Market Results Interface- Settlements (MRI-S)
(Settlement Quality Meter Data Submission)

Version 1.4
03/15/17

Document Owner: Metering and Market Services Compliance

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REVISION HISTORY

VERSION NO. (Must match header)	DATE	REVISED BY	DESCRIPTION
1.0	06/27/16	Monica M.	Created document for Phase I of the Meter Data component of the MRI-S UI application.
1.1	07/25/16	Monica M.	Modified Terms and Definitions. Added clarification language for UAA responsibilities.

1.2	03/03/17	Monica M.	Added clarifying language and screen shots to incorporate Phase II MRI-S Enhancements for the Meter Data component of the MRI-S UI application.
			• Updated Acceptable Use Policy (AUP) for the meter data submission max acceptable size from **10 MB** to **15 MB** uncompressed.
			• Updated Acceptable Use Policy (AUP) for the max meter data retrieval from **100,000** records to **200,000**.
			• MRI-S shall display two new columns to specify the IntervalEndTime in GMT and PPT time zones.
			• On the UI, MRI-S shall display the following fields as filter criteria on the Meter Data screen in addition to all the existing fields:
			  o Resource Type
			  o Measurement Type
			  o UOM
			  o Interval Length
			  o UpdateSinceDateTime
			• MRI-S shall display the Settlement Data on a separate grid instead of being combined with the Meter Data as is done currently.
			• MRI-S shall ensure that the SC ID or ACL group being specified for the retrieve request is provisioned to the user. If not, the request shall be rejected with an error.

03/13/17	1.3	Monica M.	Made corrections to the following: 1. Number 4 of the "Sample of CSV files for # 4, VALUE. Decimal values can have up to 8 digits. 2. Use policy for records retrieved. Maximum allowed is **200,000** records. 3. User policy for attachments. Maximum allowed is **15** MB. 4. Error codes: <SOAP Fault>. Made updates for the Use policy related to the maximum records retrieved and attachment size.
03/15/17	1.4	Monica M.	Added clarification language to the batch status section.

California ISO	**Operations**	**ISO Version:**	1.4
Market Results Interface- Settlements (MRI-S) (Settlement Quality Meter Data Submission)		**Effective Date:**	03/14/17

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Purpose

To provide external Market Participants with the instructions on perform the following functions within the Meter Data component of the CAISO's Market Results Interface – Settlements (OMAR Replacement) User Interface (MRI-S) UI application.

Acronyms

Term	Definition
AARF	Application Access Request Form
API	Application Programing Interface
Authorized ACL Group	The Authorized ACL Group section displays a list of the Access Control List (ACL) groups that isolate and grant access to a single asset (or group of assets). This group only has read only access.
CAISO	California Independent System Operator
CIM	Common Information Model
CMA	Common Multiple Application
CSV	Comma Separated Value
ECN	Electronic Communication Network
Flowgate	Any schedule flow between two substations. In the metering space, an intertie and/or citigate is referred to as a flowgate.
GMT	Greenwich Mean Time
ISOME	ISO Metered Entity
LDAP	Lightweight Directory Access Protocol
MDEF	Meter Data Exchange Format
MPP	Marker Participant Portal page
mRID	Market Resource. Resource ID as defined in the CAISO Master File.
MRI-S	Market Results Interface - Settlements
NMS	New Metering Solution
PDT	Pacific Daylight Time. Currently has same time zone offset as PDT (UTC -7) but different time zone name. Pacific Daylight Time (PDT) is 7 hours behind Coordinated Universal Time. This time zone is a Daylight Saving Time zone and is used in: North America.

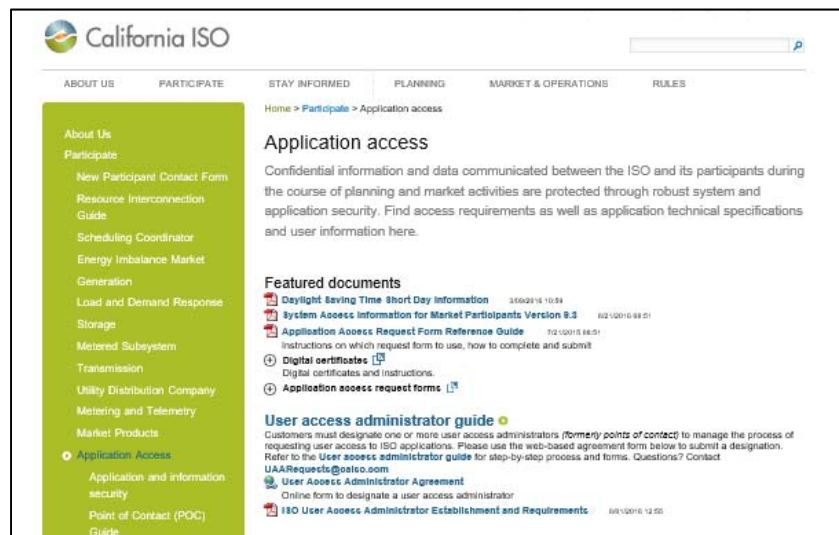| PST	Pacific Standard Time
RQMD	Revenue Quality Meter Data
SC	Scheduling Coordinator
SCID	Scheduling Coordinator ID
SCME	Scheduling Coordinator Metered Entity
SQMD	Settlement Quality Meter Data
UAA	User Access Administrator. This terminology replaces the term Point of Contact (POC) to better reflect the role of the person responsible for administering the user access for their organization. The UAA will have to sign the UAA agreement through DocuSign. The agreement is sent to the signer and to the UAA Requests mailbox at UAARequests@caiso.com.
XML	Extensible Markup Language
XSD	XML Schema Definition

Manage User Authentication and Authorization

Requesting for MRI-S Application Access through the UAA

To request for application access, the request must come from a designated User Access Administrator (UAA) formerly known as the Point of Contact (POC) at your organization.

The UAA shall use Access identity Management (AIM) to manage access for the user(s), Scheduling Coordinators (SCs), and resource level granularity.

http://www.caiso.com/participate/Pages/ApplicationAccess/Default.aspx

More information on how to submit a request for application access can be found at: http://www.caiso.com/Documents/ISO-UserAccessAdministratorEstablishment-Requirements.pdf

Digital Certificates

Access to the MRI-S application will require a Common Multiple Application (CMA) digital certificate for authentication.

