



# Settlements Interface Specification for Scheduling Coordinators

Version 4.5

Mar 14, 2018

**Revision History**

<b>Date</b>	<b>Version</b>	<b>Description</b>
January 12, 2004	1.0	Initial version
March 2, 2004	1.1	Refinements for Areva and SaMC User Group feedback
October 20, 2004	1.2	Draft SaMC External Market Participant Interface Specification
November 3, 2004	1.3	Implemented spelling and grammar corrections and consistencies. Changed document name to Draft SaMC Interface Specification for Scheduling Coordinators
November 12, 2004	1.4	Updated for final QA of interfaces and to expand and clarify descriptions.
February 27, 2005	1.5	Clarified settlement statement and added configuration output
March 8, 2005	1.6	Clarified notes for MarketStatementLineItem.intervalNumber in the data mapping table, section 6.3.4.4  Correct entity name to BillDeterminant.numberInterval
July 20, 2005	1.7	Removed chargeGroupName and majorGroupName from ChargeType class in Configuration Output File  Removed elements from mapping table that were listed as "not used"  Updated address classes include address in addressGeneral  Added SettlementConfiguration.source  Removed SchedulingCoordinator.name and Invoice.description from the Charge Component Class  Updated end of section 6.2.1 to not suppress data when Net Amounts equal zero.
August 29, 2005	1.8	Removed elements from Statement RTOErpAddress class.  Removed Attribute Property Classes listed as "not used" from Configuration Output mapping table.



May 27, 2006	2.0	<p>Updated for SaMC MRTU Release and eterrasettlements release 2.2.2.</p> <p>Update Statement xsd descriptions for redesign.</p> <p>Removed Stage 1 references, and included additional updates for MRTU</p> <p>Referenced Business Practice Manuals for supporting information to replace Business Practice Manuals</p>
June 30, 2006	2.1	<p>Removed "Draft" from header</p> <p>Removed Ch. 5 (xml standards and overview)</p> <p>Removed section 2.5 (SaMC Implementation Timeline)</p> <p>Edited Mapping Table Sections</p> <p>Attached updated sample xsds</p>
July 21, 2006	2.2	<p>Added BillDeterminant.mrid to BillDeterminantData.xsd</p> <p>Added PTB.ChargeProfile.BillDeterminant.mrid to StatementData.xsd</p> <p>Added ChargeComponent.BillDeterminant.mrid to SettlementConfiguration.xsd</p> <p>Updated xsds with items listed as "outstanding" in previous delivery</p> <p>SettlementData xsd:</p> <ol style="list-style-type: none"> <li>1) Added PTB ChargeProfile</li> <li>2) Added PTB ActivityRecord.remarks</li> <li>3) Added PTB BillDeterminant.name</li> </ol> <p>InvoiceData XSD</p> <ol style="list-style-type: none"> <li>1) Added Activity Record</li> <li>2) Added RTO erpPerson class</li> <li>3) Added PTB Attribute</li> </ol>
March 9, 2007	3.0	<p>Removed sections that are now covered in the BPMs or already covered in other sections of this specification. The sections removed are the following:</p> <ul style="list-style-type: none"> <li>• Ch. 2: SaMC Overview</li> <li>• Ch. 3: Key SaMC Concepts</li> <li>• Ch. 4: SaMC Proposed Interfaces</li> </ul>



		<ul style="list-style-type: none"><li>• Ch. 8: PTB Input Format</li></ul> <p>Changed the layout of the document to be more consistent with other CAISO MRTU interface specifications.</p> <p>Created separate Bill Determinant mapping tables to distinguish the bill determinant elements that will be contained in the statement vs. the bill determinant files.</p> <p>Updated the Communication Protocol to include SFTP for all output files.</p> <p>SettlementData mapping table updated to match xsd (these include updates for the new xsd as well as updating inconsistencies with past deliveries:</p> <ol style="list-style-type: none"><li>1) Added MarketStatementLineItem.name @ Trade Date Level</li><li>2) Removed MarketStatementLineItem.intervalCount @ non interval levels</li><li>3) Removed MarketStatementLineItem.Intervaldate @ Parent Charge Group Level</li><li>4) Added MarketStatementLineItem.uom @ Interval Levels</li><li>5) Replaced AttributeList with Attribute @Interval Levels</li><li>6) Corrected Upper/Lower case usage to match xsd</li><li>7) Updated sample data for MarketStatementLineItem.ChargeProfileData.Data.int to reflect the change in data type from an integer to dateTime.</li><li>8) Removed MarketStatementLineItem.tradeDate</li></ol> <p>BillDeterminantData mapping table updated to match xsd</p> <ol style="list-style-type: none"><li>1) Updated sample data for BillDeterminantData.int to reflect the change in data type from an integer to dateTime</li></ol>
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		<p>2) Removed BillDeterminantData.tradeDate</p> <p>Inserted new StatementData.xsd and BillDeterminant.xsd</p> <ol style="list-style-type: none"> <li>1. StatementData.xsd updates include changing the data type for MarketStatementLineItem.ChargeProfileData.Data.int and removing MarketStatementLineItem.tradeDate</li> <li>2. BillDeterminant.xsd updates include changing the data type for BillDeterminant.Data.int and removing BillDeterminant.tradeDate</li> </ol>
June 28, 2007	3.1	<p>Inserted new SettlementConfiguration.xsd</p> <ol style="list-style-type: none"> <li>1) <a href="http://www.caiso.com/soa/2007-03-10/settlementConfigurations.xsd">http://www.caiso.com/soa/2007-03-10/settlementConfigurations.xsd</a></li> </ol>
September 18, 2007	3.2	<p>Enhanced the IndexA reference element and underlying attribute in the settlements file.</p> <p>Added IndexA reference element and underlying attribute in the bill determinants file.</p> <p>Added a CCode (Charge Code) reference to the bill determinant file.</p>
March 28, 2008	3.3	Updated the file name format for all output files to SFTP.
June 16, 2008	3.4	Updated file name format for all output files to BAPI and SFTP
June 27, 2008	3.4	Updated file name format for all output files to BAPI and SFTP, added Reissue statement type
July 28, 2008	3.5	<p>Inserted new StatementData.xsd</p> <ul style="list-style-type: none"> <li>• <a href="http://caiso.com/1c9c/1c9c86e711a90.html">http://caiso.com/1c9c/1c9c86e711a90.html</a></li> </ul> <p>Updated file name format for TAC Rate, Monthly Initial Credit and Monthly Rerun Market files</p>
August 25, 2008	3.6	<p>Inserted new BillDeterminant.xsd</p> <ol style="list-style-type: none"> <li>1. BillDeterminantData.xsd updates to include PTBComments and requires change in namespace</li> </ol>
March 31, 2009	3.7	<ul style="list-style-type: none"> <li>• Updated new invoicedata.xsd with a new namespace</li> <li>• Inserted Invoice file name for RMR invoice</li> </ul>



October 01, 2009	3.8	<ul style="list-style-type: none"> <li>Updated market statement – “HISTORIC_INITIAL_MARKET” AND “HISTORIC_RECALC_MARKET”</li> </ul>
August 05, 2010	3.9	<ul style="list-style-type: none"> <li>Updated market statement – “DAILY_RERUN_MARKET” AND “MONTHLY_RERUN_MARKET”</li> <li>File Format with timestamp</li> <li>Short Fall Invoice</li> </ul>
February 23, 2011	3.10	<ul style="list-style-type: none"> <li>Updated Element Table for Configuration Output: clarified property/Value description/enumeration of Charge Type Attribute Property</li> <li>Removed embedded xsd files in Sections 2.8.6, 3.8.5, 4.8.5, added URLs to xsd files posted on CAISO website in Section 1.3.</li> <li>Replaced xsd schema encoding in Sections 2.8.4, 2.8.5, 3.8.4, 4.8.4 with reference to xsd files posted on CAISO website in Section 1.3</li> </ul>
June 6, 2011	3.11	<ul style="list-style-type: none"> <li>Updated to include NERC/WECC Statements and Invoice Types.</li> </ul>
July 11, 2011	3.12	<ul style="list-style-type: none"> <li>Updated the doctype for the Statements (section 2.8.3.1) and for Invoice Settlement.docTitle (section 3.8.3)</li> </ul>
Oct 4, 2011	3.13	<ul style="list-style-type: none"> <li>Updated to include NERC WECC INFO statement</li> </ul>
Jan 18, 2012	3.14	<ul style="list-style-type: none"> <li>Updated the file name to include the Generated Date and time stamp for the file name and the Posted date and time stamp for the zip files</li> </ul>
Jan 24, 2012	3.15	<ul style="list-style-type: none"> <li>Update the file name for the Invoices to include the time stamp.</li> </ul>
Sep 12, 2012	4.0	<ul style="list-style-type: none"> <li>Update the Specification to reflect standardization of nomenclature of files for MRI application and SFTP.</li> </ul>
Feb 7, 2013	4.1	<ul style="list-style-type: none"> <li>Update the specification to reflect file name change from Posted Time stamp to Generated Time Stamp</li> </ul>
Jul 31, 2015	4.2	<ul style="list-style-type: none"> <li>Updated to include Peak statements and invoice</li> </ul>
May 10, 2016	4.3	<ul style="list-style-type: none"> <li>Updated to include Transferred Frequency Response statements and invoice</li> </ul>



Feb 01, 2017	4.4	<ul style="list-style-type: none"><li>Updated Section 1.3 Related Documents URL</li></ul>
Mar 14, 2018	4.5	<ul style="list-style-type: none"><li>Updated Section 2.6.3 Splitting CAISO Determinant files</li></ul>

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# 1 Introduction

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## 1.1 Purpose

This document describes the Market Participant interface for CAISOs Billing and Settlement system. It provides the XSD and XML information required by application programmers to download and process settlement files.

## 1.2 Contact Information

For any questions regarding this document please send email to [SaMCUsers@caiso.com](mailto:SaMCUsers@caiso.com)

## 1.3 Related Documents

Doc. No.	Document Name	Location
1	Business Practice Manual for Settlements & Billing	<a href="https://bpmcm.caiso.com/Pages/SnBBPMDetails.aspx?BPM=Settlements%20and%20Billing">https://bpmcm.caiso.com/Pages/SnBBPMDetails.aspx?BPM=Settlements%20and%20Billing</a>
2	SaMC Bill Determinant Matrix	<a href="http://www.caiso.com/Documents/ISOMarketChargeCodesMatrix.xls">http://www.caiso.com/Documents/ISOMarketChargeCodesMatrix.xls</a>
3	StatementData.xsd	<a href="http://www.caiso.com/Documents/StatementData_xsd_Updated24-Jul-2008_.xsd">http://www.caiso.com/Documents/StatementData_xsd_Updated24-Jul-2008_.xsd</a>
4	BillDeterminantData.xsd	<a href="http://www.caiso.com/Documents/BillDeterminantData_xsd_Updated25-Aug-2008_.xsd">http://www.caiso.com/Documents/BillDeterminantData_xsd_Updated25-Aug-2008_.xsd</a>
5	InvoiceData.xsd	<a href="http://www.caiso.com/Documents/InvoiceData_xsd.xsd">http://www.caiso.com/Documents/InvoiceData_xsd.xsd</a>
6	SettlementConfiguration.xsd	<a href="http://www.caiso.com/Documents/SettlementConfiguration_xsd.xsd">http://www.caiso.com/Documents/SettlementConfiguration_xsd.xsd</a>

## 2 Statement XML Payloads

### 2.1 Description

The settlement statement is designed to meet Scheduling Coordinator (SC) requirements for timely and accurate data of California ISO settlement charges and payments. The Statement is designed to cover:

- Settlement charges by interval for each charge type, summarized by Charge Group and Parent Charge Group
- Bill determinant input and intermediate calculations for use by SC s to validate charges
- PTB adjustment transactions by charge type

A settlement statement is broken out into three separate payloads for each settlement run. The three payloads for each settlement run include the following:

- Settlement Amount File - Contains SC specific charge code amount totals.
- SC Bill Determinant File – Contains SC specific bill determinant quantities and prices that were used as input to calculate charge code amounts.
- CAISO Bill Determinant File – Contains CAISO bill determinant prices, rates, and quantities that were used as input to calculate charge code amounts and are common to all participants. One file will be produced per settlement run for the entire market to consume.

