal entity RC Customers, if the payment is not received by the due date of the invoice, the RC Customer will be assessed a $1,000 late payment fee for each instance of failure to pay by the due date.

In the event an RC Customer defaults on the payment of all or any portion of the charges included on an invoice, the CAISO RC may issue a supplemental invoice to all other RC Customers, reallocating any amounts unpaid by the defaulting RC Customer to all other RC Customers pro-rata based on billing volume data.

4.2.7 Black Start Capability Invoice

The CAISO will provide the applicable PTO with a Black Start capability invoice for each Trading Month of each calendar year.

Black Start capability and resource payments will be made to Black Start Generator. The CAISO will allocate harges for the aggregate payments to the associated PTO. On a monthly basis, for, the CAISO shall settle the fixed monthly Black Start capability payment plus any PTB Black Start cost recovery payments invoiced to the CAISO by the Black Start Generator (or the resource's registered SC).

Monthly Black Start invoices, both for the GO and PTO, shall be excluded from credit calls. Shortfall, default loss, and Estimated Aggregate Liability.

Additionally, Black Start invoices will be treated as "open" where the payments are not released unless all the charges are received from the applicable PTO.

4.2.8 HANA Invoice

The CAISO will invoice the RC Customer for their HANA services in advance of their anniversary date then every year thereafter on their anniversary date. Payment will be due within twenty-one (21) business days from the date of the invoice.

4.2.9 DAAS Invoice

The CAISO will invoice the EDAM Entity for their DAAS services in advance of their anniversary date then every year thereafter on their anniversary date. Payment will be due within twenty-one (21) business days from the date of the invoice.

4.2.10 Transferred Frequency Response (TFR) Invoice

The CAISO invoices charges for all legitimate costs invoiced to the CAISO by a Balancing Authority under a contract for Transferred Frequency Response (TFR) in accordance with tariff section 11.34. All settlement statement and invoice activities associated with TFR charges are accompanied by corresponding Market Notices.

Within five (5) business days after receiving the invoice for TFR charges, the CAISO shall issue a market notice setting forth the TFR charge rate for the assessment year, as derived in accordance with tariff section 11.34.2(a).

Within ten (10) business days after receiving the invoice for legitimate TFR costs, the CAISO shall issue an invoice to each Scheduling Coordinator for its allocable share of the TFR charges. Then, as detailed in section 2.3.5.1.1 of this BPM, each Scheduling Coordinator will have five (5) business days to review the charges on their invoice and shall deem those amounts valid unless a dispute is submitted in that timeframe. If the CAISO or SC determines that an invoice contains a typographical or other ministerial error, and the resolution of the error or dispute requires an adjustment, the CAISO will process the adjustment and issue a corrected invoice within 15 business days of the date the initial invoice was published.

Scheduling Coordinators must submit payment to the CAISO within fifteen (15) business days of the date the invoice is issued in accordance with tariff section 11.34.2(d). In the event a Scheduling Coordinator defaults on the payment of all or any portion of the Reliability Coordinator charges invoiced, the CAISO shall have the right under tariff section 11.29.13.3 to enforce the financial security provided by the defaulting Scheduling Coordinator, and to take any other action under tariff sections 11.29.12 or 11.29.13, as necessary, to obtain payment of the default amount.

To the extent all or any portion of the default amount remains unpaid, the CAISO may at its discretion issue an invoice for the unpaid TFR charges determined under tariff section 11.34.6(b).

Additional information on settlement for these charges can be found in the BPM Configuration Guide for Charge Code 7597 – Transferred Frequency Response Charge.

4.3 Charge Code Groupings for Invoicing

Charge Codes in the Settlement system are associated to specific Charge Groups and Parent Charge Groups. The associations are used to identify which Charge Codes the calculation engine sums to achieve the totals for the standard hierarchy levels discussed in Sections 2.3.3 and 2.3.5.2 of this BPM. This summation logic also supports the reporting and drill down capabilities from the Invoice/Payment Advice total to the Charge Code total for the relevant Bill Period and using Statement cross-references detailed above, from the Charge Code total for the Bill Period total to the Charge Code Total for each Trading Day within the Bill Period.

First, Charge Codes are grouped to Charge Groups. A Charge Group is a set of Charge Codes or Pre-calculations that meet a specific set of business rules. Those business rules are:

- Maintain CAISO neutrality on Payments and Charges
- Financially clear on the same Payment Date

Examples of Charge Groups include Upward Ancillary Services, Low Voltage Wheeling, Imbalance Energy, and Interest.

Next, Charge Groups are grouped to Parent Charge Groups. A Parent Charge Group is a unique set of Charge Groups with the same Payment Date and represents the main types of CAISO Market transactions for the purposes of output, Financial Clearing, business analysis, validation, reporting, or other logical business need. Examples of Parent Charge Groups include Ancillary Services, Access Charge, HASP/RT Settlement, and Financial Adjustments.

