

Draft

Technical Interface Specification For Master File Data Exchange Services

Version: 3.~~65~~

Revision History

| Date | Version | Description |
|-----------|---------|--|
| 05/29/09 | 1.13 | Project First Released Version. |
| 12/15/09 | 2.1 | Project MSG input date introduced into SubmitGeneratorRDT & RetrieveGeneratorRDT Services |
| 2/4/10 | 2.2 | <ul style="list-style-type: none"> Renamed “transitionTime” to “transitionRampTime” Converted “Time” attributes from integer data type to float Added location for B2B Security Specification |
| 06/15/10 | 2.3 | Updated description for CERT_PIRP to include values ‘M’ and ‘Q’. Updated description for PRIOR_TYPE. |
| 1/24/11 | 2.5 | Added SUCostBasis, MLCostBasis, hourlyPredispatch, certifiedDAM, certifiedRTM, and strandedLoad to GRDT. Removed costBasis from GRDT. Added strandedLoad to IRDT. |
| 6/21/2011 | 2.6 | MF changes for 2011 Fall Release (including RDRP, Group Constraints project, as well as maintenance change). |
| 7/6/2011 | 2.7 | Updated to show 2 new Group Constraint (Pump) attributes will be modifiable. Leaving Fuel Cost Curve untouched. |
| 8/5/2011 | 2.8 | Modify Intertie services for Winter Release (NRS RA and other updates). Adding 3 columns, removing 5 columns. |

| Date | Version | Description |
|-----------|---------|---|
| 9/15/2011 | 2.9 | For Interties, moved Stranded_Load after Wheeling Reference Number. |
| 9/30/2011 | 2.10 | Added 5 columns to GRDT for NGR-REM. Made Startup_Ramp_Time read-only at the Resource and Configuration level. Made Cert_Spin, Cert_NSpin_DAM, Cert_NSpin_RTM, and Cert_Reg modifiable. |
| 12/9/11 | 2.11 | Fixed MinOn and MinOff typos. |
| 7/12/11 | 2.12 | Updated for NGR, RMTG, GHG, and MLCA. Added 4 modifiable and 5 non-modifiable attributes to the Generator RDT. Renamed CONT_ENERGY_LIMIT to MAX_CONT_ENERGY_LIMIT in GRDT. Added MLCA (non-modifiable) to Intertie RDT. |
| 11/7/12 | 2.13 | Removed CERT_REG at Resource and Configuration level. Added CERT_REG_DOWN and CERT_REG_UP at Resource and Configuration level. |
| 9/13/13 | 2.14 | Removed RA Flag and RA Capacity from IRDT and GRDT. Removed Default RA Provider and Default RA Path Sequence from GRDT. Added Serve Load Only to IRDT. Added Min Load MMA and Startup MMA to Resource and Configuration (GRDT). Added CERT_BLKSTRT to GRDT. Added RA Range Min and Max to GRDT. Added VER Flag and Forecast Selection for FERC 764. |
| 10/3/13 | 2.14.1 | Renamed FORECAST_OWNER to FORECAST_SELECTION in RDT (xls). |
| 10/10/13 | 2.14.2 | Renamed VER_YN to VER in RDT (xls). Redacted changes |

| Date | Version | Description |
|-------------------|------------|--|
| | | to IRDT since Circular Scheduling is no longer part of Spring 2014. |
| 12/9/13 | 2.14.3 | Added HR_PRE_DISP to IRDT. RA Flag and RA Capacity have been removed from IRDT. Hourly Pre-dispatch is modifiable in GRDT and IRDT. |
| 2/19/2014 | 2.14.4 | Added explanation for namespace differences |
| 03/05/2014 | 3.0 | Added EIM Participation Flag and Host Control Area (BAA). |
| 4/7/2014 | 3.0.1 | Updated per Web Posting request. |
| 5/22/2014 | 3.1 | Added new section for Aggregated Generators |
| 5/29/2015 | 3.2 | Added GHG Cost (EIM Y1) and Startup Flag (CCE2); added Version to Message Header |
| 7/16/2015 | 3.3 | Added 'DYN' (Dynamic Interchange) as a valid Energy Type for Interties |
| 9/23/2015 | 3.4 | Change Use Limit flag to Modifiable (previously non-modifiable) |
| 4/5/2016 | 3.5 | In GRDT: Added O&M Adder, Transition Midpoint MW, and Transition Midpoint Time; Removed Green House Gas Cost, MOO Flag, Stranded Load, Config Startup Heat Input, Transition Fuel, Transition Energy, and Max Transition Cost. |
| <u>10/09/2016</u> | <u>3.6</u> | <u>Added Fuel Source/Fuel Type enumeration of "GNRC" (to identify Generic NGRs)</u> |

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1 Introduction

1.1 Purpose

This document describes the Market Participant interface to CAISO's Master File Data Exchange Services. It provides the WSDL, XSD, and XML information required by application programmers to create and send messages and to process response messages.

1.2 Contact Information

Please email any questions regarding business content (business scenarios, data definitions, etc.) to RDT@caiso.com. Please email any questions regarding integrating applications with CAISO's Master File's web services, usage of the APIs, or API development to SOAIntegrationGroup@caiso.com

1.3 Release Notes for Master File Data Exchange Version 3.64

Release 3.64 simply ~~adds "GNRC" as a new Fuel Source/Fuel Type. (The attribute is referred to as "fuelSource" in the API and as "Fuel Type" in the RDT spreadsheet.) "GNRC" is the enumeration that will be used (along with the NGR flag) to identify "generic NGRs".~~ ~~changes the Use Limit flag to modifiable where it was non-modifiable in previous versions.~~ ~~Version 3.4 does not include any XSD, UI, or API changes.~~ ~~Previously if a Market Participant attempted to modify the Use Limit flag they would encounter error BRL199 with the message that this attribute is not modifiable.~~ ~~The only change to the GRDT is changing the color of the Use Limited header from grey (which indicates non-modifiable) to white/no color. This is a visual indicator only.~~

1.4 Location of .XSD and .WSDL files

The file names are listed in the Operational Details section of each service. All posted files can be found at the link below. The posted XSD represents the payload, all the supporting details including all the XSDs and WSDLs for each service are included in the posted zip file.

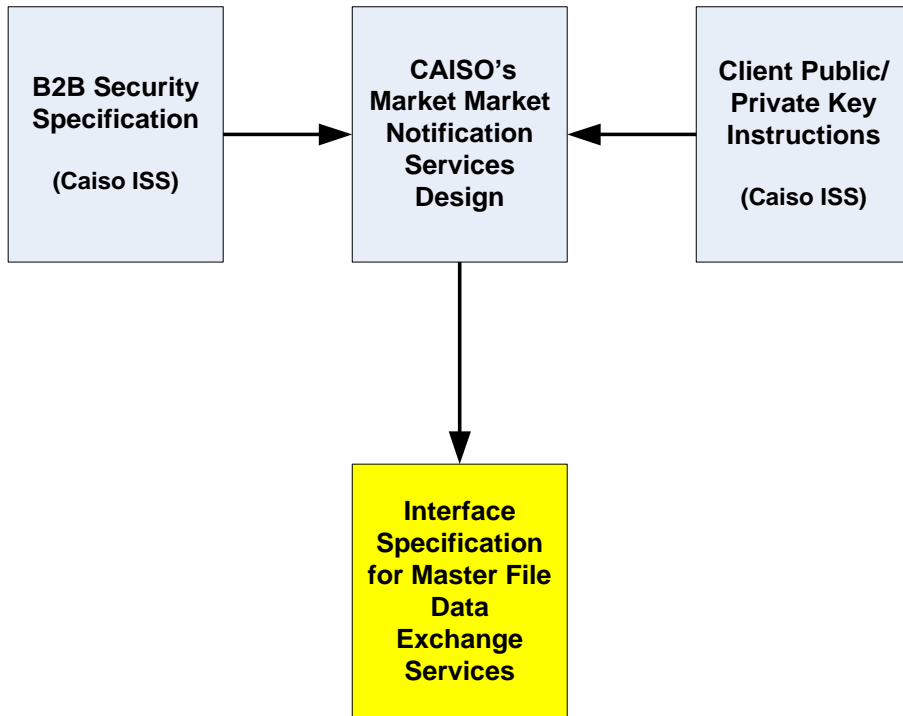
[Master File 20175 WinterFall Release](#)

1.5 Related Documents

CAISO has produced a set of documents describing its web services architecture and associated interfaces to the Bidding, Market Results, and Sandbox Services. *CAISO's Market Notification Services Design* is the top-level document in this set; Market Participants and their application programmers should read this document to gain an overall understanding of CAISO's web services architecture prior to reading any of the detailed documents shown below.

Please refer to the [Appendix 2 – Getting Access to Master File API](#) for access information.

Access to the Master File API follows the same standards as existing CAISO market services. Client Development should follow similar patterns.

**Figure 1 – Web Services Interface Specification Document Set**

The Web Services Interface Specification Document Set is available online at the locations indicated below.

| Doc. No. | Document Name | Location |
|----------|--|---|
| 1 | B2B Security Specification | https://portal.caiso.com (you must have access to SIBR or CMRI) |
| 2 | California ISO Market Notification Service Design | http://www.caiso.com/Documents/MarketNotificationServiceDesign.pdf |
| 4 | Interface Specification for Master File Data Exchange Services | http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx |

2 Services Overview

The Web Services provided to support the Master File Data Exchange are intended for external Market Participants usage.