Statements are produced each time settlements are run. California ISO will review and validate outputs before they are published to SC s. Recalculation runs include a true up of quantities, prices and amounts with the previously settled run.

Statements are produced by trade date for:

- Credit estimate
- Initial settlement
- Recalculation settlement
- Rerun settlement
- Historic Rerun settlement
- Other special settlements, such as NERC WECC, Shortfall etc.

Monthly charges appear on the settlement statement for the last day of the Trading Month. Statements are versioned by trade date and run type at time of run execution, and to ensure there is no doubt which settlement statement versions have been invoiced, the invoice contains cross-reference to the settlement version invoiced by trade date.

PTB inputs and results are reported in settlement statements, and in the case of financial adjustments, are separately itemized on the invoice in the corresponding bill period.

- PTB Bill header details are separately reported in settlement statements
- Underlying quantities and amounts are included as specific Bill Determinant inputs in settlement statements with a source of PTB

Financial adjustments will be individually itemized on invoices with reference to the invoices being adjusted if prior period.

Each recalculation statement will include a full set of data. For example, data will not be suppressed when Net Amounts equal zero.

### 2.2 Purpose



Settlement statements are the key-supporting documents to the invoice and which contain charge code totals and supporting input data used in settlement calculations.

## 2.3 Frequency

Statements are produced daily for the runs completed that day. SCs can expect to receive a minimum of four statements per day for the Initial settlement, Recalculation settlement (2), and Rerun settlement. Credit estimate may or may not apply. The number of statements will vary day to day based on the CAISO Payment Calendar. A SC could receive ten or more statements in a day, depending on the timing of holidays and statement publication. All statements are a complete execution of all charge codes and Bill Determinants. Please refer to the Settlements Process section of the Business Practice Manual for Settlements and Billing, for a description scheduling and timing of settlement runs.

## 2.4 Communication Network

The files will be available to download over the Internet by utilizing the CAISO Portal.

## 2.5 Communication Protocol

The communication protocol for manually downloading files from the CAISO Portal will be HTTPS. In addition to manual downloads, the CAISO will support an automated API via SFTP.

## 2.6 File names

Settlement Statement file names contain a unique run number, a corresponding version number, and a posting date timestamp. The posting date timestamp represents the day and time that the statement files were posted on the CAISO Portal.

The zip files available on Market Result Interface - Settlements (MRI) and Secure File Transfer Protocol (SFTP) will contain the posting date timestamp.

The run number represents a unique sequence of numbers which identify the specific calculation run as executed by the settlements software.

The version number represents the number of times that calculation run has executed for the same Trading Day and Settlement Run Type. Version numbers are incremented by one (1) against the version number of the immediately preceding published Settlement Statement for the same Trading Day and Settlement Run Type.

### 2.6.1 SETTLEMENT AMOUNT FILE-

#### Market Result Interface - Settlements (MRI) and Secure File Transfer Protocol (SFTP)

Format –

*SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-PostingDateand timestamp*. i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050326-200504020811.xml.zip"

*SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp*. i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050326-200504011813.xml"

The following are examples of the file names that will be posted to MRI and SFTP:

- Daily Initial Credit

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_INITIAL\_CREDIT-1-APPROVED-20050326-200504020811.xml"

- Daily Initial Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050329-200504060811.xml"

- Daily Recalc Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_RECALC\_MARKET-1-APPROVED-20050326-200504020811.xml"

- Historic Initial Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-HISTORIC\_INITIAL\_MARKET-1-APPROVED-20050326-200504020811.xml"

- Historic Recalc Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-HISTORIC\_Recalc\_MARKET-1-APPROVED-20050326-200504020811.xml"

- Daily Rerun Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-DAILY\_RERUN\_MARKET-1-APPROVED-20050326-200504020811.xml"

- Monthly Initial Credit

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-MONTHLY\_INITIAL\_CREDIT-1-APPROVED-20050301-200506020811.xml"

- Monthly Initial Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-MONTHLY\_INITIAL\_MARKET-1-APPROVED-20050301-200506020811.xml"

- Monthly Recalc Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD -SETTLEMENT-2012041112-MONTHLY\_RECALC\_MARKET-1-APPROVED-20050301-200508020811.xml"

- Monthly Rerun Market

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-MONTHLY\_RERUN\_MARKET-1-APPROVED-20050201-200509020811.xml"

- TAC Rate

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-SETTLEMENT-2012041112-TAC\_RATE-1-APPROVED-20050301-20050602.xml"

- NERC\_WECC\_INITIAL

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2011053112-NERC\_WECC\_INITIAL-1-APPROVED-20100801-20110802.xml"

- NERC\_WECC\_RECALC

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2011053112-NERC\_WECC\_RECALC-2-APPROVED-20100801-20110802.xml"

- Peak Initial

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2015011052-PEAK\_INITIAL-1-APPROVED-20140101-201511051616.xml"

- Peak Recalc

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2015011052-PEAK\_RECALC-1-APPROVED-20140101-201511051616.xml"

- Transferred Frequency Response Initial

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2017011052-TFR\_INITIAL-1-APPROVED-20150101-201711061622.xml"

- Transferred Frequency Response Recalc

Format *SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e " ABCD-SETTLEMENT-2017011052-TFR\_RECALC-1-APPROVED-20150101-201711061622.xml"

## 2.6.2 SC BILL DETERMINANT FILE-

### Market Result Interface - Settlements (MRI) and Secure File Transfer Protocol (SFTP)

Format –

*SCID-DETERMINANTS-RunNumber-SettlementType-Version-Status-TradeDate- PostingDateand timestamp*. i.e. " ABCD-DETERMINANTS-2012041112- DAILY\_INITIAL\_MARKET -1-APPROVED-20050326-200504030720.xml.zip"

*SCID-DETERMINANTS-RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp*. i.e. " ABCD-DETERMINANTS-2012041112- DAILY\_INITIAL\_MARKET -1-APPROVED-20050326-200504020811.xml"

The following are examples of the file names that will be posted to MRI and SFTP:

- Daily Initial Credit

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-GeneratedDateandtimestamp* i.e. " ABCD- DETERMINANTS -

2012041112-DAILY\_INITIAL\_CREDIT-1-APPROVED-20050326-200504020811.xml”

- Daily Initial Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS -2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050329-200504060811.xml”

- Daily Recalc Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS -2012041112-DAILY\_RECALC\_MARKET-1-APPROVED-20050326-200504020811.xml”

- Daily Rerun Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS -2012041112-DAILY\_RERUN\_MARKET-1-APPROVED-20050326-200504020811.xml”

- Monthly Initial Credit

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS -2012041112-MONTHLY\_INITIAL\_CREDIT-1-APPROVED-20050301-200506020811.xml”

- Historic Initial Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-SETTLEMENT-2012041112-HISTORIC\_INITIAL\_MARKET-1-APPROVED-20050326-200504020811.xml”

- Historic Recalc Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-SETTLEMENT-2012041112-HISTORIC\_Recalc\_MARKET-1-APPROVED-20050326-200504020811.xml”

- Monthly Initial Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS -2012041112-MONTHLY\_INITIAL\_MARKET-1-APPROVED-20050301-200506020811.xml”

- Monthly Recalc Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS -2012041112-MONTHLY\_RECALC\_MARKET-1-APPROVED-20050301-200508020811.xml"

- Monthly Rerun Market

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS -2012041112-MONTHLY\_RERUN\_MARKET-1-APPROVED-20050201-200509020811.xml"

- NERC WECC INFO

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS-2011090113-NERC\_WECC\_INFO-4-APPROVED-20110601-200509020811.xml"

- NERC WECC Initial

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS-2011090113-NERC\_WECC\_INITIAL-1-APPROVED-20110601-200509020811.xml"

- NERC WECC Recalc

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS-2011090113-NERC\_WECC\_RECALC-1-APPROVED-20110601-200509020811.xml"

- Peak Initial

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS-2015011052-PEAK\_INITIAL-1-APPROVED-20140101-201511051616.xml"

- Peak Recalc

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-DETERMINANTS-2015011052-PEAK\_RECALC-1-APPROVED-20140101-201511051616.xml"

- Transferred Frequency Response Initial

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. " ABCD-

DETERMINANTS-2017011052-TFR\_INITIAL-1-APPROVED-20150101-201711061622.xml”

- Transferred Frequency Response Recalc

Format *SCID- DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” ABCD-DETERMINANTS-2017011052-TFR\_RECASC-1-APPROVED-20150101-201711061622.xml”

### 2.6.3 CAISO BILL DETERMINANT FILE-

The CAISO Bill Determinants file will be split into multiple files. All files will be made public and will be published under the CISO SC ID in order to make them accessible to all market participants.

The existing file containing the common bill determinants will remain intact for the CAISO market participants and will have the bill determinants used for the settlement of the CAISO market. File name and the format will remain the same.

Format: *CISO-DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” CISO-DETERMINANTS -2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050329-200504060811.xml”

There will be separate common files created for each of the EIM entities, and will contain bill determinants that are specific to each of these EIM entities. These BDs specific to the EIM entities will no longer be included in the main CISO BD file. The file name for the EIM BAA file will follow the format specified below:

Format: *CISO\_<EIM/BAA>-DETERMINANTS -RunNumber-SettlementType-Version-Status-TradeDate-GeneratedDateandtimestamp* i.e. ” CISO\_AZPS-DETERMINANTS -2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050329-200504060811.xml”  
CISO\_PACW-DETERMINANTS -2012041112-DAILY\_INITIAL\_MARKET-1-APPROVED-20050329-200504060811.xml”

## 2.7 Error Handling

In the event that statements are incorrect, new statements with the next version for the trade date will be issued, overriding the incorrect version.