The **Charge Group & Parent Charge Group Specification** list attached in **Attachment B** itemizes all the Charge Codes with their associated *Parent Charge Group*, *Charge Groups*, *Settlement Amount Granularity*, as well as the *Invoice Run Type* in which they are included.

4.4 Invoice Rounding

The Settlement Amount output at each standard hierarchy level on each Invoice/Payment Advice Type is adjusted to a payable value of two (2) decimal places. However, the precision of Settlement calculations can be higher. Therefore, a rounding error attributable to moving from the Settlement calculation precision to the two decimals required for actual fund transfers can occur. Such Invoice rounding errors are output to the market clearing system to be eliminated by CAISO Accounting. The differences are eliminated against amounts held in the CAISO bank account.

4.5 Cancel Rebill

Market, Annual FERC, and Shortfall Payment Advice Hold Invoice or Payment Advice Types that are determined to be incorrect after publication but before financial clearing can be canceled through a full reversal of all Settlement Amount line items on the Invoice or Payment Advice and rebilled through a publication of new Invoices or Payment Advices.

Errors found in RMR Invoices and Payment Advices are not canceled and rebilled in this manner, but are manually reversed with an offsetting PTB input against the same Invoice number. Since multiple RMR Invoices with the same Payment Date are generated in a batch Invoicing Run, and the requirement to cancel normally applies only to one RMR Invoice, a cancelation of the entire Invoicing Run (and hence, of all Invoices and Payment Advices within that Run) is not an accurate method for processing.

When an Invoice/Payment Advice is canceled, the reversing Invoice/Payment Advice is published with an Invoice status of “Canceled” with the same Invoice number. CAISO will research and determine the source of the error, and communicate to Business Associates the course of action needed to correct and republish.

4.6 Business Associate Bankruptcy

4.6.1 Initial Bankruptcy Processing

The date and time when a Business Associate files for bankruptcy establishes the effective end-date and end-time for a bankrupt Business Associate ID in the CAISO Masterfile. This update occurs prior to executing the calculation for the Initial Settlement Run for that Trading Day.

It is important to note that Settlement results for any Settlement, Billing, or Invoicing Run are not generated for a Business Associate, bankrupt or otherwise, on a Trading Day (or Trading Hour) that is beyond the effective end-date and end-time specified in the CAISO Masterfile except for applicable month-end or annual Charge Codes. Month-end or annual Charge Codes for Business Associates that are end-dated (via bankruptcy or otherwise) include only those pre-end-dated (or pre-petition) Trading Days in the impacted Bill Period.

In the course of processing Settlement Statements and Invoices associated with the post-petition Trading Days, there are no additional processing steps associated with Bankruptcies.

4.6.2 Subsequent Recalculation Bankruptcy Processing

If a Settlement Rerun Adjustment is required on a pre-petition Trading Day, there are some changes to the Settlement and Invoicing processes in order to accommodate a Bankruptcy.

The “Bankruptcy Hold” status is applied to all Recalculation Settlement Run Types (and associated Billing and Invoicing Run Types) for a pre-petition Trading Day(s) that are scheduled to be executed on a calendar day that falls after the publication date of the first Recalculation Invoice/Payment Advice for the Bill Period that is associated with the bankrupt Trading Day. The need for this status is to separate the processing of pre-petition from post-petition Trading Days during the relevant Settlement, Billing, and Invoicing Runs.

This processing methodology helps to keep the funds of Business Associates that participated in CAISO Market transactions on post-petition Trading Days separate from funds for Business Associates that participated in CAISO Market transactions on pre-petition Trading Days. Therefore on an Invoice calendar day, a Business Associate may receive two Invoices/Payment Advices, one containing pre-petition Trading Days and one containing post-petition Trading Days, when if there were no Bankruptcy, the Business Associate would receive only one Invoice/Payment Advice, which contains multiple Bill Periods.

5. Dispute Processes

Welcome to the *Dispute Processes* section of the *BPM for Settlements & Billing*. In this section, you will find the following information:

- A brief overview of disputes
- Details on the methods with which disputes can be submitted
- The content requirements for disputes
- Processing requirements for Placeholder disputes
- Dispute allowances on Settlement Rerun Adjustments

5.1 Dispute Overview

As stated in previous sections, CAISO publishes settlements charges to Business Associates on versions of both Initial and Recalculation Settlement Statements. Business Associates have the opportunity to validate these statements and dispute discrepancies that are found that are based on either data differences or policy implementation issues. CAISO evaluates submitted disputes to determine the corrective action required. If CAISO believes that an adjustment is needed, it makes the necessary changes to correct the resulting settlements. If CAISO believes an adjustment is not warranted, it then provides an appropriate explanation to the Business Associate.

The timelines associated with these activities are detailed in Section 2.3.5.1 of this BPM and supported by CAISO Tariff Section 11.29.8. If a Business Associate submits a dispute after these timeframes, it is rejected and closed.