2.1 External Market Participant Web Services

The external Market Participant Web Services for Master File Data Exchange are:

| Service | Schema | Use |
|--|---------------------|--|
| submitIntertieRDT_v1.wsdl submitIntertieRDT_v1_DocAttach.wsdl | IntertieRDT_v1.xsd | Allows the Market Participants to submit updates to Intertie resources. |
| retrieveIntertieRDT_v1.wsdl retrieveIntertieRDT_v1_DocAttach.wsdl | IntertieRDT_v1.xsd | Allows the Market Participants to retrieve 1 or all Intertie RDTs for a particular SC ID. |
| submitGeneratorRDT_v4.wsdl submitGeneratorRDT_v4_DocAttach.wsdl | GeneratorRDT_v4.xsd | Allows the Market Participants to submit updates to Generator Resources. |
| retrieveGeneratorRDT_v4.wsdl retrieveGeneratorRDT_v4.wsdl | GeneratorRDT_v4.xsd | Allows the Market Participants to retrieve 1 or all Generator RDTs for a particular SC ID. |

| | | |
|--------------------------------------|-----------------------------|--|
| retrieveRDTSubmissionStatus.wsdl | RDTSubmissionStatus.xsd | Allows the Market Participants to request the status of batch submissions of RDTs. |
| retrieveApprovedResourceChanges.wsdl | ApprovedResourceChanges.xsd | Allows the Market Participants to request a list of approved resources that are about to become effective based on a date range. |

2.2 Service Dependencies

There are dependencies between the submit services (IntertieRDT and GeneratorRDT) and the retrieveRDTSubmissionStatus. The consumer of the submit services should expect to wait for at least 30 minutes for the results of the submission to become available to the Submission Status service. The submission service submits a request to a work queue that ensures a short transaction time. When the system is ready, it picks up the submission request and processes it. Updating of the submission status may be delayed due to the size and number of submissions on the queue and the content of each submission.

The retrieve (IntertieRDT and GeneratorRDT) services are not directly related to the submit services since the retrieve service returns only approved resource information. The submission service initiates the data change request, but CAISO staff must approve the changed data before the changes can become effective. There will be a lag of up to 24 hours between the time the data change was approved and when it will be available to the Retrieve Service.

The Retrieve Approved Resource Changes service has business dependency on the submit services and the business approving their requests. Additionally there is a lag of up to 24 hours based on the time of approval until the information is available for a resource to show up on the Approved Resource Changes output.

3 Submit Intertie RDT

3.1 Business Scenario

Scheduling Coordinators submit Intertie RDT updates to modify particular data parameters of their existing resources in the Master File. While many Scheduling Coordinators submit their RDT updates via the UI manually, some Scheduling Coordinators will submit their RDT updates in batch mode through an automated process using this API. This service allows only updates to RDT (Resource) information. Other functionality, such as adding or deleting resources, is not currently available through this automated process.

3.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|--|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | The intertie batch payload average size is 2.5k and the max size is 4MB (basing it on 1500 resources) |
| Expected frequency (average and maximum) | Average of 2 and maximum of 200 updates per day |
| Longest time the service can be unavailable before business is impacted | One Day |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not complete submitting all their updates. They would have to wait longer for updates to be available. CAISO has a minimum 5 business day turn around time based on Tariff |
| Expected response time for the service | 60 Seconds |

3.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Submit messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a submitIntertieRDT service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes a request to Master File with Intertie RDT resource data by invoking the submit Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator prepares the Intertie RDT Update data set in XML format, which includes all data fields. Not providing a field indicates that, you want to remove the existing data.
- 2) Scheduling Coordinator validates the data set is compliant with the XML schema.
- 3) Scheduling Coordinator invokes the SubmitIntertieRDT Web Service directly to send a request to Master File with the Intertie RDT resource data set
- 4) Master File returns an acknowledgment message back to Scheduling Coordinator. This message contains the Batch Id when successful. If a structural or basic validation error occurs, the system will return a list of the errors in an XML formatted output.

There is one web service involved: **SubmitIntertieRDT_v1**

3.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|----------------------|---------------|----------------------------|-------------------------------------|---|
| SubmitIntertieRDT_v1 | Input | SubmitIntertieRDTRRequest | submitIntertieRDT_v1.wsdl | StandardAttachmentInfor.xsd IntertieRDT_v1.xsd |
| | Output | SubmitIntertieRDTRResponse | submitIntertieRDT_v1_DocAttach.wsdl | SubmitIntertieRDTStandardOutput.xsd |
| | Fault | FaultReturnTypes | | StandardOutput.xsd |

3.4.1 Operation Details – WSDL URLs

Production Environment – TBD

3.5 WSDLs

3.5.1 SubmitIntertieRDT_v1.wsdl – Used for normal SOAP messaging

3.5.2 SubmitIntertieRDT_v1_DocAttach.wsdl – Used when .Net is the source of processing

3.6 Standard Attachment Information

The attachment information schema, StandardAttachmentInfor.xsd, is used to provide general information for an SOAP attachment. The root element in the schema is *standardAttachmentInfor*, which can contain one or more attachment elements.

3.6.1 Element table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-------------|-----------------------------|---------------------------|-------|------------------------|--------|
| | | | | <i>//m:Attachment/</i> | |
| id | Globally unique identifier. | N/A | No | m:id | string |
| name | Attachment filename. | N/A | No | m:name | string |
| description | Description of attachment. | N/A | No | m:description | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-------------------------|--|---------------------------|-------|--|----------|
| version | Version ID of attachment file | N/A | No | m:version | string |
| Sequence Number | Sequence number if there are multiple attachments. | N/A | No | m:sequenceNumber | string |
| type | Attachment file type, such as zip or jpeg. | N/A | No | m:type | string |
| size | Size of attachment file. | N/A | No | m:size | string |
| source | Source of attachment file. | N/A | No | m:source | string |
| tool | Tool used to generate attachment. | N/A | No | m:tool | string |
| Creation Time | Time attachment file was created. | N/A | No | m:creationTime | dateTime |
| Compress Flag | Indicates whether or not attachment has been compressed (YES or NO). | N/A | No | m:compressFlag | string |
| Compress Method | Compress method used (if attachment file compressed). | N/A | No | m:compressMethod | string |
| | | | | //m:Attachment/m:AttributeList 0 – unbounded repeats | |
| Attribute List Sequence | Attribute list sequence number. | N/A | No | m:AttributeList/m:Sequence | string |
| Attribute List Name | Name of an attribute | N/A | No | m:AttributeList/m:Name | string |
| Attribute List Value | Value of an attribute | N/A | No | m:AttributeList/m:Value | string |