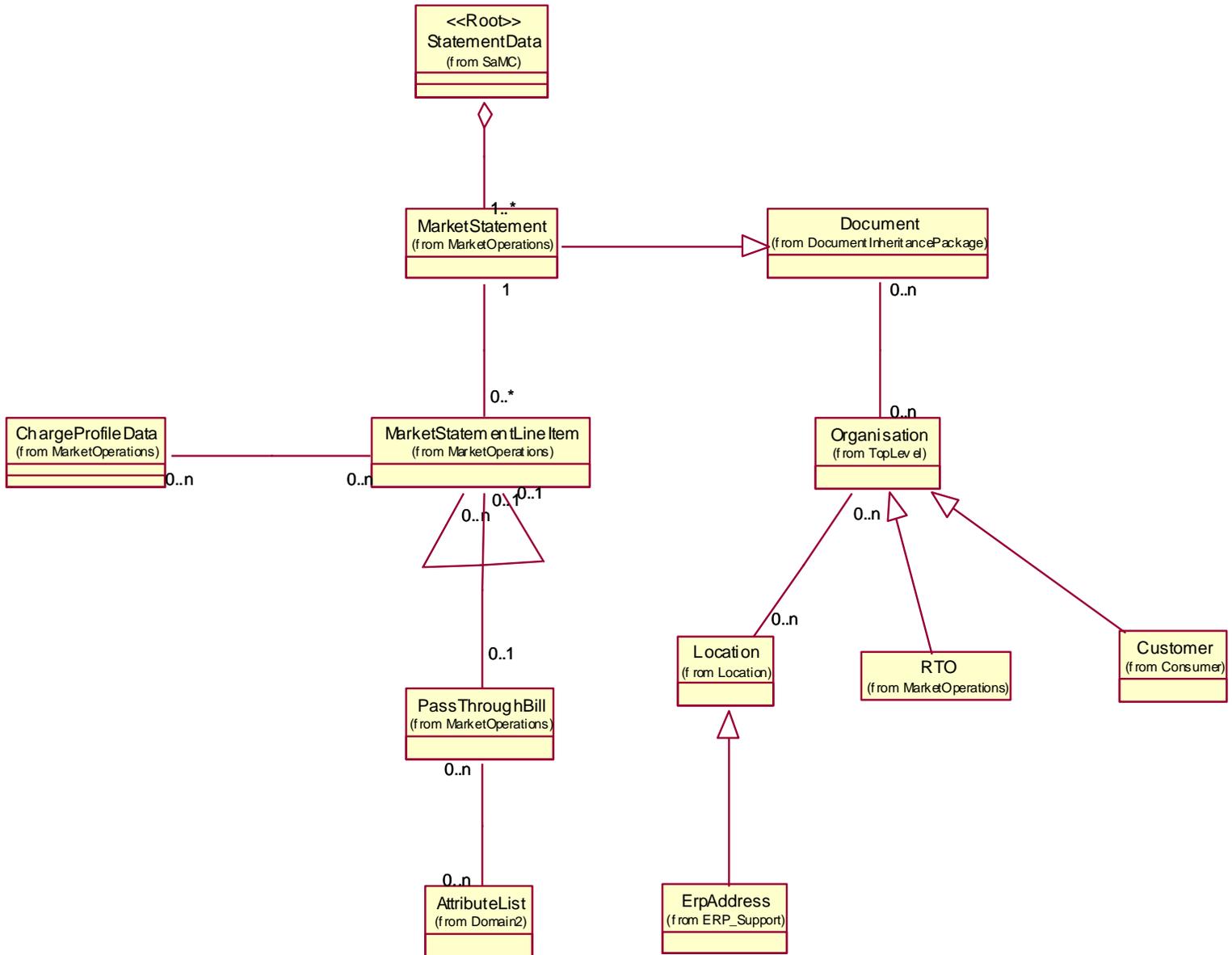
## 2.8 Message (Payload) Definitions

### 2.8.1 UML-BASED MESSAGE MODEL

Based on the statement data required for the SCs, a set of CIM classes and relationships has been identified to build the CIM based Statement Data message. Please see the following UML diagram. This UML diagram is the basis for generating the statement data message type (StatementData.xsd).

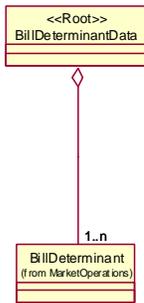
MDI Workbench Rational Rose Model is used to model CIM-based message UML diagrams shown as follows:

## UML for StatementData





**UML for BillDeterminantData**



**UML for Statement Data**

This model represents the Statement data in the logical format. It indicates that the StatementData could have one or more MarketStatement objects. It could also have one or more BillDeterminants. MarketStatement object is used to carry Statement header-related information. Each MarketStatement could have zero or many MarketStatementLineItem objects. MarketStatementLineItem could contain zero or more of itself. This means that each MarketStatementLineItem could represent both summary and detail information. Since MarketStatement inherits from Document, it could then have a relationship with Organization, which in this case, is inherited by Customer and BA. The AttributeList object is used for both BillDeterminant and MarketStatementLineItem to capture a list of configurable attribute name/value pair information to be included as part of the statement. The current value of each interval per Bill Determinant is represented in the ChargeProfileData class. PTB header information is to be associated with the MarketStatementLineItem at the Charge Code Interval Detail level.

**2.8.2 CIM/CME EXTENSION**

To meet the requirements of Statement Data message design, the following extensions are proposed:

- MarketStatement, MarketStatementLineItem, and BillDeterminant classed are added to the CIM/CME.

**2.8.3 ELEMENT TABLES**

The mapping between the StatementData.xsd and BillDeterminantData.xsd elements and the Statement XML sample data structure is summarized in the tables below. The table only shows the elements that are used in the statement files. Generic elements that are not used are not described. Where an element is only used on one level, it is only shown on that level.

Please Note: As stated above, there are elements in the xsd that are currently placeholders and not mapped to the payload file. Unmapped elements are not listed in the mapping tables. Only elements listed in the mapping table will be output as

required or optional data elements. Unmapped elements will eventually be removed from the xsd in a future delivery.

### 2.8.3.1 Statement Amount File

CIM based Statement Data	Note / Issues	Valid data / Enumeration
<b>Message Header</b>		
TimeDate	Date time XML file is written	2004-08-01T09:30:47-08:00
Source	Specific Name of SC XML file for MRI and SFTP, SCID-SETTLEMENT-RunNumber-SettlementType such as DAILY_INITIAL_MARKET-Version number such as 1-Status such as APPROVED:Trade date in existing form YYYYMMDD	SCID-SETTLEMENT-RunNumber-SettlementType-Version-Status-TradeDate  ABCD-SETTLEMENT-2012051711-DAILY_INITIAL_MARKET-1-APPROVED-20100801
<b>Message Payload</b>		
<b>MarketStatement (Header Record)</b>		
MarketStatement.aliasName	Settlement Batch Run Number	12334565
MarketStatement.description	Market or other statement type Major Group showing timing and type Initial , Recalculation, Rerun	TAC_RATE DAILY_INITIAL_CREDIT, DAILY_INITIAL_MARKET, HISTORIC_INITIAL_MARKET , HISTORIC_RECALC_MARKET, DAILY_RECALC_MARKET, DAILY_RERUN_MARKET MONTHLY_INITIAL_MARKET, MONTHLY_INITIAL_CREDIT , MONTHLY_RECALC_MARKET, MONTHLY_RERUN_MARKET , NERC_WECC_INITIAL, NERC_WECC_RECALC PEAK_INITIAL

CIM based Statement Data	Note / Issues	Valid data / Enumeration
		PEAK_RECALC TFR_INITIAL TFR_RECALC
MarketStatement.name	Settlement generated unique identifier of file	1226788989
MarketStatement.docType	Type of settlement statement such as credit estimate, initial, or recalculation	CREDIT, MARKET_INITIAL, MARKET_RECALC, MARKET_RERUN,
MarketStatement.lastModified	Previous Settlement version batch run date time. This time shows the last settlement run time regardless of whether this is a republication or a recalculation. BAs can use this date time to compare the Last Modified Date time on bill BA inputs, to determine what inputs have changed. In recalculations BAs can also use Net Amounts <> 0 to determine charges that have changed.	2004-08-01 T09:30:47-08:00
MarketStatement.comments	General comments by Statement Type	'Due next Market Invoice'
MarketStatement.docStatus	Generally "approved". If a trade date settlement run needs to be republished, it will simply be issued with a higher version number	APPROVED, CANCELLED
MarketStatement.revisionNumber	Incrementing published version number by trade date	1 or 2 and so on
MarketStatement.docTitle	Statement file name	SCID-SETTLEMENT-RUNNUMBER-SETTLEMENTTYPE-VERSION-STATUS-TRADEDATE
MarketStatement.tradeDate	This is the trade date being settled	2004-08-14 T00:00:00-14:0
MarketStatement.referenceNumber	Previous revision number from immediately prior invoiced settlement run where settlement run is a true up (recalc)  Previous statement number (name)	122880900

<b>CIM based Statement Data</b>	<b>Note / Issues</b>	<b>Valid data / Enumeration</b>
MarketStatement.subjectStatus		
MarketStatement.start	For reference. The bill period start date that the trade date falls within.	2004-08-01 T00:00:00-14:0
MarketStatement.end	For reference. The bill period that the trade date falls within.	2004-08-31 T00:00:00-08:0
MarketStatement.transactionDate	Published date and time (hour and minute)	200408010811
<b>Customer</b>		
Customer.aliasName	SCID name	EXCELLENT_ENERGY
Customer.name	Unique BAID number	9999
Customer.organizationCode	Identifies whether customer is being invoiced (BILL_TO) or is being paid (PAID_TO) for this trade date	BILL_TO PAY_TO SOLD_TO PROVIDED_BY
Customer.organizationType	Code to identify customer role, such as TO or BA	TO or BA or UDC
<b>Customer ErpAddress</b>		
Customer.ErpAddress.aliasName	The address type, in this case the Invoice mail to address.	MAIL_TO
Customer.ErpAddress.addressGeneral	Additional address information, for example a mail stop	"RMB"
Customer.ErpAddress.city	Name of city	"Folsom"
Customer.ErpAddress.stateOrProvince	Name of the state or province	"CA"
Customer.ErpAddress.country	Name of the country	"US"
Customer.ErpAddress.postalCode	Postal code for the address	95630

<b>CIM based Statement Data</b>	<b>Note / Issues</b>	<b>Valid data / Enumeration</b>
<b>Customer erpPerson (contact)</b>		
Customer.erpPerson.name	Full name that concatenates all person information	"Participant Contact Name"
Customer.erpPerson.ErpTelephoneNumber.localNumber	Customer phone number	999 666-8888
Customer.erpPerson.ErpTelephoneNumber.usage	Type of phone number	Cell, fax, pager
<b>RTO (California ISO)</b>		
RTO.aliasName	BAID name	CAISO
RTO.name	Unique BAID number	9999
RTO.organizationCode	Identifies whether RTO is being invoiced (BILL_TO) or is being paid (PAID_TO).	BILL_TO PAY_TO SOLD_TO PROVIDED_BY
RTO.organizationType	Code to identify RTO role	RTO
<b>RTOErpAddress</b>		
RTO.ErpAddress.aliasName	The address type, in this case ISO mail to address.	MAIL_TO
RTO.ErpAddress.addressGeneral	Additional address information, for example a mail stop	"RMB"
RTO.ErpAddress.city	Name of city	"Folsom"
RTO.ErpAddress.stateOrProvince	Name of the state or province	"CA"
RTO.ErpAddress.country	Name of the country	"US"