5.2 Dispute Submittal Methods

Disputes should be submitted electronically through the Customer Inquiry Dispute and Information (CIDI) system.

CIDI is the mechanism by which work performed on disputes is documented, routed, and tracked through CAISO. The CIDI system assigns generic numerical IDs for each dispute for tracking purposes. Work Log entries within the dispute ticket are required in order to share relevant data and activities for resolution of the dispute.

If the system is unavailable or a Business Associate is awaiting access approval to the system, disputes may be submitted via email to the ISO Dispute Mailbox (isodispute@caiso.com) using Attachment D the Settlement Dispute Form template. CAISO monitors the ISO Dispute mailbox

for manual dispute submittals and enters them into the system on the Business Associate's behalf until such time that the system becomes available to the Business Associate.

5.3 Dispute Content Requirements

The CAISO Tariff Section 11 and sections 5.1 and 2.3.5.1.2 of this BPM summarize the minimum content requirements for dispute submittal in terms of the method of dispute notification, timeliness of dispute submittal, and minimum information and justification that must be submitted in the dispute. In addition to the dispute content requirements, disputes must be submitted in accordance with the timelines and disputability rules defined by Tariff as summarized in section 2.3.5.1.1 of this BPM. Disputes filed outside of the timelines and rules are considered non-compliant with the CAISO Tariff and will be rejected and closed.

Dispute submittals that do not meet the CAISO Tariff defined minimum requirements are not viewed by CAISO as formal disputes and are deemed non-compliant with the CAISO Tariff as insufficient information was provided to process the dispute. Non-compliant disputes are rejected by CAISO.

When CAISO determines a dispute is non-compliant, it notifies the Business Associate through CIDI and if CIDI is unavailable via email. if the dispute deadline has not passed to provide an opportunity for the submission of the additional information before the deadline. Since Business Associates are not able to amend the dispute description in their Settlement Dispute ticket after it has been submitted into CIDI, they must e-mail any additional information to ISO Dispute Mailbox (isodispute@caiso.com) for attachment to the ticket.

If the Business Associate does not submit the lacking information by the follow up date provided the dispute is rejected as not Tariff compliant, CAISO staff completes the necessary fields in CIDI, and closes the dispute ticket.

5.4 Placeholder Disputes

The CAISO Tariff allows Placeholder Disputes in cases where a dispute issue regularly recurs on future versions of Initial and Recalculation Settlement Statements. A Placeholder Dispute preserves a Business Associate's right to dispute an item on a Settlement Statement that affect calculations in subsequent Settlement Statements. Placeholder Disputes are valid for a limited, specified time, specifically:

- The Trading Day indicated in the CAISO's Placeholder Dispute granted response, or
- Ninety (90) days have elapsed,

5.4.1 Eligibility Requirements for a Placeholder Dispute

The designation of a dispute to Placeholder Dispute status may only occur, if the Business Associate meets one of the following eligibility criteria:

- The Business Associate requests a placeholder status and provides details supporting that the issue is recurring. To the extent possible the request should state the type of charges and dates to which the dispute will apply, and provide estimates of the amounts that will likely to be claimed on such dates.The Business Associate shall continue to raise a dispute until the CAISO approves the placeholder request.
- CAISO receives a dispute and as the result has identified a recurring systemic issue, and therefore converts the existing dispute to a Placeholder Dispute, notifying the Business Associateeliminating the need for the Business Associate to submit a Placeholder Dispute. In this case, CAISO completes the Placeholder Dispute .

5.4.2 CAISO Placeholder Authorization Policy

If the Business Associate's eligibility criterion is met, then CAISO can designate a dispute as recurring and authorize a Placeholder Dispute when:

- CAISO policy is yet to be determined
- CAISO's policy and/or Tariff interpretation is determined and communicated, and the participant continues to disagree with interpretation, application, or content of the CAISO Tariff
- CAISO requires additional time to research the issue
- CAISO recognizes the issue as valid but is unable to correct the problem immediately due to system limitations, required software changes, and/or resource availability

5.4.3 Placeholder Processing

CAISO processes the incoming Placeholder Dispute request submitted via CIDI, and determines whether CAISO may be able to authorize a Placeholder Dispute based on whether the request falls within the policy. CAISO has five (5) business days upon receipt of the request to respond to the Business Associate.

5.5 Dispute Evaluation Process

The CAISO's manual process of evaluating and closing every settlement dispute begins immediately following the receipt of a dispute submittal. The CAISO initially reviews each dispute submittal to determine whether it has been submitted in a timely fashion, and meets

applicable tariff and BPM guidelines. Disputes that do not meet these requirements are rejected. The CAISO provides a written response to the disputing party stating the reason for the dispute rejection.