3.6.2 Schema

3.6.2.1 StandardAttachmentInfor.xsd

3.6.3 Example XML File (StandardAttachmentInforExample.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
Sample XML file generated by XMLSpy v2006 U (http://www.altova.com)
-->
<standardAttachmentInfor xmlns="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd">
  <Attachment>
    <id> 15798563</id>
    <name>GWED_11</name>
    <description>SUBMIT INTERTIE RDT</description>
    <version>1.1</version>
    <sequenceNumber>12</sequenceNumber>
    <type>ZIP</type>
    <size>180</size>
    <source>GWED</source>
    <tool>GZIP</tool>
    <creationTime>2006-12-17T09:30:47.0-08:00</creationTime>
    <compressFlag>yes</compressFlag>
    <compressMethod>ZIP</compressMethod>
    <AttributeList>
      <Sequence>2</Sequence>
      <Name>GWED</Name>
      <Value>1</Value>
    </AttributeList>
  </Attachment>
</standardAttachmentInfor>
```


3.7 Submit Intertie RDT Element Information

An Intertie RDT Update occurs when Scheduling Coordinator submits an XML file with a batch of RDT changes.

3.7.1 Element Table:

| Element | Data Description | RDT XLS Field [Column ¹] | Req'd | Modify | XPath | Type |
|------------------------|---|---|-------|--------|--|--|
| Message Header | | | | | //m:MessageHeader/ | |
| Time Date | The dateTime, in GMT, when the payload is published. | N/A | Yes | | m:TimeDate | dateTime See Appendix 1 |
| Source | The source of published data. The value for this payload is CAISO. | N/A | No | | m:Source | string |
| Message Payload | | | | | //m:MessagePayload/m:MasterFileRDTRecord/ | |
| Effective Date | The requested effective date of the Intertie RDT submission. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable) else a validation error will occur. | N/A | Yes | | m:RDTEffectiveDate | dateTime See Appendix 1 |

¹ Refer to Intertie RDT Format

| Element | Data Description | RDT XLS Field [Column ¹] | Req'd | Modify | XPath | Type |
|----------------------------|---|---|-------|--------|---|--------|
| Scheduling Coordinator | The Scheduling Coordinator Id is used as a key to associate resources to participants. The Scheduling Coordinator must have an active relationship with a resource in order to view or maintain it. | N/A | Yes | | m:SchedulingCoordinator | string |
| Comment ² | Comments submitted by the Scheduling Coordinator to alert CAISO staff about special conditions of the RDT Submission. | N/A | Yes | | m:Comment | string |
| Registered Intertie | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredInterTie/ | |
| Mrid | The ISO resource identifier used for tracking each resource for market scheduling. | RES_ID [A] | Yes | No | m:mrid | string |
| Must Offer Flag | An identifier of a resource that has a must offer obligation, either due to a RA obligation or through other obligation (i.e. future capacity market procurement, RCST, etc.). The acceptable values are 'YES' or 'NO'. | MOO_FLAG [I] | No | No | m:mustOfferFlag | string |

¹ Refer to Intertie RDT Format

| Element | Data Description | RDT XLS Field [Column ¹] | Req'd | Modify | XPath | Type |
|---------------------------------|--|---|-------|--------|--------------------------------|---------|
| Must Offer Obligation Qualified | Y - Resource is Must Offer N - Resource is not Must Offer R - Resource is eligible for Must Offer based on RA Capacity or RCST designation in any given trading hour | MOO_QUALIFIED [K] | No | No | m:mustOfferObligationQualified | string |
| Energy Product Type | Energy Type: FIRM - Firm Import/Export NFRM - Non Firm Import/Export WHL - Wheeling UCTG - Unit Contingent DYN – Dynamic Interchange | ENERGY_TYPE [B] | No | No | m:energyProductType | string |
| Min Hourly Block Limit | Represents the maximum number of consecutive Trading Hours that an Intertie resource can be bid in, if a Minimum Hourly Block is specified in the Bid. | MIN_HR_BLK_LIMIT [C] | No | Yes | m:minHourlyBlockLimit | integer |
| Wheeling Counter Party | Represents the wheeling counter resource that can be used in the Wheeling Bid Component of an Intertie resource bid. This ID is created in Master File and corresponds to the import wheel resource ID | WHEEL_REFERENCE_NUM [K] | No | No | m:WheelingCounterParty/m:mrid | string |

| Element | Data Description | RDT XLS Field [Column ¹] | Req'd | Modify | XPath | Type |
|-------------------------------|--|---|-------|--------|--|--------|
| GMC Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1 or 2 | GMC_RANK_LM PM [D] | No | Yes | m:GMCRankLMPM | string |
| Negotiated Rank LMPM | A method of calculating Default energy Bids based on a negotiation with the CAISO or the Independent Entity. Rank 1 or 2 | NEGO_RANK_L MMPM [E] | No | Yes | m:negotiateRankLMPM | string |
| Price Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1 | PRC_RANK_LM PM [F] | No | Yes | m:priceRankLMPM | string |
| Hourly Pre-Dispatch | Indicates need to dispatch before the start of the operating hour. Only relevent in Real-Time Market. | HR_PRE_DISP [G] | No | Yes | M:hourlyPredispatch | string |
| Certified RUC | An intertie resource that can participate in RUC market. The acceptable values are 'YES' or 'NO'. | CERT_RUC [H] | No | No | m:ResourceCertification/m:certifiedRUC | string |
| | | | | | | |
| Stranded Load | Represents an intertie resource that is subject to Isolated Tie / Stranded Load conditions | STRANDED_LO AD [L] | No | No | m:strandedLoad | string |
| Marginal Loss Cost Adjustment | Identifies whether or not the Intertie is eligible for MLCA (Marginal Loss Cost Adjustment). | MLCA [M] | No | No | m:MLCAFlag | string |

3.7.2 Schema

3.7.2.1 IntertieRDT_v1.xsd

3.7.3 Example XML File (IntertieRDTEExample.xml)

NOTE: This example shows updates to an Intertie RDT submitted by the SC ID

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<IntertieRDT xmlns="http://www.caiso.com/soa/2011-10-01/IntertieRDT_v1.xsd">
  <MessageHeader>
    <TimeDate>2011-10-01T00:00:00.000-07:00</TimeDate>
    <Source>MF</Source>
  </MessageHeader>
  <MessagePayload>
    <MasterFileRDTRecord>
      <RDTEffectiveDate>2011-10-01T00:00:00.000-08:00</RDTEffectiveDate>
      <SchedulingCoordinator>ABCD</SchedulingCoordinator>
      <Comment/>
      <RegisteredInterTie>
        <mrid>ABCD_M500_I_WHL_XXXX11</mrid>
        <mustOfferFlag>YES</mustOfferFlag>
        <mustOfferObligationQualified>R</mustOfferObligationQualified>
        <strandedLoad>YES</strandedLoad>
        <priceRankLMPM>1</priceRankLMPM>
        <negotiateRankLMPM>2</negotiateRankLMPM>
        <energyProductType>WHL</energyProductType>
        <minHourlyBlockLimit>24</minHourlyBlockLimit>
        <hourlyPredispatch>NO</hourlyPredispatch>
      </RegisteredInterTie>
    </MasterFileRDTRecord>
  </MessagePayload>
</IntertieRDT>
```

```

<WheelingCounterParty>
  <mrid>ABCD_MALIN500_XXXX11</mrid>
</WheelingCounterParty>
<ResourceCertification>
  <certifiedRUC>YES</certifiedRUC>
</ResourceCertification>
</RegisteredInterTie>
</MasterFileRDTRRecord>
</MessagePayload>
</IntertieRDT>

```

3.8 Submit Intertie RDT Response

3.8.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-------------------|--|---------------------------|-------|------------------------------|--------|
| Event Log | | | | //m:EventLog/ | |
| Event | | | | //m:EventLog/m:Event/ | |
| Event Result | The result of the submission. On success it will say "Records Received =XX, BatchId=XXXX". When there is a failure the result will say "Errors Encountered" | N/A | Yes | m:result | string |
| Id | On success, the batch id will be returned. On failure, the id will be -1. | N/A | Yes | m:id | string |
| Event Description | The description of the event | N/A | No | m:description | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|--|---|---------------------------|-------|------------------------------------|---|
| Creation Date Time | The creation date and time of the output | N/A | No | m:creationTime | dateTime See Appendix 1 |
| Service | | | | //m:EventLog/m:Service/ | |
| Id | The UUID generated unique service Id. It is different on every submission. | N/A | Yes | m:id | string |
| Name | The service name which is "SubmitIntertieRDT" | N/A | Yes | m:name | string |
| IntertieRDT Specific – Validation Errors – Repeat 0 → Unbounded numbers of IntertieRDTs | | | | //m:EventLog/m:IntertieRDT/ | |
| Resource Id | The resource id that there is a problem with. If it is not a resource related problem then this field element will be null. | N/A | No | m:resource_ID | string |
| Results | The problem description, for example "Not authorized to update this resource". It is possible that the error is not specific to a resource. An example of this is when the effective date is less than 5 business days from today. In that case, the Resource Id would not be filled in and the results would be. | N/A | No | m:results | string |

3.8.2 Schema

3.8.2.1 SubmitIntertieRDTStandardOutput.xsd

3.8.3 Example XML File (SubmitIntertieUpdateStandardOutputExample.xml)

```
<submitIntertieRDT
  xmlns="http://www.caiso.com/soa/2008-05-21/submitIntertieRDT">
  <outputDataType xmlns="http://www.caiso.com/soa/2008-05-21/SubmitIntertieRDTStandardOutput.xsd">
  <EventLog>
  <Event>
  <result>Records received=2, batchId=2962</result>
  <id>2962</id>
  <description>Intertie updates were successfully received.</description>
  <creationTime>2008-12-22T10:21:04.558-08:00</creationTime>
  </Event>
  <Service>
  <id>d00cf28b-a1bb-41aa-9abf-3031f420b4f0</id>
  <name>submitIntertieRDT</name>
  </Service>
  </EventLog>
  </outputDataType>
</submitIntertieRDT>
```

3.9 Fault Return

3.9.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-----------------------|--------------------------------|---------------------------|-------|---------------------------------------|----------|
| | | | | <i>//m:outputDataType/m:EventLog/</i> | |
| Id | Event log identifier. | N/A | No | m:id | string |
| Name | Event log name. | N/A | No | m:name | string |
| description | Event log description. | N/A | No | m:description | string |
| Type | Event log type. | N/A | No | m:type | string |
| creationTime | Event log creation time. | N/A | No | m:creationTime | date |
| Collection Type | Event log collection type. | N/A | No | m:collectionType | string |
| Collection Quantity | Event log collection quantity. | N/A | No | m:collectionQuantity | string |
| Event Result | Event result. | N/A | Yes | m:Event/m:result | string |
| Event. Id | Event identifier. | N/A | No | m:Event/m:id | string |
| Event Name | Event name. | N/A | No | m:Event/m:name | string |
| Event Description | Event description. | N/A | No | m:Event/m:description | string |
| Event Creation Time | Event creation time. | N/A | No | m:Event/m:creationTime | dateTime |
| Event Severity | Event severity. | N/A | No | m:Event/m:severity | string |
| Event Priority | Event priority. | N/A | No | m:Event/m:priority | string |
| Event Sequence Number | Event sequence number. | N/A | No | m:Event/m:sequenceNumber | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|---------------------|----------------------|---------------------------|-------|-------------------------|--------|
| Event Type | Event type. | N/A | No | m:Event/m:eventType | string |
| Service Id | Service identifier. | N/A | Yes | m:Service/m:id | string |
| Service Name | Service name. | N/A | Yes | m:Service/m:name | string |
| Service Description | Service description. | N/A | Yes | m:Service/m:description | string |
| Service Comments | Service comments. | N/A | Yes | m:Service/m:comments | string |

3.9.2 Schema

3.9.2.1 StandardOutput.xsd

3.9.3 Example XML File (StandardOutput.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
    <m:description>The Event Description</m:description>
    <m:type>Error Event</m:type>
    <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
    <m:collectionType>Submit Intertie Update</m:collectionType>
    <m:collectionQuantity>1</m:collectionQuantity>
  </m:Event>
</m:outputDataType>
</xml>
```