<b>CIM based Statement Data</b>	<b>Note / Issues</b>	<b>Valid data / Enumeration</b>
RTO.ErpAddress.postalCode	Postal code for the address	95630
<b>RTO erpPerson (Client Relations contact)</b>		
RTO.erpPerson.name	Full name that concatenates all person information	"Client Help"
RTO.erpPerson.ErpTelephoneNumber.localNumber	Client Relations phone number	916 351-0000
RTO.erpPerson.ErpTelephoneNumber.usage	Type of phone number	Home, cell, fax, etc
<b>MarketStatementLinItem (Trade Date Level)</b>		
MarketStatementLinItem.aliasName	Level name Valid codes are TRADE_DATE, PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE_SUMMARY, CHARGE_CODE_INTERVAL_TOTAL, CHARGE_CODE_INTERVAL_SUBTOTAL, CHARGE_CODE_INTERVAL_DETAIL  TRADE_DATE is the valid code for the first level	TRADE_DATE
MarketStatementLinItem.description	Actual Trade date in date form "YYYY_MM_DD"	2005_12_31
MarketStatementLinItem.name	Parent Charge Group, Charge Group or charge code identifier	111
MarketStatementLinItem.mrid	Unique identifier (used for parent child) within payload. Value creates a link to .ContainerMarketStatementLinItem.indexA	1,2, etc
MarketStatementLinItem.intervalDate	Ending interval Date Time. Note the last date time interval will be the next day 00:00:00.	2004-08-01T00:00:00-14:0
MarketStatementLinItem.previousAmount	Previous total amount for day for the level, in this case trade date as a whole	45599.90998

CIM based Statement Data	Note / Issues	Valid data / Enumeration
	Up to 5 decimals + for charge and – for payment	
MarketStatementLineltem.currentAmount	Current total amount for day for the level, in this case trade date as a whole  Up to 5 decimals + for charge and – for payment	233000.88909
MarketStatementLineltem.netAmount	Net total amount for day for the level (current value – previous value), in this case trade date as a whole  Up to 5 decimals + for charge and – for payment  Please note Prices and Quantities are not used at summary or subtotal levels and so are not output at this level	- 188999.12262
ContainerMarketStatementLineltem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Trade date or Charge Code to Charge Group  Trade date header points to itself.  Value creates a link to MarketStatementLineltem.MRID	1
<b>MarketStatementLineltem (Parent Charge Group, Charge Group, Charge Code Summary)</b>		
MarketStatementLineltem.aliasName	Level name Valid codes are TRADE_DATE, PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE_SUMMARY, CHARGE_CODE_INTERVAL_TOTAL, CHARGE_CODE_INTERVAL_SUBTOTAL, CHARGE_CODE_INTERVAL_DETAIL  PARENT_CHARGE_GROUP is the valid code for the Parent Charge Group level, CHARGE_GROUP is the valid code for the Charge Group level,	PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE_SUMMARY,
MarketStatementLineltem.description	Parent Charge Group name.  For Charge Group names see the Charge Group summary sheet.  Charge code summary records use the	MARKET, GMC, RMR, FERC, TAC, HIST_PT, FINANCIAL_ADJ  ANCILLARY_SERVICES  DA_SPINNING_RESERVE

CIM based Statement Data	Note / Issues	Valid data / Enumeration
	charge code name	_SETTLEMENT
MarketStatementLineItem.name	Parent Charge Group, Charge Group or charge code identifier	111
MarketStatementLineItem.mrid	Unique identifier (used for parent child) within payload	2, 3 etc
MarketStatementLineItem.previousAmount	Previous total amount for day for the level, in this case trade date as a whole  Up to 5 decimals  + for charge and – for payment	45599.90998
MarketStatementLineItem.currentAmount	Current total amount for day for the level, in this case trade date as a whole  Up to 5 decimals  + for charge and – for payment	233000.88909
MarketStatementLineItem.netAmount	Net total amount for day for the level (current value – previous value), in this case trade date as a whole  Up to 5 decimals  + for charge and – for payment  Please note Prices and Quantities are not used at summary or subtotal levels and so are not output at this level	- 188999.12262
ContainerMarketStatementLineItem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Trade date or Charge Code to Charge Group  Parent Charge Group point to trade date header MRID, Charge Groups to parent MRID and so forth	1
<b>MarketStatementLineItem (Charge Code Interval Total and Subtotal)</b>		
MarketStatementLineItem.aliasName	Level name Valid codes are TRADE_DATE, PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE_SUMMARY, CHARGE_CODE_INTERVAL_TOTAL, CHARGE_CODE_INTERVAL_SUBTOTAL, CHARGE_CODE_INTERVAL_DETAIL  CHARGE_CODE_INTERVAL_TOTAL is the	CHARGE_CODE_INTERVAL_TOTAL (includes amounts for PTB)  CHARGE_CODE_INTERVAL_SUBTOTAL (does not include amounts for PTB)

CIM based Statement Data	Note / Issues	Valid data / Enumeration
	valid code for the Interval total level for a charge code	
MarketStatementLineItem.description	Charge code name	DA_SPINNING_RESERVE_SETTLEMENT
MarketStatementLineItem.name	Charge code identifier	1
MarketStatementLineItem.mrid	Unique identifier (used for parent child) within payload	8,9 etc
MarketStatementLineItem.uom	Unit of measure for charge quantity, such as MW, MWH, UNIT	UNIT, MW, MWH
MarketStatementLineItem.intervalCount	Maximum number of possible intervals. Will be 1 for daily, 25 for hourly, 100 for 15 minute, 150 for 10 minute or 300 for 5-minute intervals. 1 for trade date, Parent Charge Group and Charge Group and charge code summary as these are daily sub totals.	1
ContainerMarketStatementLineItem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Trade date or Charge Code to Charge Group  Charge code Interval Total points to Charge Code Summary MRID	1

**MarketStatementLineItem (Charge Code Interval Detail)**

MarketStatementLineItem.aliasName	<p>Level name Valid codes are TRADE_DATE, PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE_SUMMARY, CHARGE_CODE_INTERVAL_TOTAL, CHARGE_CODE_INTERVAL_SUBTOTAL, CHARGE_CODE_INTERVAL_DETAIL</p> <p>CHARGE_CODE_INTERVAL_DETAIL is the valid code for the Interval Detail level for a charge code.</p> <p>There will be one record for each specific charge calculation in the interval for a BAID, for example where a charge is by zone and the BAID has charges in two zones there will be separate Interval Detail records. The differentiation between interval details is given</p>	CHARGE_CODE_INTERVAL_DETAIL
-----------------------------------	---	-----------------------------

<b>CIM based Statement Data</b>	<b>Note / Issues</b>	<b>Valid data / Enumeration</b>
	by the attached attribute list.	
MarketStatementLineItem.description	Charge code name	DA_SPINNING_RESERVE_SETTLEMENT
MarketStatementLineItem.name	Charge code identifier	1
MarketStatementLineItem.mrid	Unique identifier (used for parent child) within payload	10,11 etc
MarketStatementLineItem.uom	Unit of measure for charge quantity, such as MW, MWH, UNIT	UNIT, MW, MWH
MarketStatementLineItem.intervalCount	Maximum number of possible intervals. Will be 1 for daily, 25 for hourly, 100 for 15 minute, 150 for 10 minute or 300 for 5-minute intervals. 1 for trade date, Parent Charge Group and Charge Group and charge code summary as these are daily sub totals.	1
ContainerMarketStatementLineItem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Trade date or Charge Code to Charge Group  Charge code interval detail will point to Charge Code Interval summary MRID	1

**Attribute List (Only apply to Charge Code Interval Detail, and written just in first interval to minimize repeats – see example)**

Attribute.seq	Sequence of a configurable attribute used to differentiate the charge code interval detail records. Sequence is not meaningful.	1 to 30
Attribute.name	Specific details of charge at the detail interval level only. These will be a unique combination of attributes for each interval detail set for a charge code for a day.  Total of up 30 attributes are possible. These are self defining The name of a configurable attribute such as LOCATION or ZONE  See Business Practice Manual for complete list	LOCATION REGION OR ZONE ENERGY_ TYPE and so on
Attribute.val	The actual value of a configurable attribute, such as actual location or dispute id	NP15

**ChargeProfileData (Applies to Charge Code Interval Total, Charge Code**

CIM based Statement Data	Note / Issues	Valid data / Enumeration
<b>Interval Subtotal, and Charge Code Interval Detail, and written just in first interval to minimize repeats – see example)</b>		
ChargeProfileData.component	Data Description UOM	Interval Total: Subtotal: SUBTOT_CURRENT_AMOUNT, SUBTOT_PREVIOUS_AMOUNT, SUBTOT_NET_AMOUNT Interval Subtotal: SUB_SUBTOT_CURRENT_AMOUNTSUB_SUBTOT_PREVIOUS_AMOUNT, SUB_SUBTOT_NET_AMOUNT Interval Detail: CURRENT_AMOUNT, CURRENT_PRICE, CURRENT_QUANTITY, PREVIOUS_AMOUNT, PREVIOUS_PRICE, PREVIOUS_QUANTITY, NET_AMOUNT, NET_PRICE, NET_QUANTITY
ChargeProfileData.data.int	UTC date/time to identify intervals	2004-08-01 T09:30:00-08:00
ChargeProfileData.value	Value	55

### 2.8.3.2 BillDeterminant File

CIM based Statement Data	Note / Issues	Valid data / Enumeration
<b>Message Header</b>		
TimeDate	Date time XML file is written	2004-08-01T09:30:47-08:00
Source	Format <i>SCID-DETERMINANTS-RunNumber-SettlementType-Version-Status-TradeDate-</i> . i.e. "	ABCD-DETERMINANTS-2012041112-DAILY_INITIAL_MARKET -1-APPROVED-

CIM based Statement Data	Note / Issues	Valid data / Enumeration
		20050326.xml"
<b>Message Payload</b>		
<b>Bill Determinant Header</b>		
BillDeterminant.name	Name of Bill Determinant, based on data dictionary and naming convention	DA_HOUR_SPIN_CAP@QUANTITY
BillDeterminant.mrid	System Generated Unique Sequential Identifier	1,2,3,...99999
BillDeterminant.dataType	PRIMARY (direct input) or INTERMEDIATE (calculated) or OUTPUT (reported value only)	PRIMARY, INTERMEDIATE, OUTPUT
Bill Determinant.last Modified	Date time record was last changed. Compare with previous run last modified date to see inputs that have changed since the last run	2004-08-01 T09:30:47-08:00
BillDeterminant.settlementVer	Version of input data where relevant	1
BillDeterminant.dataSource	Source of data such as Direct entry, pass thru bill or meter	PTB, METER
BillDeterminant.uom	Unit of measure for Bill Determinant, e.g. MW	MW, MWH, \$, UNIT, FACTOR
BillDeterminant.calcLevel	Level in charge calculation order (intermediate Bill Determinants and outputs only)	3
BillDeterminant.precisionLevel	Precision is number of Decimals of values. 0 to 9	5
BillDeterminant.configVer	Version of configuration used to calculate (calculated and output values only)	3
BillDeterminant.intervalCount	Maximum number of possible intervals. Will be 1 for daily, 25 for hourly, 100 for 15 minute, 150 for 10 minute or 300 for 5-minute intervals. 1 for trade date, Parent Charge Group and Charge Group and charge code summary as these are daily sub totals.	150
BillDeterminant.C Code	Cross reference field linking a particular bill determinant data item to Charge Code name from the Settlement Statement file. This is not a	1234