For disputes that are deemed to meet the tariff and BPM requirements for dispute submittal, the CAISO next reviews the description of the dispute along with the supporting information supplied in it to identify the specific dispute issue. The information supplied with the dispute may be compared to information captured in various CAISO databases, and may be considered in conjunction with applicable tariff provisions and CAISO business documentation, to determine whether or not the dispute issue is valid. Other information utilized in the analysis of disputes includes, but is not limited to, SLIC Logs and Outage information, phone recordings, and application database logs. Based on this review, the CAISO determines whether each dispute is approved or denied no later than 31 business days after the end of the dispute period for that settlement statement with the exception of complex disputes or unless otherwise agreed to by the disputing Business Associate. The CAISO provides a written response to the disputing party that explains the outcome of a resolved dispute. The CAISO strives to resolve disputes on the subsequent statement.

Complex settlement statement disputes involve policy considerations, entail extensive research, require granular review of previous market runs, include complicated data or calculations, or depend on additional information to be provided by the disputing Scheduling Coordinator or a third party. The CAISO makes every reasonable effort to gather the appropriate data, analyze the issue, determine the validity of the dispute, and implement any necessary corrections or adjustments on a timely basis to resolve these complex disputes. The CAISO will advise the disputing Scheduling Coordinator within thirty-one (31) business days after the end of the dispute period for that settlement statement if a dispute is a complex dispute. The CAISO targets resolving complex disputes no later than Recalculation Settlement Statement scheduled to be published at T+11M for the disputes on an Initial Settlement Statement T+9B; no later than Recalculation Settlement Statement scheduled to be published at T+21M for the disputes on a Recalculation Settlement Statement T+70B or a Recalculation Settlement Statement T+11M or an Unscheduled Recalculation Settlement Statement.

In addition, there is a limited category of disputes that depend on the outcome of a FERC proceeding to achieve final resolution. The CAISO maintains these disputes as open matters until the FERC Order resolving the matter becomes final and non-appealable. If the FERC Order is not issued or does not become final and non-appealable by T+24M, the CAISO at that time closes the dispute in accordance with the sunset provision in the Tariff. Even though the dispute is closed, the matter is subsequently resolved consistent with the requirements of the FERC Order when it is later issued.

6. Financial Processes & Clearing

Welcome to the *Financial Processes & Clearing* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- A discussion of the funds transfer processes into and out of CAISO Bank Accounts including relevant timelines
- Where to find information on processes that impact Financial clearing, such as Business Associate name or bank account changes
- Information regarding calculations executed by the market clearing system, specifically, the Default Interest charges and allocation

The scope of the content included in this section of the BPM is limited to Market Participants and RC Customers that are an existing Business Associate, meaning, it does not cover the processes associated when establishing or changing a Business Associate name or account. Additionally, information regarding the establishment of Collateral is not covered here. Information regarding the processing to follow when establishing or changing a Business Associate name or bank account, or FED Wire transfer process is covered in the *BPM for Scheduling Coordinator Certification and Termination*. Information on Collateral requirements is provided in the CAISO Tariff *as well as the BPM for Credit Management*.

6.1 Financial Clearing

6.1.1 Funds Transfer for Payments in to CAISO

The following provides specifics regarding the funds transfer process for payments in to the CAISO.

6.1.1.1 Payment Date & Time

For all Invoice Types, each CAISO Debtor remits to CAISO Clearing Account by Fed Wire the net amount shown on the Invoice as payable by that CAISO Debtor. The amount owing must be received no later than 10:00 am on the Payment Date to the account number as indicated on the Invoice. If any CAISO Debtor becomes aware that a payment is not, or is unlikely to be, remitted to the CAISO Bank by 10:00 am (prevailing California time) on the relevant Payment Date for any reason (including failure of the Fed-Wire or any computer system), it is to notify CAISO immediately, and give full details of the payment delay (including the reasons for the payment delay). The CAISO Debtor makes all reasonable efforts to remit payment as soon as possible, by an alternative method if necessary, to ensure that funds are received for value no later than 10:00 am on the Payment Date, or as soon as possible thereafter. Funds are applied

such that the Grid Management Charge is paid first in full, in accordance with CAISO Tariff section 11.29.9.6.1.

6.1.1.2 Late or Non-Payments to CAISO

In the event that payments are not received by 10:00 am on the Payment Date, CAISO offsets any payments due the Business Associate with any amounts due to CAISO. In addition, CAISO transfers such amounts held in a Business Associate's CAISO security deposit account to the CAISO Clearing Account as provided in Tariff Section 11.29.3. If it is not possible to clear the CAISO Clearing Account on a Payment Date because of an insufficiency of allowable funds available in the Reserve Account or by enforcing any guarantee, letter of credit, or other credit support provided by a defaulting Business Associate, then CAISO initiates the Shortfall Allocation process as detailed under Charge Code 5910 in this BPM. During this process, CAISO reduces payments to all CAISO Creditors proportionately to the net amounts payable to them on the relevant Payment Date to the extent necessary to clear the CAISO Clearing Account as provided in Tariff Section 11.29.17.1.3 and generates a supplemental Invoice that states the amount CAISO is unable to pay CAISO Creditors.