Access to the application will be based on ISO standards for role based authorization, which allows multiple user roles and access rights (i.e. SC, third party, etc.)
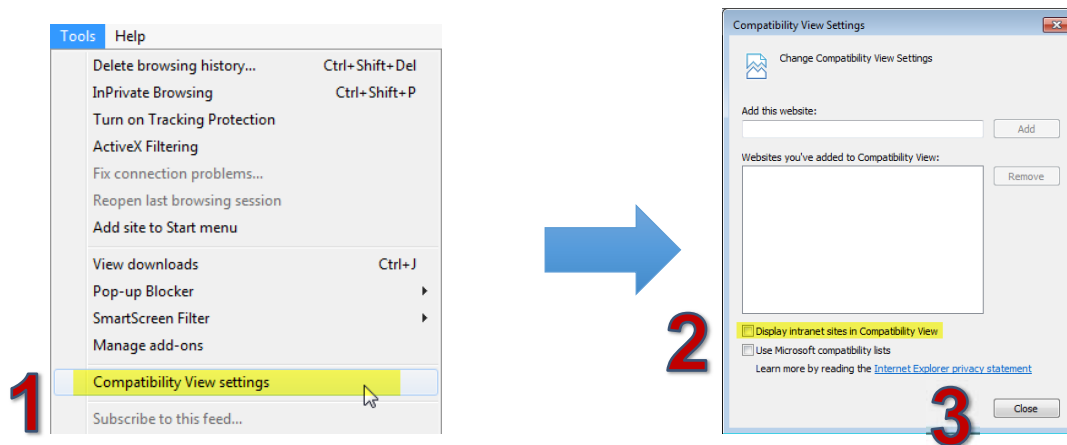
Manage Application Configuration

Web Browser (Internet Explorer (IE))

Market Participants have the option to use any browser type(s); however, please note that **CAISO can only supports IE 11 issues**.

Example: If a user is experiencing an issue while uploading a file during the Batch file submission, such as the field name and other applicable fields not populating, please perform the following:

- Make sure that you have the correct IE11 settings
- Go to **Tools → Compatibility View settings**.
- Uncheck the *Display internet sites in Compatibility View* box
- Click **Close**.
- Re-open the MRI-S application. This should resolve the issue.

Accessing MRI-S Application via Portal

Access to the *Market Participant Portal page (MPP)* is required and can be requested for through AIM.

Note: If the user already has a CMA certificate for other application access, the user does not need to request for MPP. If the user does not have a CMA certificate, the UAA will need to request access to the MPP along with MRI-S via AIM.

1. Once the user has opened the portal page, click on the "MRI-*S*" icon. This will enable the MRI-Settlements link to open up in a new window.
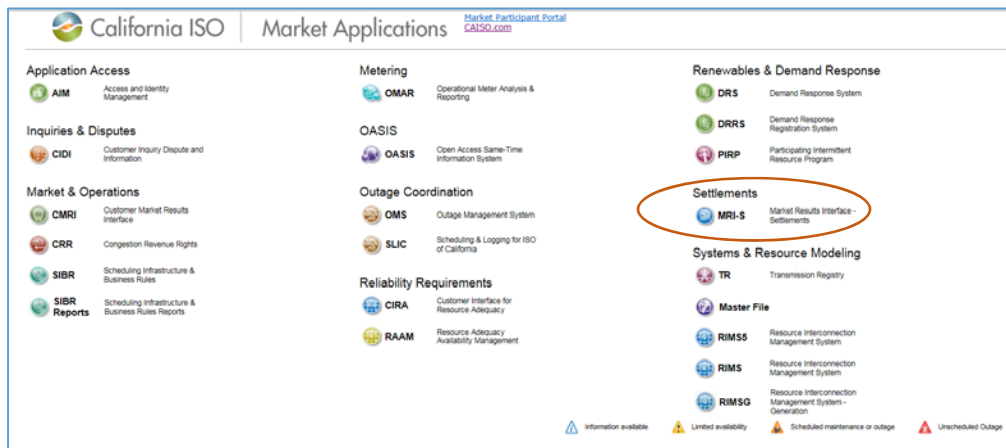
Note: When opening up the MRI-S application, a window may flash and disappear with no error message. This occurs when launching a new session of the UI. To avoid this, users can go to the Pop Up blocker setting to turn off the browser. More information related to this subject can be found at http://www.caiso.com/Documents/MRI-SettlementsFAQs.pdf

2. Before the MRI-S application can be displayed, the user will be prompted to select the applicable CMA certificate.

3. Once in the MRI-S application, the user's view will be based on the role the user was provisioned.

Manage User Roles and Functionalities

There are two external roles for the Meter Data component of MRI-S, which are listed below:

Role Type	LDAP Roles	Descriptions

Meter Write	app_mristlmt_meter_write_ext	User **will have** visibility to **both** the **Meter Data** & **Batch Status** sub tabs.
		
		Meter Data tab:
		• Can view, filter, and export page contents from both the Meter Data and Settlement Data grid views.
		• Can use Manage User Filters functionality.
		
		Batch Status tab:
		• Can upload file, view, sort, and filter Batch IDs.
		• Can export contents from the Batch ID and Batch Error grid views.
		• Can upload batch files via API or UI.
		    ○ For API, user must use XML format.
		    ○ For the UI, user can use CSV, MDEF, and XML.

Meter Read	app_mristlmt_meter_read_ext	User **does not have** visibility to the **Batch Status** tab. **Meter Data tab**: • Can perform all the functions as users with Meter-Write access. • However, the user does not have the capability to export contents from the Meter Data or Settlement Data grid views.

Manage Meter Data tab

Users with multiple Scheduling Coordinator ID (SCID) have the flexibility to select all or specific SCID(s) for meter data management. This functionality would be performed within the session in the *Meter Data* tab. Meter trade date and interval ID within the UI is displayed PPT time zone. API meter data is displayed in GMT. SQMD exported from MRI-S are displayed in GMT format.

In the *Meter Data* tab, users can manage the following functions based on the permission level.
1. Filters
2. View SQMD [includes Versioning]
3. Export Page Contents
4. Manage User Filters

Filters

Users can use the filter functionality to narrow down the search option. Below are a list of filter options:

- Trade Dates (From and To) [required]
- SCID/ACL Group [required]
- Resource [optional]
- UOM [optional]
- Interval Length [optional]
- Measurement Type [optional]
- Resource Type [optional]
- User Filter [optional]
- User Filter Resource [optional]
- Update Since Data Time [optional]

To retrieve the meter data for review, users can use the filter options to input the desired information. Below are the steps:

1. Input the trade dates in the **From** and **To** fields. Note: User(s) can now retrieve a span of 31 days.
2. Select the **SCID/ACL Group** from the drop down list. Note: All the other fields are optional. If no interval length is specified, MRI-S shall provide the data using the default interval length for each resource as specified in the master file.
3. Click **Apply** to execute the search.
4. Click **Reset** to clear the search [optional].

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View SQMD

Users can view retrieved meter data based on the filter options. MRI-S shall ensure that the SC ID or ACL group being specified for the retrieve request is provisioned to the user. If not, the request shall be rejected with an error. Based on the user roles as mentioned in the previous section, below are Meter Data tab screenshot examples.