```
<m:result>Invalid Value Found in Field XX</m:result>
<m:id>1234</m:id>
<m:name>Error Event 1234</m:name>
<m:description>An invalid data value was presented</m:description>
<m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
<m:severity>High</m:severity>
<m:priority>High</m:priority>
<m:sequenceNumber>1</m:sequenceNumber>
<m:eventType>Initiated by MF API</m:eventType>
</m:Event>
<m:Service>
  <m:id>1234567</m:id>
  <m:name>Submit Intertie Update</m:name>
  <m:description>Having problems - Invalid data has been presented</m:description>
  <m:comments>Some one needs to fix the data and resubmit</m:comments>
</m:Service>
</m:EventLog>
</m:outputDataType>
```

4 Retrieve Intertie RDT Data

4.1 Business Scenario

Scheduling Coordinators retrieve Intertie RDT Data to view operational data parameters for their resources that reside in the Master File. While many Scheduling Coordinators Retrieve their RDT Data via the UI manually, some Scheduling Coordinators Retrieve their RDT Data in batch mode through an automated process using the API.

4.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|--|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | The intertie batch payload average size is 2.5k and the max size is 4MB (basing it on 1500 resources) |
| Expected frequency (average and maximum) | Average of 10 and maximum of 200 RDT Data retrievals per day. |
| Longest time the service can be unavailable before business is impacted | One Hour |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not be able to retrieve the latest values of their Data. They would not be able to confirm that the resources that are scheduled have the correct or latest data. This is a read only transaction. |
| Expected response time for the service | 60 Seconds |

4.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Retrieve messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a RetrieveIntertieRDTData service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes a request to Master File with Intertie RDT resource data by invoking the Retrieve Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator provides criteria to find one or more Intertie RDTs, the input criteria provided to the Master File is in XML format.
- 2) Scheduling Coordinator validates the data set based on the XML schema.
- 3) Scheduling Coordinator invokes the RetrieveIntertieRDT Web service directly to send a request to Master File with the Intertie RDT resource data set
- 4) Master File returns the requested payload of an Intertie resource message back to the Scheduling Coordinator.

There is one web service involved: **RetrieveIntertieRDT_v1**

4.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|------------------------|---------------|------------------------------|---------------------------------------|------------------------|
| retrieveIntertieRDT_v1 | Input | RetrieveIntertieRDTRRequest | retrieveIntertieRDT_v1.wsdl | RequestIntertieRDT.xsd |
| | Output | RetrieveIntertieRDTRResponse | retrieveIntertieRDT_v1_DocAttach.wsdl | IntertieRDT_v1.xsd |
| | Fault | FaultReturnTypes | | StandardOutput.xsd |

4.4.1 Operation Details – WSDL URLs

Production Environment - TBD

4.5 WSDL

4.5.1 RetrievalIntertieRDT_v1.wsdl - Used for normal SOAP messaging

4.5.2 RetrievalIntertieRDT_v1_DocAttach.wsdl - Used when .Net is the source of processing

4.6 Request Intertie RDT Information

The attachment information schema, *StandardAttachmentInfor.xsd*, is used to provide general information for an SOAP attachment. The root element in the schema is *standardAttachmentInfor*, which can contain one or more attachment elements.

4.6.1 Element table

| Element | Data Description | Req'd | XPath | Type |
|------------------------|---|-------|-----------------------|--|
| | | | //RequestIntertieRDT/ | |
| Trade Date | The point in time when the system is to search for resources of the specified SC ID. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). Data from the wrong date may be returned if time is not set to midnight. | Yes | tradeDate | dateTime See Appendix 1 |
| Scheduling Coordinator | The ID of the Scheduling Coordinator | Yes | schedulingCoordinator | string |
| Resource Type | Type of Intertie (ALL, ITIE or ETIE) | Yes | resourceType | string |
| Resource ID | Either ALL resources or one specific resource ID | Yes | resourceId | string |

4.6.2 Schema

4.6.2.1 RequestIntertie.xsd

4.6.3 Example XML File (RequestIntertieRDTEExample.xsd)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<RequestIntertieRDT xsi:schemaLocation="http://www.aiso.com/soa/2008-05-21/RequestIntertieRDT.xsd RequestIntertieRDT.xsd"
xmlns="http://www.aiso.com/soa/2008-05-21/RequestIntertieRDT.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <tradeDate> 2008-08-01T00:00:00.000-07:00</tradeDate>
  <schedulingCoordinator>ABCD</schedulingCoordinator>
  <resourceType>ALL</resourceType>
  <resourceID>ALL</resourceID>
</RequestIntertieRDT>
```

4.7 Retrieve Intertie RDT Data

Intertie RDT output from a Scheduling Coordinator's retrieve request.

```
<ns1814:ResourceCertification xmlns:ns1814="http://www.aiso.com/soa/2012-10-01/IntertieRDT_v20121001.xsd">
<ns1815:certifiedRUC xmlns:ns1815="http://www.aiso.com/soa/2012-10-01/IntertieRDT_v20121001.xsd">NO</ns1815:certifiedRUC>
</ns1814:ResourceCertification>
```

4.7.1 Element Table:

| Element | Data Description | RDT XLS Field [Column ³] | Req'd | XPath | Type |
|------------------------|---|---|---|-------------------------|--|
| Message Header | | | //m:MessageHeader/ | | |
| Time Date | The dateTime, in GMT, when the payload is published. | | Yes | m:TimeDate | dateTime See Appendix 1 |
| Source | The source of published data. The value for this payload is CAISO. | | No | m:Source | string |
| Message Payload | | | //m:MessagePayload/m:MasterFileRDTRRecord/ | | |
| Requested Trade Date | The trade date specified in the Intertie RDT retrieval request. The time component will be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | N/A | Yes | m:RDTEffectiveDate | dateTime See Appendix 1 |
| Scheduling Coordinator | The Scheduling Coordinator Id is used as a key to associate resources to participants. The Scheduling Coordinator must have an active relationship with a resource in order to view or maintain it. | N/A | Yes | m:SchedulingCoordinator | string |

³ Refer to Intertie RDT Format

| Element | Data Description | RDT XLS Field [Column ³] | Req'd | XPath | Type |
|---------------------------------|---|---|--|--------------------------------|--------|
| Comment | Comments submitted by the Scheduling Coordinator to alert CAISO staff about special conditions of the RDT Submission. | N/A | Yes | m:Comment | string |
| Registered Intertie | | | //m:MessagePayload/m:MasterFileRDTRRecord/m:RegisteredInterTie/ | | |
| Mrid | The ISO resource identifier used for tracking each resource for market scheduling. | RES_ID [A] | Yes | m:mrid | string |
| Must Offer Flag | An identifier of a resource that has a must offer obligation, either due to a RA obligation or through other obligation (i.e. future capacity market procurement, RCST, etc.). Acceptable values are 'YES' or 'NO'. | MOO [I] | No | m:mustOfferFlag | string |
| Must Offer Obligation Qualified | Y - Resource is Must Offer N - Resource is not Must Offer R - Resource is eligible for Must Offer based on RA Capacity or RCST designation in any given trading hour | MOO_QUALIFIED [J] | No | m:mustOfferObligationQualified | string |
| | | | | | |

| Element | Data Description | RDT XLS Field [Column ³] | Req'd | XPath | Type |
|----------------------------|--|---|-------|-------------------------------|---------|
| Energy Product Type | Energy Type: FIRM - Firm Import/Export NFRM - Non Firm Import/Export WHL - Wheeling UCTG - Unit Contingent DYN – Dynamic Interchange | ENERGY_TYPE [B] | No | m:energyProductType | string |
| Minimum Hourly Block Limit | Represents the maximum number of consecutive Trading Hours that an Intertie resource can be bid in, if a Minimum Hourly Block is specified in the Bid. | MIN_HR_BLK_LI M [C] | No | m:minHourlyBlockLimit | integer |
| Wheeling Counter Party | Represents the wheeling counter resource that can be used in the Wheeling Bid Component of an Intertie resource bid. This ID is created in Master File and corresponds to the import wheel resource ID | WHEEL_REFER ENCE_NUM [K] | No | m:WheelingCounterParty/m:mrid | string |
| GMC Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1 or 2 | GMC_RANK_LM PM [D] | No | m:GMCRankLMPM | string |
| Negotiated Rank LMPM | A method of calculating Default energy Bids based on a negotiation with the CAISO or the Independent Entity. Rank 1 or 2 | NEGO_RANK_L MPM [E] | No | m:negotiateRankLMPM | string |

| Element | Data Description | RDT XLS Field [Column ³] | Req'd | XPath | Type |
|-------------------------------|--|---|-------|--|--------|
| Price Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1 | PRC_RANK_LM PM [F] | No | m:priceRankLMPM | string |
| Hourly Pre-Dispatch | Indicates need to dispatch before the start of the operating hour. Only relevent in Real-Time Market. | HR_PRE_DISP [G] | No | m:hourlyPredispatch | string |
| Certified RUC | An intertie resource that can participate in RUC market. Acceptable values are 'YES' or 'NO'. | CERT_RUC [H] | No | m:ResourceCertification/m:certifiedRUC | string |
| | | | | | |
| Stranded Load | Represents an intertie resource that is subject to Isolated Tie / Stranded Load conditions | STRANDED_LO AD [L] | No | m:strandedLoad | string |
| Marginal Loss Cost Adjustment | Identifies whether or not the Intertie is eligible for MLCA (Marginal Loss Cost Adjustment). | MLCA [M] | No | m:MLCAFlag | string |

4.7.2 Schema

4.7.2.1 IntertieRDT_v1.xsd

4.7.3 Example XML File (IntertieRDTEExample.xml)

NOTE: in this example Intertie RDTs have been retrieved from a search by the Scheduling Coordinator

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<IntertieRDT xmlns="http://www.caiso.com/soa/2011-10-01/IntertieRDT_v1.xsd">
  <MessageHeader>
    <TimeDate>2011-10-01T00:00:00.000-07:00</TimeDate>
    <Source>MF</Source>
  </MessageHeader>
  <MessagePayload>
    <MasterFileRDTRRecord>
      <RDTEffectiveDate>2011-10-01T00:00:00.000-08:00</RDTEffectiveDate>
      <SchedulingCoordinator>ABCD</SchedulingCoordinator>
      <Comment/>
      <RegisteredInterTie>
        <mrid>ABCD_M500_I_WHL_XXXX11</mrid>
        <mustOfferFlag>YES</mustOfferFlag>
        <mustOfferObligationQualified>R</mustOfferObligationQualified>
        <priceRankLMPM>1</priceRankLMPM>
        <negotiateRankLMPM>2</negotiateRankLMPM>
        <energyProductType>WHL</energyProductType>
        <minHourlyBlockLimit>24</minHourlyBlockLimit>
        <hourlyPredispatch>NO</hourlyPredispatch>
        <WheelingCounterParty>
          <mrid>ABCD_MALIN500_XXXX11</mrid>
        </WheelingCounterParty>
        <strandedLoad>YES</strandedLoad>
      </RegisteredInterTie>
    </MasterFileRDTRRecord>
  </MessagePayload>
</IntertieRDT>
```