Provisions for and settlement of penalties associated with late invoice payments are outlined in Section 8.2 of the *BPM for Credit Management* and the BPM Configuration Guide for Charge Code 5024 Invoice Late Payment Penalty.

6.1.1.3 Payments Received against a Prior Shortfall

As detailed in CAISO Tariff Section 11.29.17.2, upon payment by a CAISO Debtor against a previous default amount, the collection of defaulted receivables initiates the Shortfall Receipt Distribution process as described under Charge Code 5900 in this BPM. In this process, amounts received are distributed following a priority order to CAISO Creditors. The amount is distributed pro rata against the net amount for the Payment Advice that was originally short paid.

6.1.2 Funds Transfer for Payments to Business Associates

Payments against a Payment Advice are made to Business Associates via Fed Wire. CAISO makes payments to the relevant bank accounts maintained by the CAISO Creditors as soon as practical or within five business days of the collection date as indicated in the CAISO Payments Calendar. Every attempt is made to make payments prior to 2:30 pm (prevailing California time) on the relevant Payment Date as long as all relevant payments are received from the CAISO Debtors.

6.1.3 Market Notices

A summary of the Financial Clearing for the relevant Settlement Date is sent out electronically to all Business Associates via a Market Notice. The content of the summary includes activity of total amounts billed, total amounts collected, total amounts paid, and a list of Business Associate names that are in default for the Bill Period.

6.2 Financial Processes

The details regarding the Fed Wire testing for establishing or changing Business Associate names or bank accounts are provided in the *BPM for Scheduling Coordinator Certification & Termination.* Testing processes involve a temporary change in the market clearing system until CAISO successfully completes the Fed Wire test. Upon successful validation that the name and/or bank account change is operational, the changes become permanent.

6.3 Financial Calculations

The following provides a summary of finance related calculations.

6.3.1 Default Interest

Default Interest is charged to CAISO Debtors that have defaulted on an Invoice necessitating a Shortfall Allocation. Interest is calculated by the Invoice default balance, the amount of days the Invoice is in default, and by a rate posted by FERC on its website. Collections of default interest shall be distributed pro rata to CAISO Creditors for the Bill Period where the default occurred. Default Interest amounts to be charged or allocated to Business Associates is processed through PTB Financial Adjustments in CC 2999 and CC 3999. The process logic associated with PTB Financial Adjustments is described in Section 3.3.1 of this BPM. The Charge Codes are described in the BPM Configuration Guides for each Charge Code.

6.3.2 FERC Mandated Interest

Additional Interest amounts owing to or from Business Associates can be ordered by FERC as a result of a recalculation of settlement results. In these instances, the amount of Interest is calculated as indicated in the BPM Configuration Guide for CC 5999.

6.3.3 Invoice Deviation Interest

Invoice deviation Interest ensures that the time value of money is accounted for when Business Associates initially overcharge or undercharge due to estimated Meter Data, updates to SQMD Meter Data, and price adjustments on Invoices/Payment Advices.

Deviation interest is calculated on a daily basis against the deltas between each successive daily settlement statement for a given Trading Day (initial to recalculation, recalculation to recalculation), corresponding to the payment dates of the invoice upon which these amounts appear. The interest amount that is charged or paid will be accrued back to the payment date of the Invoice that contains the relevant Initial Settlement Statement. Deviation interest amounts are settled through Charge Code 7989 Invoice Deviation Interest Distribution and 7999 Invoice Deviation Interest Allocation and will appear on the next available Invoice. The detailed calculation rules for these Charge Codes can be found in the associated BPM Configuration Guide.

6.3.4 Invoice and Collateral Late Payment Penalties

Both invoice and collateral late payment penalties are calculated by the ISO's Finance Department and provided to settlements as a Pass-Through Bill (PTB) to be included in the next available Market settlement, billing and invoicing processes.

An Invoice Late Payment Penalty will be assessed to Market Participants who are late in paying their invoices and a Collateral Late Payment Penalty will be assessed to Market Participants who fail to post collateral within the prescribed timeframe. The specific calculation rules for the these Charge Codes, 5024 Invoice Late Payment Penalty and 5025 Collateral Late Payment Penalty, can be found in the associated BPM Configuration Guides as well as the *BPM for Credit Management*.