Meter-Write:
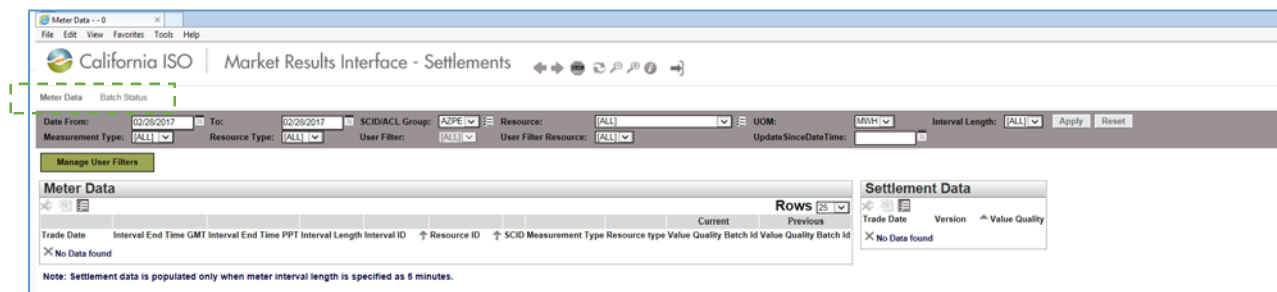
Meter-Read: [Note that the Batch Status tab is not available for users with Meter Read access]

Versioning

Under the *Meter Data* tab, MRI-S will maintain two versions for a given data set: CURRENT and PREVIOUS. All prior versions **will not** be maintained.

Versions will be displayed only in the *Meter Data* view and not the Batch Status view. If no version is specified, then the default is CURRENT.
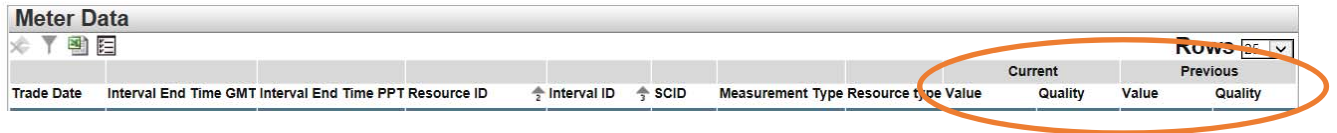
Important: Users can submit as many versions until T+172B; however, the Scheduling Coordinator may be subject to Rules of Conduct if the data is late (submitted after T+48B)**.**

For any new submissions after the published settlement statement date, the following versioning transition will occur:

1. The newly submitted values would appear under the CURRENT Column.
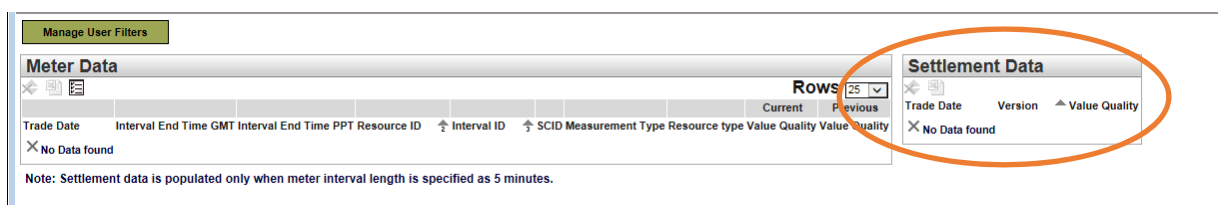2. The former values should shift to the PREVIOUS column.

New Feature: In the *Meter Data* tab view, the **Settlement Data** grid is part of the new MRI-S Enhancement. This grid shall display the settlement values that were published according to the settlement timelines for the respective resource.

Note: Data will only be displayed if the following conditions are met:

1. SQMD has already been published according to the settlement timelines, and
2. The Interval Length filter option is listed as 5 (for 5 min-intervals). This is due to the fact that MRI-S stores the meter value in meter interval length of 5 minutes for Settlements purposes.

The Settlement grid view contains the following headers:

1. Trade Date
2. Version
3. Value
4. Quality

Export Page Contents

This *export* functionality allows users to export the contents from the Meter Data or Settlement Data grid. When exporting the data, please note that the system only allows the user to export one grid view at a time.

To export the retrieved meter data, below are the steps:

1. Once the meter data has been populated in either grid views, left-click on the excel icon and select **Export All.**
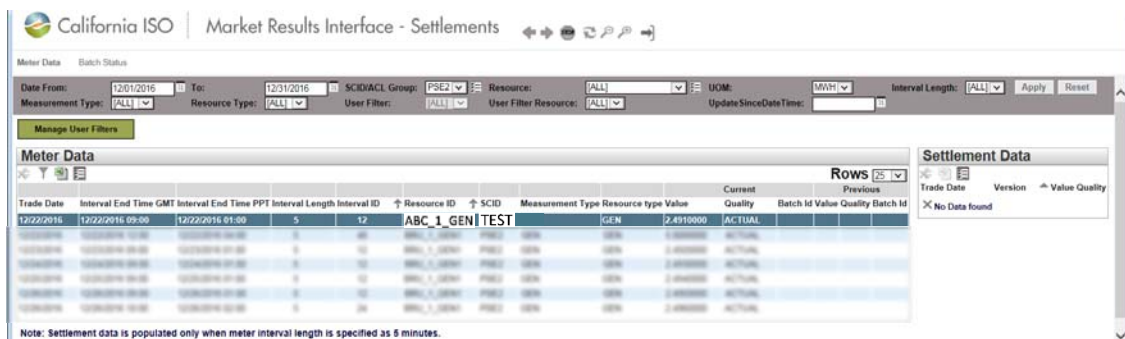
2. You will be prompted to open the file. Click **Open.**

3. If you receive a second prompt, click **Yes** to accept.
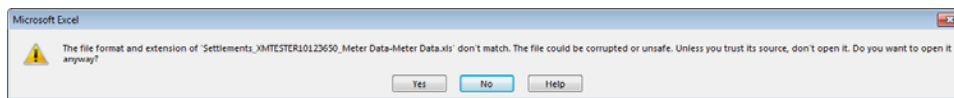
4. If you receive a "PROTECTED VIEW" prompt, click Enable Editing.

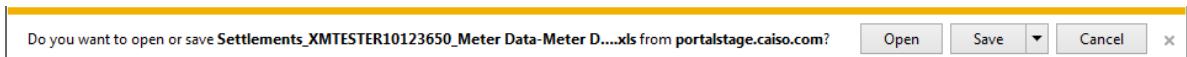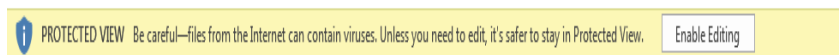| Owner: Metering Analysis and Market Services Control	Market Services Support
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5. After that, the user can modify the document as needed.

Below is an example of an exported file.