```

</WheelingCounterParty>
<ResourceCertification>
  <certifiedRUC>YES</certifiedRUC>
</ResourceCertification>
</RegisteredInterTie>
</MasterFileRDTRRecord>
</MessagePayload>
</IntertieRDT>

```

4.8 Retrieve Intertie RDT Data Response

4.8.1 Element Table

| Element | Data Description | Req'd | XPath | Type |
|------------------|-------------------|-------|------------------|--------------------------------------|
| | | | //ISOAttachment/ | |
| Attachment Value | Intertie RDT data | Yes | AttachmentValue | String of IntertieRDT data encrypted |

4.8.2 Schema

4.8.2.1 ISOAttachment.xsd

4.8.3 Example XML File (ISOAttachmentExample)

```

<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->

```

```

<ISOAttachment xsi:schemaLocation="http://www.caiso.com/soa/2006-10-26/ISOAttachment.xsd ISOAttachment.xsd"
xmlns="http://www.caiso.com/soa/2006-10-26/ISOAttachment.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <AttachmentValue>contents of the IntertieRDT.xsd goes here in UUE format</AttachmentValue>
</ISOAttachment>
  
```

4.9 Fault Return

4.9.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|--------------------|--------------------------------|---------------------------|-------|---------------------------------------|--------|
| | | | | <i>//m:outputDataType/m:EventLog/</i> | |
| Id | Event log identifier. | N/A | No | m:id | string |
| Name | Event log name. | N/A | No | m:name | string |
| description | Event log description. | N/A | No | m:description | string |
| Type | Event log type. | N/A | No | m:type | string |
| creationTime | Event log creation time. | N/A | No | m:creationTime | date |
| collectionType | Event log collection type. | N/A | No | m:collectionType | string |
| collectionQuantity | Event log collection quantity. | N/A | No | m:collectionQuantity | string |
| Event.result | Event result. | N/A | Yes | m:Event/m:result | string |
| Event.id | Event identifier. | N/A | No | m:Event/m:id | string |
| Event.name | Event name. | N/A | No | m:Event/m:name | string |
| Event.description | Event description. | N/A | No | m:Event/m:description | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|--------------------------|------------------------|---------------------------|-------|--------------------------|----------|
| Event.creationTime | Event creation time. | N/A | No | m:Event/m:creationTime | dateTime |
| Event.severity | Event severity. | N/A | No | m:Event/m:severity | string |
| Event.priority | Event priority. | N/A | No | m:Event/m:priority | string |
| Event.sequence Number | Event sequence number. | N/A | No | m:Event/m:sequenceNumber | string |
| Event.eventType | Event type. | N/A | No | m:Event/m:eventType | string |
| Service.id | Service identifier. | N/A | Yes | m:Service/m:id | string |
| Service.name | Service name. | N/A | Yes | m:Service/m:name | string |
| Service.description | Service description. | N/A | Yes | m:Service/m:description | string |
| Service.comments | Service comments. | N/A | Yes | m:Service/m:comments | string |

4.9.2 Schema

4.9.2.1 StandardOutput.xsd

4.9.3 Example XML File (StandardOutput.xml)

```

<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
  </m:EventLog>
</m:outputDataType>

```



```
<m:description>The Event Description</m:description>
<m:type>Error Event</m:type>
<m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
<m:collectionType>Retrieve Intertie RDT</m:collectionType>
<m:collectionQuantity>1</m:collectionQuantity>
<m:Event>
  <m:result>Invalid Value Found in Field XX</m:result>
  <m:id>1234</m:id>
  <m:name>Error Event 1234</m:name>
  <m:description>An invalid data value was found</m:description>
  <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
  <m:severity>High</m:severity>
  <m:priority>High</m:priority>
  <m:sequenceNumber>1</m:sequenceNumber>
  <m:eventType>Initiated by MF API</m:eventType>
</m:Event>
<m:Service>
  <m:id>1234567</m:id>
  <m:name>Retrieve Intertie RDT</m:name>
  <m:description>Having problems - Invalid data has been found</m:description>
  <m:comments>Some one needs to fix the data</m:comments>
</m:Service>
</m:EventLog>
</m:outputDataType>
```

5 Submit Generator RDT

5.1 Business Scenario

Scheduling Coordinators submit Generator RDT updates to modify particular data parameters of their existing resources in the Master File. While many Scheduling Coordinators submit their RDT updates via the UI manually, some Scheduling Coordinators submit their RDT updates in batch mode through an automated process using the API. This service allows only updates to RDT (Resource) information. If a resource is a MSG (Multi-Staged Generator), multiple configurations and transitions must be submitted with the Generator. If it is not a MSG resource, those components should not be included. Other functionality, such as adding or deleting resources, is not currently available through this automated process.

5.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|---|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | 6KB for one RDT, 1.2MB Max, 250 KB Average |
| Expected frequency (average and maximum) | 3/day average, 80/day maximum |
| Longest time the service can be unavailable before business is impacted | One Day |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not complete submitting all their updates. They would have to wait longer for updates to be available. CAISO has a minimum 5 business day turnaround time based on Tariff |
| Expected response time for the service | 60 Seconds |

5.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Submit messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a submitGeneratorRDT service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes request to Master File with Generator RDT resource data by invoking the submit Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator has the Generator RDT update data set ready in XML format, which includes all data fields. Not providing a field indicates that, you want to remove the existing data.
- 2) Scheduling Coordinator validates the data set based on the XML schema.
- 3) Scheduling Coordinator invokes the SubmitGeneratorRDT Web service directly to send a request to Master File with the Generator RDT resource data set
- 4) Master File returns an acknowledge message back to Scheduling Coordinator that the RDT updates have been submitted to the Master File system. Basic structural validation will be performed, if a problem is found the ISO Framework will return an output message in the format specified in the Output Message xsd.

There is one web service involved: **SubmitGeneratorRDT_v4**

5.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|-----------------------|---------------|----------------------------|--|--|
| SubmitGeneratorRDT_v4 | Input | SubmitGeneratorRDTRequest | submitGeneratorRDT_v4.wsdl SubmitGeneratorRDT_v4_DocAttach.wsdl | StandardAttachmentInfor.xsd GeneratorRDT_v4.xsd |
| | Output | SubmitGeneratorRDTResponse | | SubmitGeneratorRDTStandardOutput.xsd |

| | | | | |
|--|-------|------------------|--|--------------------|
| | Fault | FaultReturnTypes | | StandardOutput.xsd |
|--|-------|------------------|--|--------------------|

5.4.1 Operation Details – WSDL URLs

Production Environment - TBD

5.5 WSDL ([submitGeneratorRDT_v4.wsdl](#))

5.5.1 SubmitGeneratorRDT_v4.wsdl - Used for normal SOAP messaging

5.5.2 SubmitGeneratorRDT_v4_DocAttach.wsdl - Used when .Net is the source of processing

5.6 Standard Attachment Information

The attachment information schema, StandardAttachmentInfor.xsd, is used to provide general information for an SOAP attachment. The root element in the schema is *standardAttachmentInfor*, which can contain one or more attachment elements.

5.6.1 Element table

| Element | Data Description | Req'd | XPath | Type |
|-----------------|--|-------|---|--------|
| | | | //m:standardAttachmentInfor/m:Attachment/ | |
| Id | Globally unique identifier. | No | m:id | string |
| Name | Attachment filename. | No | m:name | string |
| Description | Description of attachment. | No | m:description | string |
| Version | Version ID of attachment file | No | m:version | string |
| Sequence Number | Sequence number if there are multiple attachments. | No | m:sequenceNumber | string |

| Element | Data Description | Req'd | XPath | Type |
|--------------------------|---|-------|----------------------------|----------|
| Type | Attachment file type, such as zip or jpeg. | No | m:type | string |
| Size | Size of attachment file. | No | m:size | string |
| Source | Source of attachment file. | No | m:source | string |
| Tool | Tool used to generate attachment. | No | m:tool | string |
| Creation Time | Time attachment file was created. | No | m:creationTime | dateTime |
| Compress Flag | Indicates whether attachment has been compressed (YES or NO). | No | m:compressFlag | string |
| Compress Method | Compress method used (if attachment file compressed). | No | m:compressMethod | string |
| Attribute List .Sequence | Attribute list sequence number. | No | m:AttributeList/m:Sequence | string |
| Attribute List. Name | Name of an attribute | No | m:AttributeList/m:Name | string |
| Attribute List .Value | Value of an attribute | No | m:AttributeList/m:Value | string |

5.6.2 Schema

5.6.2.1 StandardAttachmentInfor.xsd

5.6.3 Example XML File (StandardAttachmentInfor.xml)

```
<?xml version="1.0" encoding="UTF-8" ?>
<!--
Sample XML file generated by XMLSpy v2006 U (http://www.altova.com)
-->
<standardAttachmentInfor xmlns="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd">
```