7. Emergency Procedures & Processes

Welcome to the *Emergency Procedures & Processes* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- The documentation requirements needed for contingency events
- The revision of Settlement Statement and/or Invoice or Payment Advice publication dates as well as dispute and payment timelines during a contingency event

7.1 Documentation

In order to continue business functions related to calculating and publishing the Settlement Statements and/or Invoices or Payment Advices, CAISO maintains internal process documentation that dictate the procedures to follow during any contingency event. These procedures are continually updated and maintained by Settlements personnel in accordance with internal emergency operations planning and at a minimum cover the following:

- Recovery tenants for each business unit with the Market Services department
- Possible contingency events and associated response activities for each
- Use of System fallback procedures and alternative work locations (AWL)
- Internal and external communication plan details for contingency events

7.2 Delayed Publication of Settlement Statements and/or Invoices/Payment Advices

In accordance with CAISO Tariff Section 11.29.10.1 through 11.29.10.5, CAISO may generate and publish estimated Settlement Statements and Invoices/Payment Advices during a contingency event based on estimated data. The process for payments against estimated Invoices/Payment Advices is also provided in these CAISO Tariff sections and any additional details such as the method chosen to produce estimated data, Settlement Statements, and Invoices will be published on the CAISO website on an as needed basis.

A Contingency event may include, but is not limited to a failure of any CAISO software. In the event that the production Settlement system fails, prior to using estimated data, the Billing and Settlements unit falls back to a redundant system or utilize the AWLs to generate Settlement Statements and/or Invoices or Payment Advices. In the event that the worksite is inaccessible, contingency procedures are used to transfer work efforts to the AWL in order to continue with daily business functions.

In either case, if the contingency event results in a breach of CAISO Tariff defined publication deadlines for Settlement Statements and/or Invoices/Payment Advices, the Billing and Settlements unit provides a status to the appropriate CAISO department(s) to initiate communications with Business Associates. Communications includes the revised publication dates and/or times for the impacted Settlement Statements and/or Invoices or Payment Advices, as well as revised timelines associated with dispute submittals and/or Payment Dates.

As the current CAISO Tariff deadline for both Settlement Statements and Invoices/Payment Advices is midnight, extensions of time for dispute submittal or funds transfer for payment coincides with the length of the delay in transmitting either document set.

8. Understanding BPM Configuration Guides

Welcome to the *Understanding BPM Configuration Guides* section of the *BPM for Settlements & Billing*. In this section, you find the following information:

- A general description of the presentation of the Charge Codes and Pre-calculations
- A description of the subscript conventions that are used in the sections that cover the Charge Codes and Pre-calculations

In the remaining sections of this BPM, the material is devoted to describing the presentation of the calculation rules executed within the CAISO Settlement system. These calculation rules are provided in documentation called BPM Configuration Guides, which specify the requirements for both design and implementation of various Charge Codes and Pre-calculations in the Settlement system.

A Charge Code BPM Configuration Guide provides the calculation logic requirements associated with Charge Codes. A Pre-calculation BPM Configuration Guide provides the calculation logic requirements associated with a key Intermediate Bill Determinant that is used in a subsequent Pre-calculation or a Charge Code.

A list of all the Charge Code and Pre-calculation Configuration Guides is included in **Attachment E**. The Pre-calculations and Charge Code guides are presented in the same manner as detailed in the remaining sections of this BPM. Note that the capitalization of variables and/or Charge Code/Pre-calculation names is intended for readability only; this capitalization is not meant to imply defined terms and the terms are not listed in the BPM for Definitions and Acronyms.

8.1 Content Details

For each Pre-calculation or Charge Code BPM Configuration Guide, the following components are included:

- **Introduction**: The Introduction section provides the **Background** information and a summary **Description**.
  - **Background:** The first section provides context and/or a brief history of the Charge Code or Pre-calculation and how it relates to other Charge Codes and/or Pre-calculations.
  - **Description**: These introductory paragraphs present a description of the Pre-calculation or Charge Code including its function and what is being calculated and/or settled.

- **Charge Code Requirements**: This section provides the Business Rules, Predecessor Charge Codes, Successor Charge Codes, Inputs, CAISO Formula, and the Outputs.
  - **Business Rules**: This subsection presents the business rules that are applied in the development of the Charge Code or Pre-calculation covered in the section. Please note that the Business Rules table includes a column titled "Bus Req ID". Entries in this column of the table provide an indication of the hierarchy of the Business Rules included in the table. For a rule that is a subset of a previous rule, the ID for that rule is shown as a subset by adding an additional level to the ID.
    - For example, if a rule is a subset of the previous rule 2.0, then its ID is 2.1. If there are additional rules that are a subset of 2.0 they are numbered 2.2, 2.3., etc. This hierarchy is included to clarify the relationship between the various business rules for the Charge Code or Pre-calculation covered in the section.
  - **Predecessor Charge Codes:** This subsection tabulates the Charge Codes and/or Pre-calculations whose calculation logic must be executed before the calculation of the subject Charge Code or Pre-calculation can begin..
  - **Successor Charge Codes:** This subsection tabulates the Charge Codes and/or Pre-calculations whose calculation logic can only be executed after the calculation of the subject Charge Code or Pre-calculation has been completed
  - **Inputs – External Systems:** This subsection tabulates the input variables (and their associated description) to the Charge Code or Pre-calculation, which come from an external source (outside of the Settlement system). External inputs can be sourced from other CAISO systems, including the Oracle Financial systems, other CAISO Market systems, the CRR system, or they can be sourced as Pass Through Billing data.
    - The scope of the Settlements and Billing BPM can be delimited by the External Input variables. All calculation logic and processes used to derive the values associated with the External Inputs to a Settlement calculation are not covered in this BPM.
  - **Inputs – Predecessor Charge Code or Pre-calculations**: This subsection tabulates the input variables (and their associated description) to the subject Charge Code or Pre-calculation, which come from an internal source (inside the Settlement system). In other words, items in this table are predecessors that must be calculated before the calculation of the subject Charge Code.
  - **CAISO Formula**: This subsection provides the equations that calculate key outputs associated with the relevant Charge Code or Pre-calculation. Equations are ordered sequentially from the output to the input starting with the final charge calculation and