Trade Date	Interval End Time GMT	Interval End Time PPT	Interval Length	Interval ID	Resource ID	SCID	Measurement Type	Resource type	Current Value	Current Quality	Current Batch Id	Previous Value	Previous Quality	Previous Batch Id
01/01/2017	01/02/2017 01:00	01/01/2017 17:00	5	204	ABC_1_UNITS	PCG2	GEN	GEN	10.0000000	ESTIMATED		10.0000000	ESTIMATED	
01/01/2017	01/02/2017 01:05	01/01/2017 17:05	5	205	ABC_1_UNITS	PCG2	GEN	GEN	10.0000000	ESTIMATED		10.0000000	ESTIMATED	
01/01/2017	01/02/2017 01:10	01/01/2017 17:10	5	206	ABC_1_UNITS	PCG2	GEN	GEN	10.0000000	ESTIMATED		10.0000000	ESTIMATED	
01/01/2017	01/02/2017 01:15	01/01/2017 17:15	5	207	ABC_1_UNITS	PCG2	GEN	GEN	10.0000000	ESTIMATED		10.0000000	ESTIMATED	
01/01/2017	01/02/2017 01:20	01/01/2017 17:20	5	208	ABC_1_UNITS	PCG2	GEN	GEN	10.0000000	ESTIMATED		10.0000000	ESTIMATED	
01/01/2017	01/02/2017 07:00	01/01/2017 23:00	5	276	ABC_1_UNITS	PCG2	GEN	GEN	15.0000000	ESTIMATED		15.0000000	ESTIMATED	
01/01/2017	01/02/2017 07:05	01/01/2017 23:05	5	277	ABC_1_UNITS	PCG2	GEN	GEN	15.0000000	ESTIMATED		15.0000000	ESTIMATED	
01/01/2017	01/02/2017 07:10	01/01/2017 23:10	5	278	ABC_1_UNITS	PCG2	GEN	GEN	15.0000000	ESTIMATED		15.0000000	ESTIMATED	
01/01/2017	01/02/2017 07:15	01/01/2017 23:15	5	279	ABC_1_UNITS	PCG2	GEN	GEN	15.0000000	ESTIMATED		15.0000000	ESTIMATED	
01/01/2017	01/02/2017 07:20	01/01/2017 23:20	5	280	ABC_1_UNITS	PCG2	GEN	GEN	15.0000000	ESTIMATED		15.0000000	ESTIMATED	

The **Interval End Time GMT** and **Interval End Time PPT** columns are part of the new features when exporting data from the *Meter Data* tab.

Manage User Filters

This *Manage User Filter* functionality is <u>specific</u> to the individual user. The user can create a custom list for the purpose of filtering. This will allow the user to manage the SCID and Resources that they have been provisioned for.

To create a user filters group, the following shall be performed:
1. Under the *Meter Data* view, click on the Manager User Filters button.
2. Click on the pencil icon to create a *New Row*. [See figure 1.1]
3. Input a *User Filter Name*. [See figure 1.2]
4. Click **Update** to save the group.
5. Once it has been saved, click on the green Edit button to customize the resource selection. [See figure 1.3]
6. The list on the left side is the *Available* Resources. The list on the right side are the *Selected* Resources. Click on the arrow buttons to add or remove resources. [See figure 1.4]
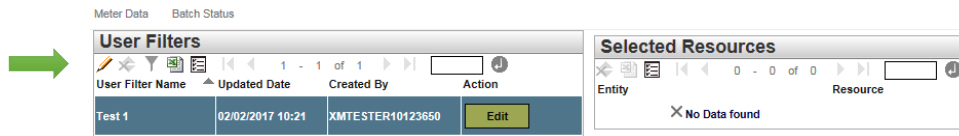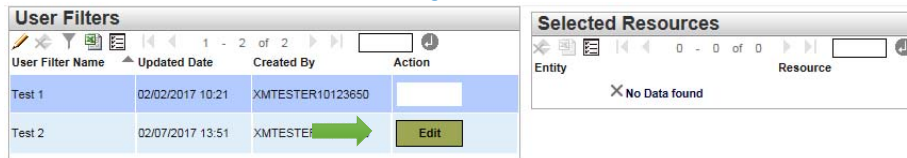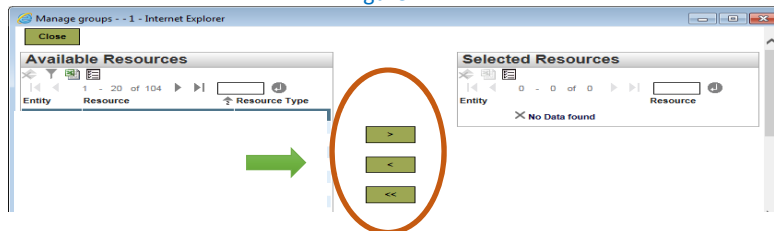7. Click **Close** when done.

Figure 1. 1

Figure 1. 2

Figure 1. 3

> **Important:**
> Users have the ability to create new and edit existing user filter group(s). Once the **User Filter group(s)** have been created, they cannot be deleted.

Figure 1. 4

Manage Batch Status tab

User(s) with the appropriate access can manage the following through the MRI-S UI under the Batch Status tab:
1) Filters (Batch ID, Batch Status, User ID, File Type)
2) Upload file(s)
3) View (Batch Status and Batch ID grid contents)
4) Export (Batch Status and Batch ID grid contents)

Note: A list of Batch submission validation error codes, refer to **Attachment B.**

Filters

Users can use the optional filter functionality to narrow down the search. Below are a list of filter options:

- Batch ID [optional]
- Batch Status (SUCCESS and ERROR) [Defaults to [ALL]]
- User ID [optional; can use keywords]
- File Type (CSV, MDEF, XML) [Defaults to [ALL]]
- Interval Length [optional]

To retrieve a list of Batch Statuses, users can use the any of the filter options to input the desired information and then click **Apply** to execute the search.

Upload Files

User(s) have the option to submit SQMD via API or UI. In this user guide, the focus will be on the MRI-S UI. The UI allows Scheduling Coordinators (SCs) to submit SQMD for the SCID(s) that they are provisioned for. Multiple SCIDs may be issued to the user(s) as long as they are the provisioned SC. There is no limitation on the number of users per SCID.

To upload a file via the UI in MRI-S, please perform the following:

1. Go to the Batch Status tab.
2. Click on the Upload File option.
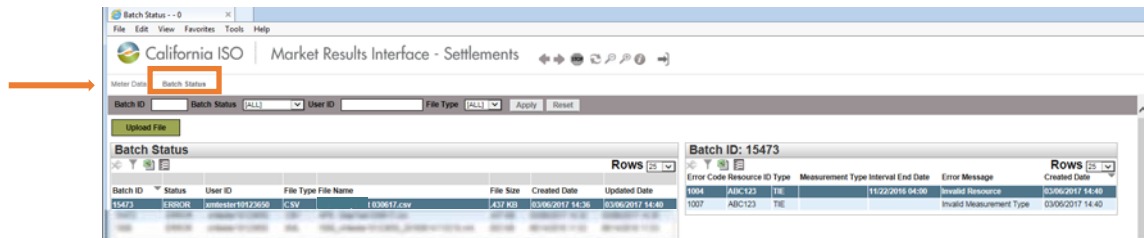
3. Click on Browse to select the file.

4. Once the file has been selected, the data file information should be populated onto the applicable fields as shown below. Click **Submit** to complete the upload.