<b>CIM based Statement Data</b>	<b>Note / Issues</b>	<b>Valid data / Enumeration</b>
	<p>one-to-one relation. More than one value is expected in the underlying attribute ref values.</p> <p>Value creates multiple links to MarketStatementLineItem.name</p>	
BillDeterminant.indexA	<p>Cross reference field linking child to parent for example name to Charge Code in the Statement file or name to name in the Bill Determinant file itself. May contain more than one attribute value.</p> <p>Value creates a link to MarketStatementLineItem.MRID or BillDeterminant.MRID</p>	1
BillDeterminant.PT BComments	This is a comment field for any Pass-Through-Bill adjustments. Maximum number of character is 150.	150
<b>Bill Determinant Data</b>		
BillDeterminant.Data.int	UTC date/time to identify intervals	2004-08-01 T09:30:00-08:00
BillDeterminant.Data.val	Current value. Could be price, qty, amount, % etc. Defined in unit of measure above for the Bill Determinant	9999
<b>Attribute List (Bill Determinant)</b>		
BillDeterminant.Attribute.seq	Sequence of a configurable attribute used to differentiate the Bill Determinant records. Sequence is not meaningful.	1 to 30
BillDeterminant.Attribute.name	<p>Specific details of BD Total of up 30 attributes are possible. These are self defining The name of a configurable attribute such as LOCATION or ZONE</p> <p>See Business Practice Manual for complete list</p>	LOCATION REGION OR ZONE ENERGY_ TYPE and so on
BillDeterminant.Attribute.val	The actual value of a configurable attribute, such as actual location or dispute id	NP15

## 2.8.4 STATEMENTDATA SCHEMA

Please reference XSD file that is available on CAISO website as indicated in Section 1.3.



## **2.8.5 BILLDETERMINANTDATA SCHEMA**

Reference XSD file that is available on CAISO website as indicated in Section 1.3.

## **2.8.6 STATEMENTDATA.XSD AND BILLDETERMINANTDATA.XSD**

Current versions of both files are available on CAISO website as indicated in Section 1.3.

## 3 Invoice XML Payload

### 3.1 Description

The Invoice (or Payment Advice) is a document published as a result of an Invoicing Run in which a SC's current net financial obligation is a positive amount (negative amount in the case of a Payment Advice). For MRTU, there will be a single net Invoice/Payment Advice, which will include Market related charges or payments, as well as FERC Fees, GMC amounts and Access Charges. Please refer to the Billing and Invoice Process section of the Business Practice Manual for Settlements & Billing, for a description of the various Invoice types and what is included in each.

This single Invoice/Payment will cover the Trading Month or Bill Period as indicated by the CAISO Payment Calendar, and potentially any prior Bill Periods resettled during the calendar month. These will be separately itemized by Bill Period.

### 3.2 Purpose

The Invoice/Payment Advice is the key financial document used to settle the market. The Invoice/Payment Advice communicates how much a SC is owed or is obligated to pay.

### 3.3 Frequency

Invoices/Payment Advices are produced weekly in accordance with the CAISO Payment Calendar, and as mentioned previously, the net amount can reflect a total covering multiple Bill Periods.

### 3.4 Communication Network

The files will be available to download over the Internet by utilizing the CAISO Portal.

### 3.5 Communication Protocol

The communication protocol for manually downloading files from the CAISO Portal will be HTTPS.

In addition to manual downloads, the CAISO will support an automated API. The initial release release of MRTU will support SFTP.

### 3.6 File Names

#### 3.6.1 INVOICE AND PAYMENT ADVICES -

**Market Result Interface - Settlements (MRI) and Secure File Transfer Protocol (SFTP)**

Format is –

Zipped File:

*SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-PostingDate and timestamp.* i.e.

“ABCD-INVOICE-2005032611-MARKET-1-APPROVED-20050326-200504030915.xml.zip”

Individual Unzipped File:

*SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD-INVOICE-2005032611-MARKET-1-APPROVED-20050326-200504020916.xml”

RMR Invoice:

Format is *SCID-INVOICE-RunNumber-InvoiceType-Facility-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD-INVOICE-2005032612-RMR-Potero-1-APPROVED-20050326-200504020916.xml”

NERC\_WECC\_INVOICE

Format is *SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD- INVOICE-2011053131-NERC\_WECC-6-APPROVED-20110801-200504020916.xml”

SHORTFALL Invoice:

Format is *SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD-INVOICE-2005032611-SHORTFALL-1-APPROVED-20050326-200504020916.xml”

Peak Invoice:

Format is *SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD-INVOICE-2015011053-PEAK-1-APPROVED-20140101-201511051616.xml”

Transferred Frequency Response Invoice:

Format is *SCID-INVOICE-RunNumber-InvoiceType-Version-Status-TradeDate-GeneratedDateandtimestamp.* i.e.

“ABCD-INVOICE-2017011054-TFR-1-APPROVED-20150101-201711061623.xml”

### 3.7 Error Handling

In the event Invoices/Payment Advices are incorrect for the Market Invoice type, all Invoices/Payment can be cancelled using a complete reversal and generation of new Invoices/Payment Advices can be issued as rebills. Please refer to the Cancel Rebill section of the Business Practice Manual for Settlements & Billing, for a description of the process. Once the errors are corrected and new Invoices/Payment Advices generated, the data exchange will go through the same process. Note also that bankruptcy transactions can appear on separate Invoices/Payment Advices. Please refer to the Business Associate Bankruptcy section of the Business Practice Manual for Settlements & Billing for details.

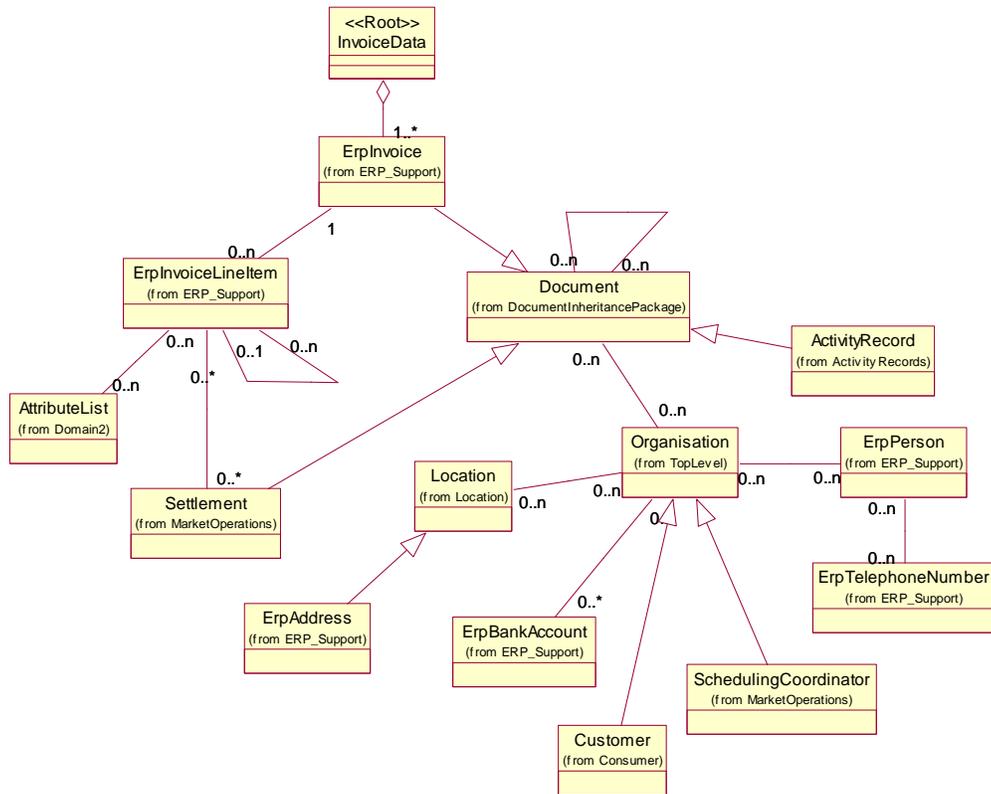
In the event Invoices/Payment Advices are incorrect for the RMR Invoice type, individual Invoices can be manually reversed and reissued as new invoices. This is also detailed in the BPM for Settlements & Billing

### 3.8 Message Payload Definitions

#### 3.8.1 UML BASED MESSAGE MODEL

Based on the invoice data required for the Financial Clearing system and BAs, a set of CIM classes and relationships has been identified to build the CIM based invoice data message. Please see the following UML diagram. This UML diagram is used as the basis for generating the invoice and general ledger data message type (InvoiceData.xsd and GeneralLedgerData.xsd).

MDI Workbench Rational Rose Model is used to model CIM California ISO extension, and CIM based message UML diagrams shown as follows:



### Invoice UML model

This model represents the Invoice Data in the logical format. It indicates that the InvoiceData could have one or more ErpInvoice objects. ErpInvoice object is used to carry Invoice header-related information. Each ErpInvoice could have zero or many ErpInvoiceLineItem objects. ErpInvoiceLineItem could contain zero or more of itself. This means that each ErpInvoiceLineItem could represent both summary and detail information. ErpInvoiceLineItem could be related to Settlement (which represents Settlement Runs) where necessary. Since ErpInvoice inherits from Document, it could then have a relationship with Organization, which in this case, is inherited by Customer and Scheduling Coordinator. Two of the Organization type of class will then have relationship with ErpInvoice, ErpPerson, ErpBankAccount, and ErpAddress (through Location). The AttributeList object is used for transaction reference information.

### 3.8.2 CIM/CME EXTENSION

To meet the requirements of Invoice Data message design, the following extensions are proposed:

- New classes added are: Scheduling Coordinator, ErpBankAccount, ErpLedger, ErpLedgerEntry, Settlement, and AttributeList

- The AttributeList class is added to support generic attribute name/value pair. The use of this class should be limited to situations where data elements exchanged vary based upon application configuration and where the consumer of that information will take them as is.

As part of the California ISO Common Semantic Model management process, all extensions are initially added to the California ISO extension portion of the model. However, many of these extensions are expected to go into CIM. In fact, all extensions to CIM/CME to date haven been proposed to be part of the future CIM.

### 3.8.3 ELEMENT TABLES

The mapping between the InvoiceData.xsd elements and the Invoice XML sample data structure is summarized in the table below.