progressively detailing the intermediate calculations and settlement inputs. In other words, calculations start with the highest-level output required down to the lowest-level or raw inputs resulting in a tree-type structure. See Section 8.3.1 of this BPM for a more detailed discussion of calculation formulas.

- **Outputs** – This subsection provides all calculation outputs that are made available for use in a subsequent Charge Code, Pre-calculation equation, or for purposes of publication on a settlement statement. In addition to the specific outputs listed, all inputs to a Charge Code or Pre-calculation equation are also provided as outputs.

- **Charge Code Effective Date:** This section provides a summary of each Document Version for the Charge Code, the Effective Start and End Dates of each version, and the associated Version Update Type. The Effective Start and End Dates are defined with Trading Days and the Version Update Type can be a 'Documentation Only' change or a 'Configuration Impacted' change. 'Configuration Impacted' changes result in a new release of code to calculate the specified Charge Code, but 'Documentation Only' changes do not result in a new release of code. Version numbers for 'Documentation Only' changes are incremented by letter whereas 'Configuration Impacted' changes are incremented by number.

8.2 Sign & Subscript Conventions

8.2.1 Sign Conventions

In general, Energy schedules, Real Time Instructed Imbalance Energy, and metered quantities associated with load and export resources are represented as negative values in the Settlements system. The sign conversion of market data for load and export resources is established prior to the initiation of a Settlement Run. Real Time Instructed Imbalance Energy is incremental to the Day Ahead Schedule, and as such decremental energy for an export resource is represented as a positive value. Ancillary Service, RUC, and No Pay quantities for export or participating load resources are represented as positive values.

Inverse signing convention is applied to pumping energy before these values by upstream systems and therefore the sign convention remains unchanged in Settlements.

With respect to the Real-Time Deemed Delivered Energy from Interchange schedules provided to the Settlements system, export quantities represented as negative values and imports are represented by positive values.

8.2.2 Subscript Conventions

Subscripts are notations against a particular variable in a formula that defines the granularity of the associated value. Subscripts may also be referred to as "attributes." Examples of subscripts or attributes include the Business Associate ID, Location ID, APNode, Energy type,

exception flag, etc. The **Design Standards and Conventions** technical document posted on the CAISO website details the subscripts and associated definitions used in Charge Code and Pre-calculation equations.

8.3 Charge Codes & Pre-calculations

8.3.1 Calculation Structure & Approach

This section is used to present the method that is used for writing the mathematical equations for the relevant Charge Code or Pre-calculation in each BPM Configuration Guide. The following details provide some guidelines to reading and understanding these formulas.

As stated above, formulas are ordered logically from the top-down. The equations start with the highest-level output required down to the lowest-level or raw inputs resulting in a tree-type structure. For Charge Codes the highest-level output (typically) is the Settlement Amount. The Settlement Amount is a payment or charge to the relevant entity based on the granularity and settlement principles as specified in the CAISO Tariff. The term ***"Settlement Amount"*** is only used for the value that is used to show the financial obligation on a published Invoice.

As an example, the majority of Settlement calculations start (at the highest output level) with some derivative of the following. Formulas are numbered according to the BPM Configuration Guide section in which they are defined (3.6):

3.6.1 Settlement Amount $_{\text{subscripts}}$ = ***Billable Quantity*** $_{\text{subscripts}}$ * ***Price*** $_{\text{subscripts}}$

To the extent that the variables within the Settlement Amount formula are not raw inputs (that is, inputs from a system outside of Settlements or a predecessor Settlement calculation), the calculation levels must continue to be defined with supporting formulas until the lowest level is reached (that is, until all calculations are defined down to the raw input). In terms of the "tree," each variable is defined down the raw input and then the next variable is addressed. Using the above example, the Billable Quantity is defined down to the lowest level (i.e., raw input) and then the Price is defined it all the way down to the lowest level.