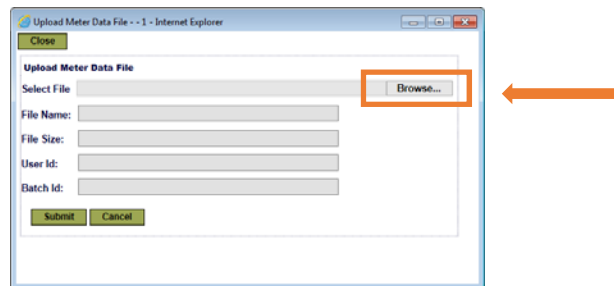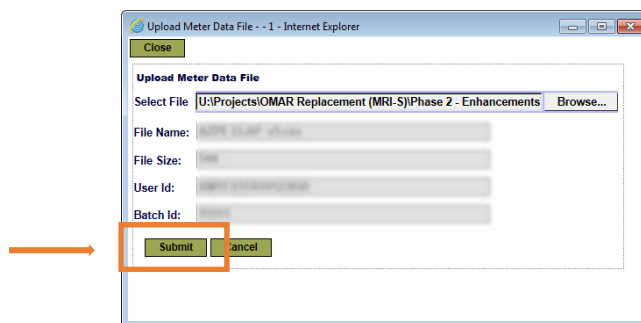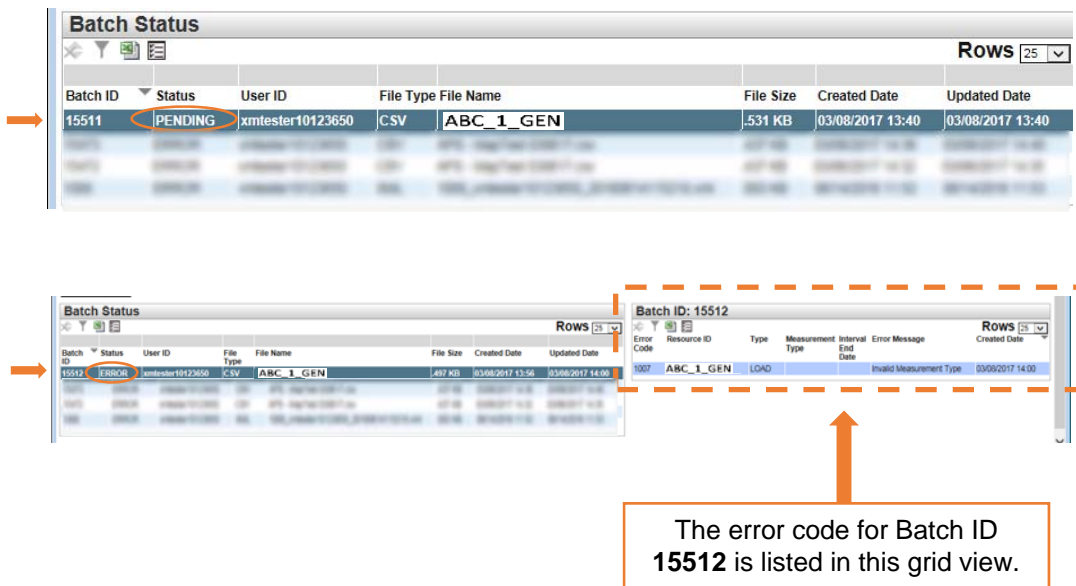| Owner: Metering Analysis and Market Services Control	Market Services Support
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5. Please be sure to validate that the status of the submission to ensure that the file did not fail.

- If the submission is rejected (ERROR), please be sure to re-submit the file.
- If the submission is successful (SUCCESS), no further action is required. However, do not forget to validate that all the intervals are accounted for under the Meter Data tab view.

Below is an example of a submission that failed. It went from **PENDING** to **ERROR**.

The error code for Batch ID **15512** is listed in this grid view.

If the output of the *Batch Status* is displayed as **SUCCESS**, this means that submitted file has been accepted.

If the output of the *Batch Status* is displayed as **ERROR**, this means that the file has been rejected. Please refer to the Batch ID grid within the Batch Status tab for more details.

Although the system <u>does</u> allow partial data submissions, it is still the responsibility of the SC to ensure that all the applicable meter data intervals have been submitted and accounted for.

Please ensure that all meter data submissions are submitted in a timely manner according to the CAISO Settlement Payment Calendar. CAISO strongly recommends that the SC establishes a validation control to ensure that <u>all</u> the meter data interval(s) are accurately accounted for. If there are no controls in place to flag any potential discrepancies, the UDC's UFE may be impacted and/or the SC may be subject to Rules of Conduct.

As part of the new enhancement, MRI-S will be monitoring the submitted meter values for each market resource by comparing the submitted values against the registered PMax value in the CAISO Master File.

- If the meter values exceed the registered PMax, a **WARNING** message will be generated to alert the SCs under the Batch Status tab.
- Instead of receiving a SUCCESS or ERROR message, the results will be displayed as **WARNING**.
  - o If the PMAX warning is the only validation error associated to the data being submitted, MRI-S shall accept the meter value and the submission result will be displayed as **WARNING**. In these instances, please refer to the Batch ID grid (located on the right-side) associated to that specific Batch ID for more details.
  - o However, if there is another error code in addition to the Pmax warning, MRI-S will reject the file and the submission result will be displayed as **ERROR**.
- In essence, meter data submitted <u>will not</u> be rejected if the meter value exceeds the registered PMax unless there are other errors involved.

For SCME resources, it is recommended that the SC monitors the WARNING statuses under the Batch Status tab in the event that it may require subsequent actions, such as updating the GRDT through Master File. Nonetheless, it is at the discretion of the SC and/or Generator Owners.
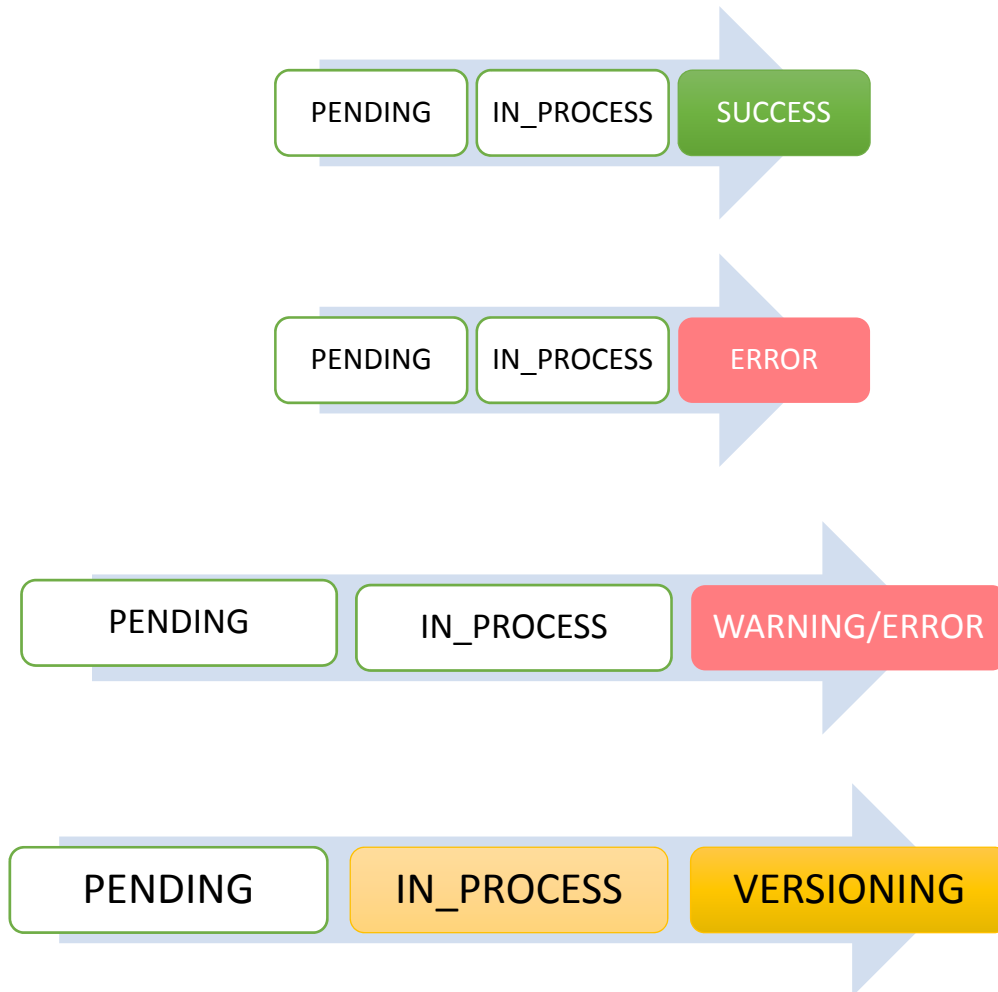
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Below is a list of potential batch status sequences:

File Types

This section will describe the three different File Type Submissions (CSV, MDEF, and XML).

1. **CSV File Requirements**
   - These seven field names identified below are required for .csv file submission.
   - The field names are not case sensitive.
   - The file will not use text qualifiers such as single quote or double quote characters.
   - The file will use ANSI characters with CRLF to separate records.
   - All inbound files shall be submitted in GMT format.
   - All file records will be consistent with respect to a single time format.
   - Inbound file extension must be ".CSV".
   - Filename length must not exceed 255 characters, including the extension.
   - Filename is case insensitive.

   To view samples of CSV file(s), refer to **Attachment C.**

Order	Header Fields	Description	Example of Valid Values
1	RES_ID	Market Resource ID as defined in the CAISO Master File with underscores. (Max length 32 alphanumeric characters).	ABC_1_TEST
2	MSMT_TYPE	This is the measurement type. Measurement types are the same as the channel ID in the current metering solution. LOAD is channel 1 and GEN is channel 4. (Max length is 4 text characters)	"GEN" or "LOAD"
3	INTERVAL_END_TIME	Must be in GMT Format End Date time in GMT of the interval for which the meter value is being submitted or retrieved. This is interval ending. (Max length is 29 characters)	2016-02-01T00:00:00.000+00:00
4	VALUE	Meter value or Meter Quantity. Decimal values should be (16, 8), meaning up to 8 digits before and after the decimal point.	1.12345678

5	UOM	Unit of Measure. "k" for kWh or "M" for MWh. (Max length is one text character) Note: Values are case sensitive.	"k" or "M"
6	INTERVAL_LENGTH	This is the interval length of the trading time in minutes. (Max length is 2 integers) Note: The interval length should be the same for the trade date. For example, if the prior submission for the date happened in 5 minute intervals, all further revisions to the same date should be submitted with the same interval length. This information would have been provided to CAISO Master File via GRDT.	"5", "15", or "60"
7	MSMT_QUALITY	Quality of the measurement. "A" = Actual and "E" = Estimated (Max length is one text character)	"A" or "E"

2. MDEF Requirements

MDEF must be formatted on GMT. For more information on MDEF GMT configuration, please contact ITRON support.

For MDEF File Specification, refer to section 10 of the Post-Market Consol - OMAR Replacement ISO Interface Specification document at http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=53D6EA67-9F4A-434D-8C41-BAA46169A237

3. XML Requirements

Requirements and samples of various XML file(s) can be found on the Interface Specification documentation located at http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=53D6EA67-9F4A-434D-8C41-BAA46169A237

View

This functionality allows users to view the contents listed under the Batch Status and Batch ID grids.

Under the *Batch Status* grid, users can modify the column headers. Below is a list of column options:

- Batch ID
- Status
- User ID
- File Type
- File Name
- File Size
- Created Date
- Updated Date

Under the *Batch ID* grid, users can modify the column headers. Below is a list of column options:
- ID
- Batch ID
- Error Code
- Resource ID
- Resource Name
- Type
- Measurement Type
- Interval End Date
- Error Message
- Error Code Description
- System Error Description
- Created Date

Note: On the UI, MRI-S shall allow other users belonging to the same organization to view the submission status of the files submitted by another user.

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Export Page Contents

Similar to the steps outlined under the Meter Data tab, the export function under the Batch Status view allows users to export the contents under the **Batch Status** and **Batch ID** grids using the excel icon.

Batch File Submission Specifications

Specifications	Performance	Adjustments
Maximum acceptable size of the attachment	15 MB (Uncompressed)	SCs can adjust either the trade date range or the number of resources being submitted to adhere to this requirement. The following error message will be generated, "Use policy violated with an attachment of size XX* MB. Maximum allowed attachment size is 15 MB."
Average response time for standard output for a submit	<5 Seconds	
Average wait time for batch validation to be completed	5 Minutes	

Average time to retrieve meter data up to 200,000 records	<60 Seconds	For meter data retrieve, system will use the number of database records in the resulting data set to control the volume and performance. The system will do a count for the number of records requested and will limit this to 200,000. SCs can use the keyword ALL for the four distinct resource types and can also control the trade date interval being requested so that the resulting data set is within the limit of 200,000 records. Any retrieve request that results in more than 200,000 database records being retrieved will result in the following error being generated: Use policy violated with YY** records retrieved. Maximum allowed is 200,000 records.

Interfaces

This section briefly describes the submission requirements for the API and UI.

1. **Application Programming Interface (API)**
   The SQMD:
   - i.   Must be formatted as XML
   - ii. Must be in GMT
   - iii. Must contain the required header attributes

2. **User Interface (UI)**
   The SQMD:
   - i.   Must be formatted as MDEF (.mde), Comma Separated Value (.csv), and XML
   - ii. Must be in GMT
   - iii. Must contain the required header attributes
   - iv. Can have the meter submitted in either MWh or kWh

Links

Digital Certificates
http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=475C9E28-B79D-40DC-A4D7-F0B25B396D99

POC AARF Reference Guide
http://www.caiso.com/Documents/ApplicationAccessRequestFormReferenceGuide.pdf

ISO User Access Administrator (UAA) Establishment and Requirements
http://www.caiso.com/Documents/ISO-UserAccessAdministratorEstablishment-Requirements.pdf

User Access Administrator Agreement
https://na2.docusign.net/Member/PowerFormSigning.aspx?PowerFormId=4d8a3766-06d8-4074-9371-4df17f745f34

Review of Access and identity Management (AIM) Access Control List (ACL) Functionality
http://www.caiso.com/Documents/Access_IdentityManagementAccessControlListTraining.pdf