```

<Attachment>
  <id> 15798563</id>
  <name>GWED_11</name>
  <description>SUBMIT GENERATOR RDT</description>
  <version>1.1</version>
  <sequenceNumber>12</sequenceNumber>
  <type>ZIP</type>
  <size>180</size>
  <source>GWED</source>
  <tool>GZIP</tool>
  <creationTime>2008-12-17T09:30:47.0-08:00</creationTime>
  <compressFlag>yes</compressFlag>
  <compressMethod>ZIP</compressMethod>
  <AttributeList>
    <Sequence>2</Sequence>
    <Name>GWED</Name>
    <Value>1</Value>
  </AttributeList>
</Attachment>
</standardAttachmentInfor>

```

5.7 Submit Generator RDT

A Generator RDT Update occurs when Scheduling Coordinator submit an XML file with a batch of RDT changes.

5.7.1 Element Table:

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------|------------------|---|-------|--------|-------|------|
|---------|------------------|---|-------|--------|-------|------|

⁴ Refer to the Generator RDT format

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------|---|---|-------|--------|--|--|
| Message Header | | | | | //m:MessageHeader/ | |
| Time Date | The dateTime, in GMT, when the payload is published. | N/A | Yes | | m:TimeDate | dateTime See Appendix 1 |
| Source | The source of published data. The value for this payload is CAISO. | N/A | Yes | | m:Source | string |
| Version | Date reflecting the release this latest version update was related to. | N/A | Yes | | m:Version | string |
| Message Payload | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/ | |
| Effective Date | The requested effective date of the Generator RDT submission. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable) else, a validation error will occur. | n/a | Yes | Yes | m:RDTEffectiveDate | dateTime See Appendix 1 |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-----------------------------|--|---|-------|--------|---|--------|
| Scheduling Coordinator | The Scheduling Coordinator Id is used as a key to associate resources to participants. The Scheduling Coordinator must have an active relationship with a resource in order to view or maintain it. An entity certified by the CAISO for the purposes of undertaking the functions specified in Section 4.5.3 of the CAISO Tariff. | SC_ID [B] | Yes | No | m:SchedulingCoordinator | string |
| Comment | Comments submitted by the Scheduling Coordinator to alert CAISO staff about special conditions of the RDT Submission. | n/a | No | Yes | m:Comment | string |
| Registered Generator | | | | | | |
| Resource Details | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/ | |
| Name | Descriptive name for the Resource. | RES_NAME [D] | No | No | m:name | string |
| Mrid | The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes. | RES_ID [C] | Yes | No | m:mrid | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------|--|---|-------|--------|----------------------|--------|
| Resource Type | Descriptive identifier denoting the type of resource: Generating Unit, Tie Generator, Load. The acceptable values are: GEN, LOAD, and TG | RES_TYPE [E] | Yes | No | m:resourceType | string |
| Minimum Off Time Value | The minimum amount of time that a Generating Unit must stay off-line after being shut down, due to physical operating constraints. Minimum Off Time includes Startup Time. | MIN_OFF [R] | No | Yes | m:minOffTime/m:value | float |
| Minimum Off Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minOffTime/m:units | string |
| Minimum On Time Value | The minimum amount of time that a Generating Unit must stay on-line after starting up and reaching PMin, prior to being shut down, due to physical operating constraints. | MIN_ON [P] | No | Yes | m:minOnTime/m:value | float |
| Minimum On Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minOnTime/m:units | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------|--|---|-------|--------|---------------------|--------|
| Maximum On Time Value | The maximum amount of time that a Generating Unit can stay on-line per day, due to environmental or physical operating constraints. If no constraint, then leave this field blank. | MAX_ON [Q] | No | Yes | m:maxOnTime/m:value | float |
| Maximum On Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maxOnTime/m:units | string |
| Dispatchable Flag | Designates a dispatchable resource. The acceptable values are 'YES' and 'NO' | DISP [BH] | No | No | m:dispatchFlag | string |
| | | | | | | |
| An Aggregate Resource? | An aggregation that consists of several individual "child" resources. The acceptable values are 'YES' and 'NO' | AGGREGATE_YN [F] | Yes | No | m:isAggregatedRes | string |
| LMPM Flag | An identifier of a resource that is subject to the market power mitigation process. Defined per tariff. The acceptable values are 'YES' and 'NO' | LMPM [AU] | No | No | m:LMPMFlag | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------------------|---|---|-------|--------|--------------------------------|--------|
| Must Offer Obligation Qualified | Y - Resource is Must Offer N - Resource is not Must Offer R - Resource is eligible for Must Offer based on RA Capacity or RCST designation in any given trading hour | MOO_QUALIFIED [AM] | No | No | m:mustOfferObligationQualified | string |
| Market Participant Flag | An identifier of the PGA Resources that participates in the market. The acceptable values are 'YES' and 'NO' | PGA_PART [AO] | No | No | m:marketParticipationFlag | string |
| | | | | | | |
| Price Set Flag for Day Ahead Market | Indicator of resource being able to set the price in DA market. The acceptable values are 'YES' and 'NO' | PRC_SET_DAM [BL] | No | No | m:priceSetFlagDA | string |
| Price Set Flag for Real Time Market | Indicator of resource being able to set the price in RT market. The acceptable values are 'YES' and 'NO' | PRC_SET_RTM [BM] | No | No | m:priceSetFlagRT | string |
| Maximum Operating MW Value | The maximum normal capability of the Generating Unit. | MAX_GEN [M] | No | Yes | m:maximumOperatingMW/m:value | float |
| Maximum Operating MW Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maximumOperatingMW/m:units | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|----------------------------|--|---|-------|--------|------------------------------|--------|
| Minimum Operating MW Value | For a Generating Unit, the minimum sustained operating level (Pmin or plant minimum) at which it can operate at a continuous level. | MIN_GEN [N] | No | Yes | m:minimumOperatingMW/m:value | float |
| Minimum Operating MW Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minimumOperatingMW/m:units | string |
| Raise Ramp Rate Value | Represents the fastest Best Operating Ramp Rate in the RAMP curve | MAX_RR [BK] | No | No | m:raiseRampRate/m:value | float |
| Raise Ramp Rate Units | This field is not used. The assumed unit of measure is MW/Min. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:raiseRampRate/m:units | string |
| Unit Type | Description of prime mover technology associated with the Generating Unit; such as, Hydro Turbine, Gas Turbine, Combined Cycle, etc. The acceptable values are: "CCYC", "GTUR", "HYDR", "OTHR", "PHOT", "PTUR", "RECP", "STUR", "SYNC", "WIND", "PUMP" | GEN_TECH_TY PE [I] | No | No | m:unitType | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-----------------------------|---|---|-------|--------|---------------------------|--------|
| Generator Type | 'H' - Hydro resources 'T' - All other resources | GEN_TYPE [J] | | No | m:genType | string |
| RMR Flag | Designates a resource that has a Reliability Must Run contract. The acceptable values are 'YES' and 'NO' | RMR [BJ] | No | No | m:RMRFlag | string |
| Use Limit | Identifier if a resource is energy use limited, such as limitation of energy or emission control, etc. The acceptable values are 'YES' and 'NO' | USE_LIMIT [BD] | No | Yes | m:useLimitFlag | string |
| Minimum Load Cost Value | The costs a Generating Unit or a Participating Load incurs operating at minimum load. The value is needed for a resource with the Cost Basis of Registered Cost (fixed value) only. | MIN_LOAD_COST [T] | No | Yes | m:minLoadCost/m:value | float |
| Minimum Load Cost Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minLoadCost/m:units | string |
| Maximum Pumping Level Value | The Maximum Operating Level of a Pump or a Pumped-Storage Hydro Unit operating as a hydro pump. | MAX_PUMP [W] | No | Yes | m:maxPumpingLevel/m:value | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|----------------------------------|---|---|-------|--------|------------------------------------|--------|
| Maximum Pumping Level Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maxPumpingLevel/m:units | string |
| Operating Maintenance Cost Value | Variable operations and maintenance costs, a component of the Variable Cost option for calculating the Default Energy Bid. | OPER_MAINT_COST [BE] | No | No | m:operatingMaintenanceCost/m:value | float |
| Operating Maintenance Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:operatingMaintenanceCost/m:units | string |
| MLCost Basis | Cost option (proxy or registered) for a generating resource's Minimum Load cost. | ML_COST_BASIS_TYPE [U] | No | Yes | m:MLCostBasis | string |
| SUCost Basis | Cost option (proxy or registered) for a generating Resource's Startup Cost. | SU_COST_BASIS_TYPE [V] | No | Yes | m:SUCostBasis | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------------|--|---|-------|--------|-------------------------|---------|
| Fuel Source | Description of primary fuel type; such as, Natural Gas, Oil, Nuclear, etc. The acceptable values are: "BGAS", "BIOM", "COAL", "DIST", "GAS", "GEOT", "HRCV", "NONE", "NUCL", "OIL", "OTHR", "SOLR", "WAST", "WATR", "WIND", "LESR", "DDR", <u>"GNRC"</u> | FUEL_TYPE [H] | No | No | m:fuelSource | string |
| Constrained Output Flag | The output of the generation resources is not variable, i.e. PMax = PMin. Y: output is constrained. The acceptable values are 'YES' and 'NO' | COG [AP] | No | No | m:constrainedOutputFlag | string |
| Maximum Startups Per Day | The maximum number of times a Generating Unit can be started up within one day, due to environmental or physical operating constraints. | MAX_STRT [S] | No | Yes | m:maxStartUpsPerDay | integer |
| Pumping Cost Value | The minimum pumping cost | MIN_PUMP_CST [X] | No | Yes | m:pumpingCost/m:value | float |
| Pumping Cost Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpingCost/m:units | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------------|--|---|-------|--------|---------------------------|--------|
| Pumping Factor | Pumping factor of a pumping resource | PUMPING_FACTOR [Y] | No | Yes | m:pumpingFactor | float |
| Qualifying Facility Owner | Identifier if a resource is a qualifying cogeneration facility or small qualifying power production facility, as defined in the Code of Federal Regulations, Title 18, Part 292 | QF [BC] | No | No | m:qualifyingFacilityOwner | string |
| Pump Minimum Up Time Value | Minimum pumping run time | PUMP_MIN_UP_TM [AA] | No | Yes | m:pumpMinUpTime/m:value | float |
| Pump Minimum Up Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpMinUpTime/m:units | string |
| Pump Minimum Down Time Value | The minimum amount of time that a pumping resource must stay off-line after shutting down. | PUMP_MIN_DWN_TM [AB] | No | Yes | m:pumpMinDownTime/m:value | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------------|--|---|-------|--------|---------------------------|--------|
| Pump Minimum Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpMinDownTime/m:units | string |
| Cost Rank LMPM | A method of calculating Default energy Bids based on fuel costs and variable operations and maintenance costs. Acceptable values for Rank 1, 2, or 3 | COST_RANK_LM PM [AG] | No | Yes | m:costRankLMPM | string |