Elaborating on the example above, if both the Billable Quantity and the Price are not raw inputs, subsequent formulas in the "tree" are structured as follows:

3.6.1.1 Where

Billable Quantity $_{\text{subscripts}}$ = MAX (0, (***VariableA*** $_{\text{subscripts}}$ - ***RawInputY*** $_{\text{subscripts}}$)) + ***VariableC*** $_{\text{subscripts}}$)

3.6.1.1.1 Where

VariableA $_{subscripts}$ = ***Raw InputX*** $_{subscripts}$ / ***Total Raw InputX*** $_{subscripts}$

3.6.1.1.2 Where

Total Raw InputX $_{subscripts} = \sum_{subscrip} $ ***Raw InputX*** $_{subscripts}$

3.6.1.1.3 Where

VariableC $_{subscripts}$ = min(0, (***Raw InputZ*** $_{subscripts}$ + ***Raw InputQ*** $_{subscripts}$))

3.6.1.2 Where

Price $_{subscripts}$ = MAX (***Raw Bid Price*** $_{subscripts}$, ***Raw MCP*** $_{subscripts}$)

It is important to note that at the Settlement Amount level, sign conventions are consistent with what is used today as + due CAISO and – due BA. The sign conventions for the variables assumed in the various equations are stated in the description section for the relevant input or output table for each Charge Code or Pre-calculation.

Variable terms used in the written equation are capitalized for readability and not intended to become defined terms. All variable inputs and outputs for each Charge Code and Pre-calculation are described in the associated tables. The variable names used in a formula accurately convey the nature of the value that is represented by the name. These names may closely resemble the Bill Determinant name. As mentioned previously, a Bill Determinant matrix that is integrated into the configuration output file provides a listing of the Bill Determinant names and a mapping of the Configuration Guide variable name to the Bill Determinant name.

For Pre-calculations, the equation structure is the same as that which is described above for a Charge Code (ultimate output down to raw input) with the highest-level output being the variable or key Bill Determinant that is provided to one or more successor calculations.

9. Technical Documentation Reference Matrix

The following provides a reference to and description of key settlement technical documentation available on caiso.com:

Item & Link	Description
Settlements Page	Documents and reference links for information on settlement concepts and process.
Charge Code Matrix	Reference listing of all Settlement Charge Codes that provides a brief description of the key billable quantity as well as the types of Business Associate or RC Customer categories to which each Charge Code would apply.
Payment Calendar	Provides the deadline by trade date and calendar date associated with meter data submittal, statement publication, invoice publication, and cash clearing.
RC Services Payment Calendar	Provides deadlines by calendar year associated with billing data volume submittal, statement and invoice publication, and payment due dates.
BPM Attachment B – Charge Group and Parent Group Spec	Provides a listing of all settlement Charge Codes (and supporting Pre-calculations) that are calculated by the Settlements engine by effective date. It includes information about PTB applicability, Charge Group and Parent Charge Group grouping, and a cross-reference to the applicable CAISO Tariff section heading.
Settlement Release Artifact Milestones	Provides a depiction of and information about the settlement release paths, specifying the different artifact delivery milestone and deployment timing.
Technical documents	
Settlements Configuration File	Draft and production versions of the xml output which specifies the formulation of all calculations performed within the settlements engine.
Settlements Design Standards	On the Setlements Page under '*Settlements technical documentation*" Provides design standards, naming conventions, attribute positions and data mapping information applicable to the development of calculations within the settlement engine.
Settlements Interface Specifications	Provides the XSD and XML information required by application programmers to download and process settlement files.
MRI Settlements User Guide	Provides an overview of the Market Results Interface (MRI) for Settlements which is the mechanism by which SCs search, select and download Settlement files

10. RC Services, HANA and DAAS Charge Applicability

Generally, the BPM for Settlements and Billing is applicable to the settlement of RC Services charges, HANA charges and DAAS charges except as detailed below. For the purposes set forth in this BPM, the term "Business Associate" also applies to RC Services, HANA and DAAS Customers. The following sections of this BPM for Settlements and Billing do not apply to RC Services, HANA or DAAS:

Section 2.1.4 Financial Clearing Process

Section 3.4 Settlement Rounding

Section 3.5 Estimated Aggregate Liability

Section 3.6 Meter Data Estimation

Section 4.6 Business Associate Bankruptcy

Section 5 Dispute Process – Does not apply in general. There are separate rules for RC Services as outlined in the **RC Services BPM** Section 12.4. Sections 5.2 and 5.3 are applicable in terms of dispute submittal method and content.

Section 6.1.1.2 Late or Non-payments to CAISO - Separate processes are found in the **RC Services BPM** Section 12.3.

Section 6.1.3 Market Notices

Section 6.3 Financial Processes - There is a separate process for RC Services as outlined in the **RC Services BPM** Section 12.3.