Access and Identity Management (AIM) User Guide
http://www.caiso.com/Documents/AccessandIdentityManagement_AIM_UserGuide.pdf

Access and Identity Management (AIM) Training
http://www.caiso.com/Documents/Access_Identity_Management_Training.pdf

Meter Data Exchange Format
https://www.caiso.com/Documents/MeterDataExchangeFormat.pdf

MRI – Settlements External User Guide
http://www.caiso.com/Documents/MRI_SettlementsExternalUserGuideV1_0.pdf

External BRS Post-Market Consolidation - OMAR Online Replacement v1.2 (10/06/15)
http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=53D6EA67-9F4A-434D-8C41-BAA46169A237

ISO Interface Specification OMAR Online Replacement v 1.10
http://www.caiso.com/Documents/OMAROnlineReplacementTechnicalSpecificationCleanV1_10.pdf

External BRS Requirements Specification Post-Market Consolidation – OMAR Online (02/29/16)
http://www.caiso.com/Documents/ExternalBusinessRequirementsSpecification-OMAROnlineReplacement.pdf

BRS v1.0 – MRI-S Metering Enhancements
http://www.caiso.com/Documents/BusinessRequirementsSpecificationv1_0-MRI-SMeteringEnhancements.pdf

MDEF and XML Requirements Specifications:
http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=53D6EA67-9F4A-434D-8C41-BAA46169A23

Artifacts Package – OMAR Online Replacement v.1.5 (11/02/15)
http://www.caiso.com/Documents/ArtifactsPackage_OMAROnlineReplacementv15.zip

Attachments

Attachment A: Toolbar icons and fields

Toolbar Options	Description	Icons
Download Buttons	These buttons enables the user to download the Settlement files in any of the three formats: XML, CSV or PDF. The three buttons are disabled till the user selects the files to be downloaded. MRI provides the user with three columns specifying the format in which the files are available. These formats are made available based on the requests submitted by the SCs. Depending on the format that is available, the CSV, PDF and/or XML columns are checked. When the user selects files in multiple formats, all buttons for those formats become active. For example, if a user selects a file in XML and another in CSV format, both the "Download XML" and "Download CSV" buttons become active as seen below.	
Other Controls	**Inline Filter** button allows the user to have a way to filter the results even further based on the results of the main filtering.	
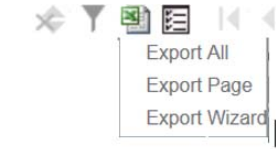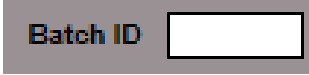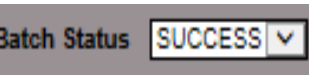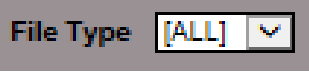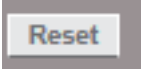
Paging Controls	Enables the user to page through the output sequentially, go to the first or last page, or go to a specific page.	
Previous and Next icon	Allows the user to move to the previous or next display.	
Stop Loading icon	Allows the user to stop loading the display.	
Refresh icon	Allows the user to refresh the current display.	
Zoom Out icon	Allows the user to zoom out of the display.	
Zoom In icon	Allows the user to zoom in on the display.	
Close icon	Allows the user to close the application.	
Batch Status Adjustment Column	**[Optional filter]** Allows the user to customize their column headers under the Batch Status view.	
Batch Errors Adjustment Column	**[Optional filter]** Allows the user to customize their column headers under the Batch Errors view.	

[Excel] Export icon	Allows the user to export the displayed data. Users have three different options to choose from: Export All, Export Page, or Export Wizard.	Export All Export Page Export Wizard
Rows icon	**[Optional filter]** Allows the user to designate the number of rows they want to see on the display. [25, 50, 100, 200, 500]	**Rows** 25
Batch ID field	**[Optional filter]** Allows the user to retrieve the Batch ID by manually typing in the Batch ID #.	**Batch ID**
Batch Status field	**[Optional filter]** Allows the user to specify the Batch Status by selecting from the following options: [ALL], SUCCESS, or ERROR.	**Batch Status** SUCCESS
User ID field	**[Optional filter]** Allows the user to narrow down the search parameter by typing in the User ID.	User ID
File Type field	**[Optional filter]** Allows the user to narrow down the submitted file type by selecting from the following options: CSV, MDEF, or XML.	**File Type** [ALL]
Apply button	Allows the user to initiate the filter selection.	Apply
Reset button	Allows the user to reset the filter selection.	Reset
Date range field	**[Required filter]** Allows the user to specify the date range from and to. Note: Dates must not span more than 31 days.	Date From: 02/02/2017 To: 02/02/2017

SCID/ACL Group field	**[Required filter]** Based on user's role on the CMA digital certificate, this field allows the user to select from a list of SCID(s) or ACL Group(s) that was provisioned to the user.	SCID/ACL Group: [ALL] ∨
Resource field	**[Optional filter]** Based on which SCID or ACL group the user has been provisioned for, this field allows the user select from a list of Market Resources.	Resource: [ALL] ∨
UOM field	**[Optional filter]** Allows the user to narrow down the UOM type for the meter value to be retrieved by selecting from the following options: [ALL], KWH or MWH.	UOM: KWH ∨
Interval Length field	**[Optional filter]** Allows the user to narrow down the Interval Length size (data granularity) by selecting from the following options: [ALL], 5, 10, 15, or 60. Note: If the user does not specify a value, the default is what is specified in the master file for that particular resource. The interval length should be the same for a trade date. For example, if the prior submission for the date happened in 5 minute intervals, all further revisions to the same date needs to be submitted with the same interval length.	Interval Length: [ALL] ∨
Measurement Type field	**[Optional filter]** Allows the user to narrow down the Measurement type by selecting from the following options: [ALL], LOAD, or GEN	Measurement Type: [ALL] ∨
Resource Type field	**[Optional filter]** Allows the user to narrow down the Resource type by selecting from the following options: [ALL], GEN, LI, LOAD, TG, or TIE	Resource Type: [ALL] ∨

User Filter field	**[Optional filter]** Allows the user to select from a list of pre-existing filter groups created by the user.	User Filter: [ALL] ⌄
User Filter Resource field	**[Optional filter]** Allows the user to narrow down the Resource that was established within the User Filter option.	User Filter Resource: [ALL] ⌄
UpdateSinceDateTime field	**[Optional filter]** Allows the user to use an optional timestamp element to request using the UI or API for incremental changes to data since their last retrieve. The user shall be able to specify the trade date(s) and the new optional timestamp element to retrieve only the changes to the data for the trade date(s) that were updated since the new optional timestamp element.	UpdateSinceDateTime: [ ] 🗓

Attachment B: Validation Errors

Note: Anytime you receive error code 1001 or any unlisted error, Market Participant(s) are to submit a CIDI ticket for these instances.