| Price Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1, 2, or 3 | PRC_RANK_LMP M [AI] | No | Yes | m:priceRankLMPM | string |
| Negotiated Rank LMPM | A method of calculating Default energy Bids based on a negotiation with the CAISO or the Independent Entity. Rank 1, 2, or 3 | NEGO_RANK_LM PM [AH] | No | Yes | m:negotiateRankLMPM | string |
| Load Following Up MSS | Identifier if a resource is load following up. The acceptable values are 'YES' or 'NO'. | MSS_LD_FLNG_ UP [BB] | No | No | m:loadFollowingUpMSS | string |
| Load Following Down MSS | Identifier if a resource is load following down. The acceptable values are 'YES' or 'NO'. | MSS_LD_FLNG_ DWN [BA] | No | No | m:loadFollowingDownMSS | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------------|--|---|-------|--------|-------------------------|---------|
| Gen-to-Pump Minimum Down Time | The Gen-to-Pump minimum down time. Applies to Pump Storage Resource: Minimum time (in minutes) that resource must be offline (or self-scheduled) after being de-committed by Market system from generation operation and before being dispatched in pumping mode. | MIN_DWN_TM_G P [AC] | No | Yes | m: genToPumpMinDownTime | integer |
| Pump-to-Gen Minimum Down Time | The Pump-to-Gen minimum down time. Applies to Pump Storage Resources: Minimum time (in minutes) that resource must be offline (or self-scheduled) after being de-committed from pumping operation and before being dispatched in generation mode. | MIN_DWN_TM_P G [AD] | No | Yes | m: pumpToGenMinDownTime | integer |
| Pump Shutdown Time | The pump shutdown time | PUMP_SHTDWN _TM [AF] | No | Yes | m:pumpShutdownTime | integer |
| Pump Shutdown Cost | The maximum pump shutdown cost | MAX_PUMP_SD_ CST [AE] | No | Yes | m:pumpShutdownCost | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|---|-------|--------|-----------------------|--------|
| TG Energy Product Type | Energy Type: 'DYN' - Dynamic Resource (only if RES_TYPE='TG') 'FIRM' – is valid too | ENERGY_TYPE [G] | No | No | m:TGEnergyProductType | string |
| Air Quality Management District | The Air Quality Management District or Air Pollution Control District in which the resource is located. | AQM_DIST_TYPE [L] | No | No | m:AQMDistrict | string |
| Participating Generator Agreement Name | The name of an agreement between the CAISO and a Participating Generator; a pro forma version of which is set forth in Appendix B.2 of the CAISO Tariff. | PGA_NAME [A] | No | No | m:PGAName | string |
| Priority Type | MT - Regulatory Must Take resources REGM - Regulatory Must-Run RMR - Reliability Must Run PIRP - Participate in PIRP program This field will no longer be used as of Trade Date 7/1/2010. | PRIOR_TYPE [BG] | No | No | m:priorityType | string |
| Startup Code Type | Code used to determine the startup characteristics. FAST: Generating Units that have a Start Up Time of ten minutes or less and can provide non-spin. Blank: All other resources. | STARTUP_CD_T YPE [AN] | No | No | m:startUpCodeType | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------------|---|---|-------|--------|---|---------|
| Minimum Dispatch Level Value | The minimum operating level at which a Generating Unit is able to readily respond to a dispatch instruction. | MIN_DISP_LEVEL [O] | No | Yes | m:MinDispatchLevel/m:value | float |
| Minimum Dispatch Level Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:MinDispatchLevel /m:units | string |
| Pump Shutdown Time | The maximum pump start ups per day | PUMP_MAX_STARTUPS [Z] | No | Yes | m:pumpMaxStartUps | integer |
| Spin Capacity Value | The portion of unloaded synchronized generating capacity that is immediately responsive to system frequency and that is capable of being loaded in ten minutes, and that is capable of running for at least two hours. | RSRV_CAP_SPIN [AJ] | Yes | Yes | m:ResourceCapacity[m:capacityType='SR']/m:defaultCapacity/m:value | float |
| Spin Capacity Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:ResourceCapacity[m:capacityType='SR']/m:defaultCapacity/m:units | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|---|--------|
| Spin Capacity Type | Capacity Type must be set to 'SR'. | n/a | No | n/a | m:ResourceCapacity/m:capacityType='SR' | string |
| Non-Spin Capacity Value | The portion of off-line generating capacity that is capable of being synchronized and Ramping to a specified load in ten minutes (or load that is capable of being interrupted in ten minutes) and that is capable of running (or being interrupted.) | RSRV_CAP_NSPI N [AK] | Yes | Yes | m:ResourceCapacity[m:capacityType='NR']/m:defaultCapacity/m:value | float |
| Non-Spin Capacity Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:ResourceCapacity[m:capacityType='NR']/m:defaultCapacity/m:units | string |
| Non-Spin Capacity Type | Capacity Type must be set to 'NR' | n/a | No | n/a | m:ResourceCapacity/m:capacityType='NR' | string |
| | | | | | | |
| | | | | | | |
| Certified Nonspin DAM | An identifier of a resource that is certified to provide Non-Spinning Reserve in the DAM. The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_DAM M [AY] | No | Yes | m:ResourceCertification/m:certifiedNonspinDAM | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------------------|--|---|-------|--------|---|--------|
| Certified Nonspin RTM | An identifier of a resource that is certified to provide Non-Spinning Reserve in the RTM. To be procured in the RTM, a unit must also have a Startup Code Type of FAST. The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_RT M [AZ] | No | Yes | m:ResourceCertification/m:certifiedNonspinRTM | string |
| Certified PIRP | PIRP program identifier. Valid values are: 'YES' – is eligible for Settlements treatment as a PIRP participant. 'NO' – not a PIRP participant. 'M' – meterological data will be collected in the PIRP program. 'Q' – meterological data will be collected in the PIRP program and is subject to the 701 Settlement Forecast Fee. | CERT_PIRP [AL] | No | No | m:ResourceCertification/m:certifiedPIRP | string |
| Certified Regulation Down | An identifier of a resource that is certified to provide Regulation Down Reserve. The acceptable values are 'YES' or 'NO'. | CERT_REG_DOWN [AV] | No | Yes | m:ResourceCertification/m:certifiedRegulationDown | string |
| Certified Regulation Up | An identifier of a resource that is certified to provide Regulation Up Reserve. The acceptable values are 'YES' or 'NO'. | CERT_REG_UP [AW] | No | Yes | m:ResourceCertification/m:certifiedRegulationUp | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-----------------------------|---|---|-------|--------|---|--------|
| Certified Spin | An identifier of a resource that is certified to provide Spinning Reserve.. The acceptable values are 'YES' or 'NO'. | CERT_SPIN [AX] | No | Yes | m:ResourceCertification/m:certifiedSpin | string |
| Certified RUC | A resource that can participate in RUC market. Currently all PGA resources can participate in the RUC market. The acceptable values are 'YES' or 'NO'. | CERT_RUC [AT] | No | No | m:ResourceCertification/m:certifiedRUC | string |
| Fuel Region Type | The area of the state where the Generator lies - used for Gas-fired and Coal Generators. | FUEL_REGN_TY PE [K] | No | No | m:FuelRegion/m:fuelRegionType | string |
| MSG Resource Flag | Indicator of a resource that is modeled with multiple configurations under the Multi-Stage Generator (MSG) model. The acceptable values are 'YES' or 'NO'. | MSG_YN [BN] | No | No | | string |
| Startup Ramp Time | Represents the time in minutes it takes to physically ramp from off-line to pmin. Even though it is modeled as a float, values will be rounded by normal rounding rules to an integer value. | STARTUP_RAMP _TIME [BO] | No | No | | float |
| Supplied Configuration Flag | Placeholder for future functionality. This flag will indicate whether the online configuration ID for the MSG resource will be provided to the ISO in real-time. If "NO", ISO systems will derive the configuration ID based on telemetry or state estimator solution. The acceptable values are 'YES' or 'NO'. | SUPPLIED_CONF IG_YN [BP] | No | No | | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------------------------|---|---|-------|--------|---|--------|
| Hourly Predispatch Flag | Indicates need to dispatch before the start of the operating hour. Only relevant in Real-Time Market. | HR_PRE_DISP [BQ] | No | Yes | m:hourlyPredispatch | string |
| CertifiedBlackStart | BlackStartCertification: Y: Certified for Black Start; N: Not Certified for Black Start; Will be null for non-Generators | CERT_BLKSTRT [AQ] | No | No | m:ResourceCertification/m:certifiedBlackStart | string |
| Certified DAM | Certified for Day-Ahead Market | CERT_DAM [AR] | No | No | m:ResourceCertification/m:certifiedDAM | string |
| Certified RTM | Certified for Real-Time Market | CERT_RTM [AS] | No | No | m:ResourceCertification/m:certifiedRTM | string |
| NGR | Indicates a non-generator resource that can operate as either Gen or Load. The acceptable values are 'YES' or 'NO'. | NGR [BR] | No | No | m:NGResourceFlag | String |
| REM | Indicates an NGR resource electing Regulation Energy Management (REM) and can only provide Regulation service. The acceptable values are 'YES' or 'NO'. | REM [BS] | No | Yes | m:REMFlag | string |
| Minimum Continuous Energy Limit | The minimum energy (MWh) that the LESR device can store. | MIN_CONT_ENERGY_LIMIT [BT] | No | Yes | m:minContinuousEnergyLimit | float |
| Maximum Continuous Energy Limit | The maximum energy (MWh) that the LESR device can store. | MAX_CONT_ENERGY_LIMIT [BU] | No | Yes | m:maxContinuousEnergyLimit | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|----------------------------------|--|---|-------|--------|--|--------|
| Curtailment Energy Limit | The maximum reduction of energy consumption (MWh) that the DDR device can incur. | CURT_ENERGY_LIMIT [BV] | No | Yes | m:curtailmentEnergyLimit | float |
| Energy Efficiency | Percent of charging energy that the device can discharge. | ENERGY_EFFIC [BW] | No | Yes | m:energyEfficiency | float |
| Combined Heat and Power Resource | Identifies resource that has been approved as Combined Heat and Power resource (producing electric energy and forms of useful thermal energy). | CHP [BX] | No | No | m:CHPResourceFlag | String |
| RMT Max On Peak | RMTG <i>On Peak</i> capacity value | RMT_MAX_ON_P EAK [BY] | No | No | /RegulatoryMustTakeGeneration/RMT GCapacity/value where /RegulatoryMustTakeGeneration/RMT GCapacityType='RMTMaxOnPeak' | Float |
| RMT On Peak Expiration Date | Due date by when RMTG <i>On Peak</i> capacity value must be renewed. | RMT_MAX_ON_P EAK_EXP_DT [BZ] | No | No | /RegulatoryMustTakeGeneration/RMT GCapacity/RMTGCapacityExpDate where /RegulatoryMustTakeGeneration/RMT GCapacityType='RMTMaxOnPeak' | Date |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------------------------------|--|---|-------|--------|---|--------|
| RMT Max Off Peak | RMTG <i>Off Peak</i> capacity value | RMT_MAX_OFF_ PEAK [CA] | No | No | /RegulatoryMustTakeGeneration/RMT GCapacity/value where /RegulatoryMustTakeGeneration/RMT GCapacityType='RMTMaxOffPeak' | Float |
| RMT Off Peak Expiration Date | Due date by when RMTG <i>Off Peak</i> capacity value must be renewed. | RMT_MAX_OFF_ PEAK_EXP_DT [CB] | No | No | /RegulatoryMustTakeGeneration/RMT GCapacity/RMTGCapacityExpDate where /RegulatoryMustTakeGeneration/RMT GCapacityType='RMTMaxOffPeak' | Date |
| Emission Rate | Factor was used by CARB to determine resource's obligation for compliance with CA Greenhouse Gas Emission Cap-and-Trade program. | EMISSION_RATE [CC] | No | Yes | m:GHGEmissionFactor | Float |