Please Note: There are elements in the xsd that are currently placeholders and not mapped to the payload file. Unmapped elements are not listed in the mapping tables. Only elements listed in the mapping table will be output as required or optional data elements. Unmapped elements will eventually be removed from the xsd in a future delivery.

CIM based Invoice Data	Description & Notes	Valid values / Enumeration
<b>Message Header</b>		
TimeDate	Date time XML file is written	2004-08-01T09:30:47-08:00
Source	Specific Name of BA XML file for SCID-INVOICE-RunNumber such as 2012091232-Invoice Type such as MARKET-Version number such as 1-Status such as APPROVED:Bill period end date in existing form YYYYMMDD	SCID-INVOICE-RunNumber-MARKET-1-APPROVED-YYYYMMDD
<b>Message Payload</b>		
<b>erplInvoice (Header Record)</b>		
aliasName	Invoice batch run number	100089
description	Flag to indicate if overall net invoice is Due ISO ( in which case it is an invoice) or Due BA (in which case it is a payment advice. This is determined based on total net amount	INVOICE or PAYMENT_ADVICE
name	Settlement system generated unique Invoice document identifier	1000009

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
docType	Invoice type such as Market, RMR, SHORTFALL and Annual FERC	MARKET or RMR or ANNUAL_FERC SHORTFALL NERC_WECC PEAK TFR
lastModified	Date time invoice was created in the settlement system	2004-08-01T09:30:47-08:00
invoiceComments	Specific invoice message relevant to BA	This fixes your disputes
participantComments	Specific invoice message from BA	Please make Adjustment
docStatus	Invoice status such as Approved or Cancelled. PLEASE NOTE a cancelled invoice has the same number as the original invoice but is a complete reversal. The replacement reversal invoice will have a new number.	APPROVED, CANCELLED
revisionNumber	Version on invoice, normally 1	1
subjectStatus	Optional for specifying payment status such as held in escrow, pending bankruptcy, etc.. PAYMENT_ADVICE with this code will not be paid..  Please note in the case of shortfall only the PTB adjustment lines are processed.	BANKRUPTCY_HOLD ESCROW_HOLD SHORTFALL_HOLD SHORTFALL_RELEASE
dueDate	Financial Clearing due date. PLEASE NOTE THIS shows the actual time due as well as the due date	2004-08-01T09:30:47-08:00
invoiceAmount	Total net amount. Where the Net Amount is due ISO (+) the document is flagged as an INVOICE and must be paid by the due date time. Where the net amount is Due BA (-) it is flagged as a PAYMENT_ADVICE	-100.00
transferType	Form of funds transfer, Wire or ACH	ACH or WIRE or CHECK
transactionDate	Invoice as of date typically the last settlement day of the month / bill period.	2004-08-31T00:00:00-14:0

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
referenceNumber	<p>Non unique Invoice number used by RMR which is site specific, In the case of a Market invoice it is the same as the invoice name below. Number will be repeated for a CANCEL invoice transaction.</p> <p>This is used in Financial Clearing to create AR and AP ledger entries</p>	SITE_100220 or for Market 1000009
<b>ActivityRecord</b>		
ActivityRecord.remarks	General invoice comments This will be a system generated standard message	"Please pay by 10 Am on the due date"
<b>Customer</b>		
Customer.aliasName	BAID name	EXCELLENT_ENERGY
Customer.name	Unique BAID number	9999
Customer.organizationCode	<p>Identifies whether customer is being invoiced (BILL_TO) or is being paid (PAID_TO).</p> <p>In Stage 1, SOLD_TO and PROVIDED_BY is not used</p>	BILL_TO PAY_TO SOLD_TO PROVIDED_BY
Customer.organizationType	Code to identify customer role, such as TO or BA	TO or BA or UDC
<b>CustomerErpAddress</b>		
Customer.ErpAddress.aliasName	The address type, in this case the Invoice mail to address. The RMR site being billed is indicated in the invoice reference above and the location code below	MAIL_TO
Customer.ErpAddress.addressGeneral	Additional address information, for example a mail stop	"RMB"
Customer.ErpAddress.city	Name of city	"Folsom"
Customer.ErpAddress.stateOrProvince	Name of the state or province	"CA"
Customer.ErpAddress.country	Name of the country	"US"
Customer.ErpAddress.postalCode	Postal code for the address	95630

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
<b>Customer ErpBankAccount</b>		
customer.ErpBankAccount.aliasName	Bank name. Bank account is specific to RMR site.	"Bank of America"
customer.ErpBankAccount.description	Bank Account Name	"BA Trading Inc"
customer.ErpBankAccount.name	Bank identifier	88879990
customer.ErpBankAccount.pathName	Bank Branch Name	"Folsom"
customer.ErpBankAccount.bankABA	Bank ABA identifier	112040
<b>Customer erpPerson (contact)</b>		
Customer.erpPerson.name	Full name that concatenates all person information	"Participant Contact Name"
Customer.erpPerson.ErpTelephoneNumber.usage	Type of phone number	Cell, fax, pager
Customer.erpPerson.ErpTelephoneNumber.localNumber	Customer phone number for invoice type..Local Phone number	666-8888
<b>RTO (California ISO)</b>		
RTO.aliasName	BAID name	CAISO
RTO.name	Unique BAID number	9999
RTO.organizationCode	Identifies whether RTO is being invoiced (BILL_TO) or is being paid (PAID_TO). In Stage 1, SOLD_TO and PROVIDED_BY is not used	BILL_TO PAY_TO SOLD_TO PROVIDED_BY
RTO.organizationType	Code to identify RTO role	RTO

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
<b>RTOErpAddress</b>		
RTO.ErpAddress.aliasName	The address type, in this case ISO mail to address.	MAIL_TO
RTO.ErpAddress.addressGeneral	Additional address information, for example a mail stop	"RMB"
RTO.ErpAddress.city	Name of city	"Folsom"
RTO.ErpAddress.stateOrProvince	Name of the state or province	"CA"
RTO.ErpAddress.country	Name of the country	"US"
RTO.ErpAddress.postalCode	Postal code for the address	95630
<b>RTO ErpBankAccount</b>		
RTO.ErpBankAccount.aliasName	California ISO Bank name / Account name	"Bank of America"
RTO.ErpBankAccount.description	Bank Account Name	"RTO Market Account"
RTO.ErpBankAccount.name	California ISO Bank identifier for invoice type	88879990
RTO.ErpBankAccount.pathName	Bank Branch Name	"Folsom"
RTO.ErpBankAccount.bankABA	California ISO Bank ABA identifier for invoice type	112040
<b>RTO erpPerson (Client Relations contact)</b>		
RTO.erpPerson.name	Full name that concatenates all person information	"Client Help"
RTO.erpPerson.ErpTelephoneNumber.usage	Type of phone number	Cell, fax, pager
RTO.erpPerson.ErpTelephoneNumber.localNumber	Client Relations phone number for invoice type..Local Phone number	351-0000

CIM based Invoice Data	Description & Notes	Valid values / Enumeration
<b>ErpInvoiceLineItem (Bill Period)</b>		
ErpInvoiceLineItem.aliasName	Line item level identifier. Valid codes are BILL_PERIOD (this level), PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE, PTB_ITEM  Please note there will be multiple bill periods on the invoice sorted from most current to oldest	BILL_PERIOD
ErpInvoiceLineItem.description	Bill period start and end description	"YYYY-MM-DD to YYYY-MM-DD"
ErpInvoiceLineItem.mrid	Unique identifier (used for parent child) within payload	1,2, etc
ErpInvoice.LineItem.lineAmount	Summary total for bill period of current amount, representing the invoiced to date amount for the item	233000.00
ErpInvoiceLineItem.lineType	Bill type, initial or recalculation for the bill period. Normally there will be only one initial bill period per invoice, and multiple recalculation bill periods.	INITIAL, RECALC, HISTORIC_INITIAL, HISTORIC_RECALC
ErpInvoiceLineItem.start	Bill period start date	2004-08-01T00:00:00-14:0
ErpInvoiceLineItem.end	Bill period end date	2004-08-31T00:00:00-14:0
ErpInvoiceLineItem.lineVersion	Version of billing for that bill period, incrementing number from one	1
ErpInvoiceLineItem.previousAmount	Summary total for bill period of previous amount	133000.00
ErpInvoice.LineItem.netAmount	Summary total for bill period of net amount, the amount to be paid / received this invoice period for the respective bill period	100000.00
ErpInvoice.LineItemSettlement.aliasName	Settlement Batch Run Number	12334565
ErpInvoice.LineItemSettlement.docTitle	Specific Name of BA Settlement Amount file, SCID-SETTLEMENT-Settlement Type such as MARKET-Version number such as 1-Status such as APPROVED:Trade date in existing form	SCID-SETTLEMENT-MARKET_INITIAL-1-YYYYMMDD

CIM based Invoice Data	Description & Notes	Valid values / Enumeration
	YYYYMMDD	SCID-SETTLEMENT-MARKET_RECALC-1-YYYYMMDD  SCID-SETTLEMENT-MARKET_RERUN-1-YYYYMMDD  SCID-SETTLEMENT-SHORFALL_INV-1-YYYYMMDD  SCID-SETTLEMENT-NERC_WECC_INITIAL-1-YYYYMMDD
ErpInvoice.LineItem Settlement.tradeDate	Cross-reference to settlement runs by trade day invoiced for the bill period. This only occurs with bill period line items.  There will be record for each settlement trade day invoiced in the bill period.	2004-08-01T00:00:00-14:0
ContainerErpInvoiceLineItem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Bill Period or Charge Code to Charge Group  Bill period header points to itself.	1
<b>erpInvoiceLineItem (Parent Charge Group, Charge Group, Charge Code)</b>		
ErpInvoiceLineItem.alias Name	Line item level identifier. Valid codes are BILL_PERIOD (this level), PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE, PTB_ITEM  Please see the separate Charge Group codes for the Parent Charge Group, Charge Group and charge code hierarchy.	PARENT_CHARGE_GROUP, CHARGE_GROUP, CHARGE_CODE
ErpInvoiceLineItem.desc	Charge Group or Charge Code Name	MARKET or ANCILLARY_SERVICE or

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
ErpInvoiceLinItem.description		DA_SPIN_RESERVE_SETTLEMENT
ErpInvoiceLinItem.name	Charge Number or PTB Number.	111
ErpInvoiceLinItem.mrid	Unique identifier (used for parent child) within payload	2, 3 etc
ErpInvoiceLinItem.lineAmount	Summary total for level of current amount. To date total billed for charge code for bill period.	233000.00
ErpInvoiceLinItem.previousAmount	Summary total for level of previous amount billed for charge code.	233000.00
ErpInvoiceLinItem.netAmount	Summary total for level of net amount due or payable for bill period at charge code level	233000.00
ErpInvoiceLinItem.accountGL	Valid GL code will be added to each invoice line item as the Financial Clearing system does a blind check of invoice line GL totals versus the total received via the GL interface. BAs can ignore this element, which is used when Financial Clearing imports this record.	9999.ANCILLARY_SERVICE.111
ErpInvoiceLinItem.costCenter	BAID number	9999
ErpInvoiceLinItem.majorAccount	Charge group name	ANCILLARY_SERVICE
ErpInvoiceLinItem.minorAccount	Charge code number	111
ContainerErpInvoiceLinItem.indexA	Cross reference field linking child to parent for example Parent Charge Group to Bill Period or Charge Code to Charge Group	1
<b>erpInvoiceLinItem (PTB Financial Adjustment)</b>		
ErpInvoiceLinItem.aliasName	Line item level identifier. Valid codes at this level is PTB_ITEM  Please note PTB items are only included for invoice related adjustments such as interest, shortfalls, and fund releases. A charge code may have multiple PTB entries, for example as interest is separately charged for each outstanding invoice.	PTB_ITEM