ERROR CODE	ERROR MESSAGE	ERROR DESCRIPTION
1001	Unexpected Error	Unhandled Exception.
1002	Invalid XML	XSD validation errors.
1003	Invalid File	One or many of the mandatory fields are missing in the attachment.
1004	Invalid Resource	The resource ID being specified is not provisioned to the user for the given trade date.
1005	SC submission of data for this resource is not allowed	The resource ID being submitted is not provisioned for SC submission.
1006	Late Meter Data	Trade date submitted is beyond the later meter cutoff date (i.e. after T+8B, T+48B, T+172B depending on the Settlement Payment Calendar timeline)
1007	Invalid Measurement Type	Valid values are LOAD or GEN.
1008	Invalid Time Interval Length	Valid values are 5, 15 or 60 for submission and 5, 10, or 60 for retrieval.
1009	Invalid time format	Interval End Time should be in GMT.
1010	Interval End Time does not match with Time Interval Length	The granularity specified in the Interval Time Length field should match the granularity of the interval end time.
1011	Invalid meter value precision	Valid precision for meter value is (16, 8), i.e. 8 digits before and after the decimal point.

1012	Invalid measurement quality	Valid values are ACTUAL or ESTIMATED.
1013	Version cannot be specified for meter data submission	Version field will only be populated for data retrieve request and response, but cannot be specified in the submission.
1014	Invalid version requested	Valid values for retrieve request are CURRENT, PREVIOUS or HISTORY.
1015	Invalid Resource type	The resource id is associated to a wrong XML element for resource type.
1016	Duplicate data found	Multiple data found for a given resource id, and measurement quality.
1017	Estimated data cannot be provided for this trade date	Estimated data can only be submitted for the recalculation statements until T+48B Midnight for a trade date.
1018	DemandResponseRegistration should not be provided	Meter data for DR Resources are not allowed at this time
1019	Unexpected Security Error	Unhandled exception specific to auth service.
1020	No Access to resources for batch	No Read Access allowed for the resources under this batch id.
<SOAP Fault>	Use policy violated with YY* records retrieved. Maximum allowed is 200,000 records	
<SOAP Fault>	Use policy violated with an attachment of size XX* MB. Maximum allowed attachment size is 15 MB	
<SOAP Fault>	MessageHeader version is missing or invalid	MessageHeader version number is required for backwards compatibility: "v20160301"

1021	Invalid Trade Date	Meter data can only be submitted for up to 7 days in the future.
1022	Invalid Unit of Measurement	Unit of Measurement is not in values [k, M]
1024	Actual data cannot be provided for this trade date	Actual data can only be submitted once the trade date has occurred
1026	Time Interval length does not match meter data interval specified for this resource	Meter data interval as specified per resource in the master file does not match the time interval length being submitted
1027	Invalid measurement type for resource ID	The measurement type specified for the resource ID is not valid.
1028	Meter value of X*MWh exceeds the PMAX of Y*MWh *actual values	Meter value submitted for a resource is more than the registered PMAX in the master file. Note: This is a warning and data will still be accepted.

Attachment C: Sample CSV File Formats

Note: The resource configuration attributes must coincide with the information that were submitted to CAISO Master File; otherwise, the validation will fail causing the file to be rejected.

Below are three sample CSV screenshots where the file formatting are set-up correctly.

Sample 1:

This submission is for a generation resource for trade date 02/01/16, formatted in GMT with kWh values for 5 minute intervals that are for actual values.

RES_ID	MSMT_TYPE	INTERVAL_END_TIME	VALUE	UOM	INTERVAL_LENGTH	MSMT_QUALITY
ABC_6_TEST	GEN	2016-02-01T00:00:00.000+00:00	5000	k	5	A
ABC_6_TEST	GEN	2016-02-01T00:05:00.000+00:00	5002	k	5	A
ABC_6_TEST	GEN	2016-02-01T00:10:00.000+00:00	5002	k	5	A
ABC_6_TEST	GEN	2016-02-01T00:15:00.000+00:00	5003	k	5	A
ABC_6_TEST	GEN	2016-02-01T00:20:00.000+00:00	5004	k	5	A
ABC_6_TEST	GEN	2016-02-01T00:25:00.000+00:00	5005	k	5	A

Sample 2:

This submission is for a flow gate (intertie) or generation resource for trade date 02/01/16, formatted in GMT with kWh values for 5 minute intervals that are for actual values. Note: For flow gates or generation, SCs must include both MSMT_TYPE(s) for "LOAD" and "GEN" for each INTERVAL_END_TIME.

RES_ID	MSMT_TYPE	INTERVAL_END_TIME	VALUE	UOM	INTERVAL_LENGTH	MSMT_QUALITY
TESTGO	GEN	2016-02-01T00:00:00.000+00:00	1000	k	5	A
TESTGO	LOAD	2016-02-01T00:00:00.000+00:00	2000	k	5	A
TESTGO	GEN	2016-02-01T00:05:00.000+00:00	1500	k	5	A
TESTGO	LOAD	2016-02-01T00:05:00.000+00:00	1600	k	5	A
TESTGO	GEN	2016-02-01T00:10:00.000+00:00	1300	k	5	A
TESTGO	LOAD	2016-02-01T00:10:00.000+00:00	1350	k	5	A

Sample 3:

This submission is for a LOAD resource for trade date 02/01/16, formatted in GMT with MWh values for 60 minute intervals that are for estimated values.

RES_ID	MSMT_TYPE	INTERVAL_END_TIME	VALUE	UOM	INTERVAL_LENGTH	MSMT_QUALITY
ELAP_TEST_REST	LOAD	2016-02-01T00:00:00.000+00:00	1000	M	60	E
ELAP_TEST_REST	LOAD	2016-02-01T00:05:00.000+00:00	1020	M	60	E
ELAP_TEST_REST	LOAD	2016-02-01T00:10:00.000+00:00	1050	M	60	E
ELAP_TEST_REST	LOAD	2016-02-01T00:15:00.000+00:00	1600	M	60	E
ELAP_TEST_REST	LOAD	2016-02-01T00:20:00.000+00:00	1300	M	60	E
ELAP_TEST_REST	LOAD	2016-02-01T00:25:00.000+00:00	1350	M	60	E

Attachment D: Sample XML file Formats

Please refer to the current version of the ISO Interface Specification for OMAR Online Replacement document located at:

http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=53D6EA67-9F4A-434D-8C41-BAA46169A237

Attachment E: dateTime Data Type

The dateTime is used to specify a date and a time.

The dateTime is specified in the following form YYYY-MM-DDThh: mm:ss [(+|-) hh:mm:ss] where:

YYYY	indicates the year
MM	indicates the month
DD	indicates the day
T	indicates the start of the required time section
hh	indicates the hour
mm	indicates the minute
ss	indicates the second
+ (plus) or - (minus)	to specify an offset from the UTC time

Sample dateTime format variations supported by OMAR Replacement API:
- 2016-01-26T07:00:00.000-00:00
- 2016-01-26T07:00:00Z

	Daily -0000 offset	
	start	end
Daylight-Savings Time	2014-10-15T07:00-00:00	2014-10-16T07:00-00:00
Non Daylight-Savings Time	2014-11-15T08:00-0000	2014-11-16T08:00-0000
Short Day	2014-03-09T08:00-0000	2014-03-10T07:00-0000
Long Day	2014-11-02T07:00-0000	2014-11-03T08:00-0000