<b>CIM based Invoice Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
ErpInvoiceLineItem.description	PTB charge code name	PTB_FIN_ADJ_INTEREST_CHARGED, PTB_FIN_ADJ_SHORTFALL_HOLD, PTB_FIN_ADJ_SHORTFALL_RELEASE, PTB_FIN_ADJ_INTEREST_PAID
ErpInvoiceLineItem.name	PTB transaction Number.	111
ErpInvoiceLineItem.mrid	Unique identifier (used for parent child) within payload	8, 9 etc
ErpInvoice.LineItem.line Amount	PTB adjustment amount	500.00
ErpInvoice.LineItem.netAmount	PTB adjustment amount	500.00
ContainerErpInvoiceLineItem.indexA	Cross reference field linking PTB_ITEM to Charge Code	5
AttributeList.Sequence	Sequence of a configurable attribute. This is not meaningful	1, 2, etc
AttributeList.Name	The name of a configurable attribute such as PTB ID and Invoice reference associated with the PTB transaction.	PTB_ID, INVOICE_REFERENCE, PREVIOUS_BILL_PERIOD_START, PREVIOUS_BILL_PERIOD_END, DISPUTE_ID
AttributeList.Value	The actual value of a configurable attribute, such as prior invoice number being adjusted.	1122220 or 2004-04-01T00:00:00-14:0

### 3.8.4 INVOICEDATA SCHEMA

Reference XSD file that is available on CAISO website as indicated in Section 1.3.

### 3.8.5 INVOICEDATA.XSD

Current version of file is posted on CAISO website as indicated in Section 1.3.



## 4 Configuration Output XML Payload

### 4.1 Description

This section describes the Settlement Configuration output, provided by California ISO to allow SCs to review, use and if required load the actual settlement equations and definitions used by California ISO in calculating settlement charges. Business Practice Manual documents also provide a written explanation of the equations used by California ISO. It is important to state here that the Business Practice Manual documents present formulas as requirements, whereas the configuration output formulas will show formulas as they have actually been implemented in the new Settlements system.

The configuration output provides details of both the actual Bill Determinants and associated formulas used by California ISO's settlement system to calculate charges. A Bill Determinant's relevance to a calculation is also provided. The output details the following:

- Specific Bill Determinants and their valid attributes as used in defined settlement calculations. This includes raw data as provided from other California ISO systems, intermediate calculation results, final billable quantities, billable prices, and billable amounts for both BA-specific and California ISO-wide totals.
- Charge equations with their Bill Determinant inputs, calculation order, formulas, intermediate results and outputs.
- Other relevant standing data such as the defined charge codes, groups and Parent Charge Groups.
- Change history using effective dates directly against each Bill Determinant.

### 4.2 Purpose

The purpose of this output is to provide SCs with a version of the settlement equations that they can load into their own systems and so that they can review the Bill Determinants provided in the statements and know in which calculations these Bill Determinants are used.

### 4.3 Frequency

It is expected that this output will be updated each time calculation rules change. The complete XML file is produced whenever there is a change to any calculation or Bill Determinant, though it is an operator decision as to when all changes for that particular release have been made.

### 4.4 Communication Network

The files will be available to download over the Internet by utilizing the CAISO Portal.

### 4.5 Communication Protocol

The communication protocol for manually downloading files from the CAISO Portal will be HTTPS.



In addition to manual downloads, the CAISO will support an automated API. The initial release of MRTU will support SFTP. Alternate technologies will be planned for future releases (post MRTU release 1).

## 4.6 File Names

### 4.6.1 CONFIGURATION OUTPUT FILE -

Format is: CONFIGURATION\_OUTPUT-Version-STATUS-Generation Date

Example: CONFIGURATION\_OUTPUT-40-APPROVED-2005-05-23T13.55.25-07.00.xml

## 4.7 Error Handling

Data will be republished in the event of an error.

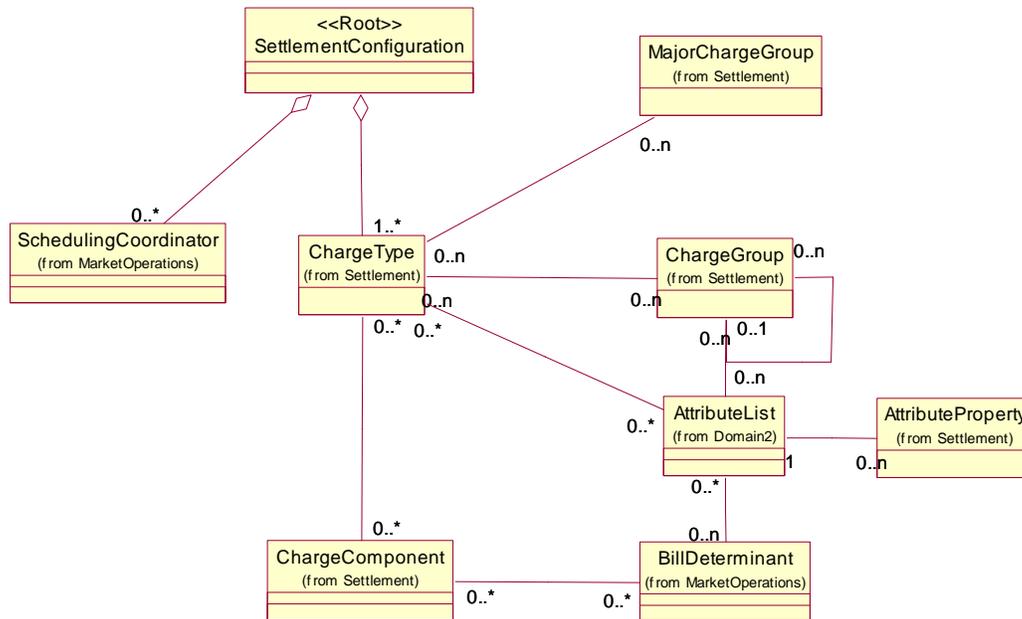
## 4.8 Message Payload Definitions

### 4.8.1 UML BASED MESSAGE MODEL

Based on the Configuration File required for the Market Participants, a set of CIM classes and relationships have been identified to build the CIM-based Configuration File message, see the following UML diagram. This UML diagram is then used as the basis for generating the configuration message type (SettlementConfiguration.xsd).

MDI Workbench Rational Rose Model is used to model CIM based message UML diagrams shown as follows.

#### **UML For Settlement Configuration file**



This model represents the Settlement Configuration Output File in the logical format. It indicates that the configuration Output File consists of the following classes:

- SchedulingCoordinator, where there are SC-specific configuration rules, typically exceptions or charges that only apply to a specific type of SC.
- MajorChargeGroup, which are the groupings of charges used to schedule settlement runs. Daily market is one such group as opposed to Monthly Market charges or RMR charges.
- ChargeType are the specific charge calculations. These may either be intermediate calculations of prices or quantities or actual charge calculations called “charge codes”.
- ChargeGroup in the first level grouping of charge codes, which are normally expected to balance or be neutral, such as Ancillary Services, UDP or No Pay. A Charge Group hierarchy is supported where Parent Charge Groups may be defined, such as Market, GMC and FERC fees.
- ChargeComponent is the specific calculation performed by a charge type for a specific unit of measure. For example a charge code could have one equation to calculate price, another to calculate quantity and a third amount component that takes to quantity and price results to calculate an amount.

- BillDeterminant are the actual settlement inputs used in charge type component calculations. Where the result of a calculation is used in a subsequent calculation, that result is also a Bill Determinant.
- AttributeList is the specific attributes such as BA ID, Location ID, Interchange ID, Zone ID and so on that are associated with a particular Bill Determinant and which are in turn used in calculations, for example **zonal** prices x **zonal** metered demand.

The relationship included in the model can be summarized as follows:

- AttributeList exists under ChargeType, ChargeGroup and BillDeterminant. A Charge Group has a defined set of attributes such as BA ID, location, zone. All charge codes and calculations within a Charge Group must use all or a subset of the attributes of the Charge Group to which they belong. Bill determinants (inputs and results) also have attributes. These must be consistent with the charge code's attributes in which they are used, though a particular charge code may only use a subset of all attributes available to BAs.
- ChargeType contains one and only one charge ChargeGroup, multiple MajorChargeGroups (for example daily and monthly initial and recalculation runs), one or more ChargeComponent such as quantity price and amount, and AttributeList.
- ChargeComponent contains one or many BillDeterminants as inputs.
- ChargeGroup can be at both MessagePayload and MessagePayload/ChargeType levels. The one under MessagePayload lists detail information on a ChargeGroup. The one under ChargeType contains only a ChargeGroup name that refers to the one at MessagePayload level.
- MajorChargeGroup can be at both MessagePayload and MessagePayload/ChargeType levels just like ChargeGroup.
- No relationship exists between ChargeGroup and MajorChargeGroup.
- ChargeGroup can have multiple instances with hierarchy relationships defined using MRID and indexA and constrained using Key and KeyRef.
- BillDeterminant can be at both MessagePayload and MessagePayload / ChargeType / ChargeComponent levels. The one under MessagePayload lists all BillDeterminants. The one under ChargeType / ChargeComponent is used to indicate a relationship between ChargeComponent and BillDeterminant. A BillDeterminant can be used in many ChargeComponents and a ChargeComponents records the BillDeterminant name of the ChargeComponent.

It should also be noted that the output is selective. The XML only includes:

- Actual charge codes and their children calculations and Bill Determinants, including relevant precalculations.
- Reportable Bill Determinants

The XML file specifically excludes:

- Summary calculations
- Pass Thru Bill charge type adjustment calculations
- Validation and other error checking or reporting logic used internally.
- Billing and Invoicing Logic

Also note that to relate an individual ChargeGroup with its parent level ChargeGroup, one needs to use the IndexA attribute of ChargeGroupParent.ChargeGroupChild element to match the MRID attribute of a ChargeGroup. As a key, the MRID attribute should be unique within the XML document.

#### **4.8.2 CIM/CME EXTENSION**

To meet the requirements of Configuration Output File message design, the following extension classes are proposed:

- MajorChargeGroup
- ChargeGroup
- ChargeType
- ChargeComponent
- AttributeProperty – used to add properties for a particular attribute, such as a summation flag or exception flag

Also, new attributes are added into the BillDeterminant class as listed below:

- EffectiveDate
- Exception
- Factor
- Frequency
- DeleteStatus
- Offset
- PrimaryYN
- ReferenceFlag
- Reportable
- RoundOff
- Source
- TerminationDate

#### **4.8.3 ELEMENT TABLES**

The mapping between the CIM-based SettlementConfiguration.xsd elements and the Configuration Output File XML sample data is summarized in the tables below.

Please Note: There are elements in the xsd that are currently placeholders and not mapped to the payload file. Unmapped elements are not listed in the mapping tables. Only elements listed in the mapping table will be output as required or optional data elements. Unmapped elements will eventually be removed from the xsd in a future delivery.

<b>CIM based Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
<b>Message Header</b>		
SettlementConfiguration.TimeDate	Date time XML file is written	2004-08-01T09:30:47-08:00
SettlementConfiguration.Source	Name of file	CONFIGURATION_OUTPUT- Version-Status-Generation Date Timestamp  CONFIGURATION_OUTPUT- 40-Approved-2005-05- 23T13.55.25-07.00.xml
<b>Message Payload</b>		
<b>Scheduling Coordinator</b>		
SchedulingCoordinator.name	Unique ID of Scheduling Coordinator used in any exception calculations	100089
<b>Charge Type</b>		
aliasName	Alternate charge type name	CT1
description	Long description of charge type	
name	Unique charge type identifier	CT1_DA_SPIN
docType	Flag to indicate if charge type is for exception handling	TRUE or FALSE
comments	Description of charge type, for example if changed	
effectiveDate	Date time Charge type becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Charge Type is retired	2020-08-01T09:30:47-08:00
factor	Adjustment factor, normally 1	1
chargeOrder	Sequence of calculation, 1 is first, generally precalcs, and 999 is last	1 to 999
frequencyType	Frequency of calculation, daily or monthly	DAY, MTH

CIM based Data	Description & Notes	Valid values / Enumeration
chargeVersion	Change control version of charge type equation, components and Bill Determinants	1234556
totalInterval	Total number of intervals to indicate if charge is 5 minute (300), 10 minute (150) hourly (25) or daily or monthly (1)	1, 25, 150, 300
<b>Charge Type Charge Component</b>		
name	Name of component, for example CT1_DA_SPIN_PRICE	See naming rules
deleteStatus	Flag to indicate logical deletion of charge component	TRUE or FALSE
effectiveDate	Date time Charge type component becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Charge Type component is retired	2020-08-01T09:30:47-08:00
type	Unit of measure such as Amount, Quantity and Price	AMOUNT, PRICE, QUANTITY
sum	Flag to indicate component is summed	
roundOff	Precision of component output (maximum 9)	0 to 9
equation	Actual charge equation using Excel like formulas and Bill Determinant names	See Business Practice Manual for examples (-1) * BA_HRLY_LCTN_DA_NSPIN_C AP*HRLY_ZONAL_DA_NSPIN_MC
<b>Charge Type Charge Component Bill Determinant</b>		
aliasName	Long form name of Bill Determinant	
description	Full name of Bill Determinant	
name	Unique name of Bill Determinant . See Bill Determinant naming Rules	
mrid	System Generated Unique Sequential Identifier	1,2,3,...99999
docType	Flag to indicate if exceptional Determinant	
unitOfMeasure	Bill Determinant unit of measure, for example MWH	MW, MWH, \$

<b>CIM based Data</b>	<b>Description &amp; Notes</b>	<b>Valid values / Enumeration</b>
numberInterval	Total number of intervals to indicate if charge is 5 minute (300), 10 minute (150) hourly (25) or daily or monthly (1)	1, 25, 150, 300
source	Bill Determinant source if a primary (input) bill determinate and not calculated	
roundOff	Precision in decimals of Bill Determinant values	0 to 9
exception	Bill Determinant exception flag	
frequency	Frequency data is received, DAY or MONTHLY	Day
factor	Adjustment factor to values, normally 1	1
primaryYN	Flag to indicate if Bill Determinant is a direct input. TRUE is an input, FALSE is calculated	TRUE, FALSE
deleteStatus	Flag to indicate if logically deleted	
referenceFlag	Reference name if standing data	
reportable	Flag to indicate if Bill Determinant is to be included on statement. BA will only see Bill Determinants where flag = TRUE	TRUE
effectiveDate	Date time Bill Determinant becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Bill Determinant is retired	2020-08-01T09:30:47-08:00

<b>Charge Type Charge Component Bill Determinant Attribute List</b>		
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AttributeList.Sequence	Attribute sequence number	
AttributeList.Name	Attribute name, for example LOCATION or INTERCHANGE that applies to the charge type	LOCATION
AttributeList.Value	Y if Attribute exists for the Bill Determinant or blank if attribute does not exist	Y

<b>Charge Type Attribute List</b>		
-----------------------------------	--	--

AttributeList.Sequence	Attribute sequence number	
AttributeList.Name	Attribute name, for example LOCATION or INTERCHANGE that applies to the charge type	LOCATION
AttributeList.Value	Y if Attribute exists for the Charge Type or blank if attribute does not exist	Y

CIM based Data	Description & Notes	Valid values / Enumeration
<b>Charge Type Attribute Property</b>		
sequence	Attribute sequence number to which property applies.	1, 2 up to 30
propertyName	Two properties are supported, sum and exception. Sum indicates a total is performed effectively dropping that attribute at the next level.	SUM, EXCEPTION
propertyValue	<p>True or false is applicable to SUM propertyName; If PropertyValue = TRUE, a total is performed effectively dropping the attribute. If PropertyValue = FALSE, attribute is carried forward to the next level.</p> <p>I, E, or False is applicable to EXCEPTION propertyName; If PropertyValue = I, then bill determinant with the specified AttributeList.Value will be included as input. If PropertyValue = E, then bill determinant with the specified AttributeList.Value is excluded as input. If PropertyValue = FALSE, neither an inclusion nor exclusion applies -- bill determinant will be included as input regardless of AttributeList.Value.</p>	<p>TRUE, FALSE</p> <p>I, E, FALSE</p>
<b>Charge Group</b>		
description	Full name of Charge Group	"FERC FEES", "UDP" etc
name	Unique Charge Group short code	FERC, MKT, GMC, ANC_SRV
mrid	Unique identifier	333
marketCode	Market defaulted to Market	MARKET
effectiveDate	Date time Major Group becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Major Group is retired	2020-08-01T09:30:47-08:00
<b>Charge Group Attribute list</b>		
Sequence	Attribute sequence number	
Name	Attribute name, for example LOCATION or INTERCHANGE that applies to the Charge Group in total	LOCATION
Value	Valid value for specific attribute	Varies by attribute

CIM based Data	Description & Notes	Valid values / Enumeration
<b>Charge Group Parent Charge Group</b>		
Index A	Unique ID of Charge group that is parent of charge Group	100089
<b>Major Charge Group</b>		
name	Unique name of major group used for scheduling runs, such as SETTLEMENT_DAILY_INITIAL_MARKET. Separated into daily and monthly and initial, recalculation, and rerun types.	SETTLEMENT_DAILY_INITIAL_MARKET, SETTLEMENT_DAILY_INITIAL_CREDIT, SETTLEMENT_DAILY_RECALC_MARKET SETTLEMENT_DAILY_RERUN_MARKET SETTLEMENT_MONTHLY_INITIAL_CREDIT, SETTLEMENT_MONTHLY_INITIAL_MARKET, SETTLEMENT_MONTHLY_RECALC_MARKET SETTLEMENT_MONTHLY_RERUN, SETTLEMENT_HISTORIC_INITIAL_MARKET, SETTLEMENT_HISTORIC_RECALC_MARKET,
runType	Settlement, Billing or Invoice run type. Only Settlement configuration is provided in output	SETTLEMENT
runVersion	Initial, Recalculation or Rerun	INITIAL, RECALC
frequencyType	Daily or Monthly	DAY, MTH
invoiceType	Invoice that the settlement run will appear on. Market or RMR invoice type	MARKET, RMR
effectiveDate	Date time Major Group becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Major Group is retired	2020-08-01T09:30:47-08:00

CIM based Data	Description & Notes	Valid values / Enumeration
requireAutorun	Whether job is automatically (for example initial) or manually scheduled	
<b>Bill Determinant</b>		
aliasName	Long form name of Bill Determinant	
description	Full name of Bill Determinant	
name	Unique name of Bill Determinant . See Bill Determinant naming Rules	
mrid	Unique sequential number	
docType	Flag to indicate if exceptional Determinant	
unitOfMeasure	Bill Determinant unit of measure, for example MWH	MW, MWH, \$
numberInterval	Total number of intervals to indicate if charge is 5 minute (300), 10 minute (150) hourly (25) or daily or monthly (1)	1, 25, 150, 300
source	Bill Determinant source if a primary (input) bill determinate and not calculated	
roundOff	Precision in decimals of Bill Determinant values	0 to 9
exception	Bill Determinant exception flag	
frequency	Frequency data is received, DAY or MONTHLY	Day
factor	Adjustment factor to values, normally 1	1
primaryYN	Flag to indicate if Bill Determinant is a direct input. TRUE is an input, FALSE is calculated	TRUE, FALSE
deleteStatus	Flag to indicate if logically deleted	
referenceFlag	Reference name if standing data	
reportable	Flag to indicate if Bill Determinant is to be included on statement. BA will only see Bill Determinants where flag = TRUE	TRUE
effectiveDate	Date time Bill Determinant becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Bill Determinant is retired	2020-08-01T09:30:47-08:00
<b>Bill Determinant Attribute List</b>		

CIM based Data	Description & Notes	Valid values / Enumeration
AttributeList.Sequence	Attribute sequence number	
AttributeList.Name	Attribute name, for example LOCATION or INTERCHANGE that applies to the charge type	LOCATION
AttributeList.Value	Valid value for specific attribute . Only populated on input	Varies by attribute
Charge Component		
name	Name of component, for example CT1_DA_SPIN_PRICE	See naming rules
deleteStatus	Flag to indicate logical deletion of charge component	TRUE or FALSE
effectiveDate	Date time Charge type component becomes effective	2004-08-01T09:30:47-08:00
terminationDate	Date time Charge Type component is retired	2020-08-01T09:30:47-08:00
type	Unit of measure such as Amount, Quantity and Price	AMOUNT, PRICE, QUANTITY
sum	Flag to indicate component is summed	Y
roundOff	Precision of component output (maximum 9)	0 to 9
equation	Actual charge equation using Excel like formulas and Bill Determinant names	See Business Practice Manual for examples (-1) * BA_HRLY_LCTN_DA_NSPIN_C AP*HRLY_ZONAL_DA_NSPIN_MC

**Note:** BillDeterminant can be at both MessagePayload and MessagePayload / ChargeType / ChargeComponent levels. The one under MessagePayload lists all BillDeterminants. The one under ChargeType/ChargeComponent is used to establish a relationship between ChargeComponent and BillDeterminant.

#### 4.8.4 SETTLEMENTCONFIGURATION SCHEMA

Reference XSD file that is available on CAISO website as indicated in Section 1.3.



#### **4.8.5 SETTLEMENTCONFIGURATION.XSD**

Current version of file is available on CAISO website as indicated in Section 1.3.