| Green House Gas Compliance Obligation | Identifies a resource that has obligation to comply with CA Greenhouse Gas Emission Cap-and-Trade program. | GHG_COMPLIAN CE_OBLIG [CD] | No | Yes | m:GHGComplianceObligFlag | string |
| Min Load Major Maintenance Adder | This is a fixed adder which modifies the proxy minimum load in order to account for major maintenance expenses. | ADDER_AMT [CE] | No | No | m:minLoadMMA | Float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|---|---|-------|--------|--|--------|
| Variable Energy Resource Flag | Variable Energy Resource (VER) identification flag; Y: It is a VER; N: It is not a VER. If no data, it is assumed to not be a VER | VER [CF] | No | Yes | m:VERFlag | string |
| Forecast Selection | Variable energy resource forecast selection | FORECAST_SELECTION [CG] | No | Yes | m:ForecastSelection | string |
| Energy Imbalance Market Participating Flag | Energy Imbalance Market (EIM) participation flag. Identifies if the resource is participating in the EIM. | EIM_PARTICIPATING [CH] | No | No | m:EIMParticipationFlag | string |
| Balancing Authority Area | The Balancing Authority Area to which the resource belongs. | BAA [CI] | No | No | m:HostControlArea/m:mrid | string |
| O&M Adder Type | Identifies the type of Operating Maintenance Cost. Valid Types are D (Default) and N (Negotiated). | OPER_MAINT_ADDER_TYPE [BF] | No | No | m:operatingMaintenanceCostType | string |
| Regulation Segments (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:RegulatingLimit/ | |
| High Limit Value | Higher level of the Regulation Range. | Higher MW for Regulation [E] | No | Yes | m:highLimit/m:value | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|--|---------|
| High Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:highLimit/m:units | string |
| Low Limit Value | Lower level of the Regulation Range. | Lower MW for Regulation [D] | No | Yes | m:lowLimit/m:value | float |
| Low Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:lowLimit/m:units | string |
| Segment Number | Number of the regulation range. Up to two segments allowed. If two are submitted, then segment number 1 must describe the lower range and segment number 2 must describe the upper range. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| <u>Forbidden</u> Region Segments (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:ForbiddenRegion/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------|---|---|-------|--------|-------------|---------|
| Crossing Time | The time a generator needs to move through the Forbidden Region. | Forbidden Region Crossing Time [F] | No | Yes | m:crossTime | integer |
| High MW | The upper MW output of the forbidden region of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: Forbidden regions cannot include nor overlap regulation ranges or heat segments. | Upper MW of Forbidden Region [E] | No | Yes | m:highMW | float |
| Low MW | The lower MW output of the forbidden range of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: forbidden regions cannot include nor overlap regulation ranges or heat segments. | Lower MW of Forbidden Region [D] | No | Yes | m:lowMW | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------------------|--|---|-------|--------|--|---------|
| Segment Number | This number represents a given forbidden region. Segment number 1 should be the forbidden region at the lowest level in the operating range. Segment numbers should correspond to sequential regions along the operating range, ending with segment (n) at the highest operating level. Up to four (4) segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Ramp Rates (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:RampRateCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Ramp MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|---|--------|
| Ramp Min Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Ramp Max Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |
| Ramp Rate Type | The legitimate values are as follows: OP – Operational Ramp Rate REG – Regulation Ramp Rate OP_RES – Operating Reserve Ramp Rate | Based on the sheet name OP =RAMPRATE Sheet REG =REGRAMP Sheet OP_RES =OP RES RAMP Sheet | Yes | Yes | m:rampRateType | string |
| Individual Ramp Rate Data (0 to unbounded) Substitute Ramp Rate Type for 'XX' to retrieve values by type | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:RampRateCurve[m:rampRateType='XX'] /m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|----------------------|--|---|-------|--------|--------------|-------|
| Ramp MW Output Value | The Generating Unit MW output of point i. The first point (1) of MW output must begin at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMax. This field only applies to ramp rate type "OP". Other types ("REG" and "OP_RES") should not include this field. | Operating Level [D] | No | Yes | m:xAxisData | float |
| Ramp Min Rate Value | The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1). The minimum ramp rate of the last point should = the previous one. This requires providing the minimum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Worst Operational Ramp Rate [E] | No | Yes | m:y1AxisData | float |
| Ramp Max Rate Value | The maximum ramp rate under the best operating condition of the Generating Unit between point (i) and the point (i+1). The maximum ramp rate of the last point should = the previous one. This requires providing the maximum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Best Operational Ramp Rate [F] | No | Yes | m:y2AxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|---------|
| Segment Number | Point numbers between the PMin and PMax of the Generating Unit output. The point numbering starts at 1. Up to 5 points allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Heat Rate – Heat Rate Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:HeatRateCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Heat Heat Rate Units | This field is not used. The assumed unit of measure is BTU/KW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|---|--------|
| Heat Emission Rate Units | This field is not used. The assumed unit of measure is lbs of NOx/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |
| Heat Rate Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:HeatRateCurve/m:CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------------|---|---|-------|--------|--------------|-------|
| Heat – Heat Rate Value | For gas-fired units only, the average heat rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If not a gas-fired unit, leave blank and <u>instead</u> complete the Average Heat Cost field. | Heat Rate [E] | No | Yes | m:y1AxisData | float |
| Heat Emission Rate Value | The emission rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). | Heat Emission Rate [F] | No | Yes | m:y2AxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|--|---------|
| Segment Number | <p>The point numbers between the PMin and PMax of the Generating Unit output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p> <p>Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Heat - Fuel Cost Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:FuelCostCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|---|--------|
| Average Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Fuel Cost Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:FuelCostCurve/m:CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|---|-------|--------|---|---------|
| Average Cost Value | Use this value for non-gas fired units instead of Heat Rate. The average cost of the Generating Unit on point (i) in \$. If value at point (i) is not available, linear interpolation can be used to approximate the value. Average cost must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If gas-fired, make sure to enter a value in Heat Rate and leave this field blank. | Average Cost [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Time (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:StartupTimeCurve/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Time data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:StartUpTimeCurve/m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-------------|-------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. Downtime must be set to the same value for each element of a segment (Time, Fuel, Aux, and Energy) to ensure consistent startup data content. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|---|---------|
| Startup Time Value | Startup Time is the time (in whole minutes) it takes a resource to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the Generating Unit (in minutes) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup time (in minutes) from cooling time (n) to infinity. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. | Start-Up Time [E] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Energy (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:StartUpEnergyCurve/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is MW/Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Energy data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:StartUpEnergyCurve/m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Energy Value | The electrical power used by a Generating Unit during startup. The Generating Unit's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinite. | Start-Up Aux [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| Startup – Fuel (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerato r/m:StartUpFuelCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Fuel Value Units | This field is not used. The assumed unit of measure is Million BTU. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Fuel data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerato r/m:StartUpFuelCurve/m:CurveSch eduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Fuel Value | The fuel use (in mBTU per start) expected for the startup of a natural gas fired Generating Unit that has been off-line for a substantial period of time. The startup fuel of the Generating Unit (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinite. | Start-Up Fuel [H] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|---|--------|
| Startup – Cost (0 to unbounded) | | | | | <code>//m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:StartUpCostCurves/</code> | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Cost data (0 to unbounded) | | | | | <code>//m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:StartUpCostCurves/m:CurveScheduleDatas/</code> | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Cost Value | The startup cost of non-natural gas fired Generating Units (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. | Start-Up Cost [F] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| Startup Major Maintenance Adder | The Major Maintenance Adder (MMA) provides for the definition of a cost adder curve used as an overlay to the initial StartUpCostCurve to account for major maintenance expenses | Start-Up MMA [I] | No | No | m:AdderCurve | float |
| MSG Configurations – configurations (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:Configuration/ | |
| Configuration Name | Describes the configuration from a human readable point of view | On MSG_CONFIG Sheet – CONFIG_NAME [C] | No | Yes | m:name | string |
| Configuration ID | Must be unique within the MSG Resource | CONFIG_ID [B] | Yes | No | m:mrid | string |
| Startup Code Type | Represents the startup speed of a configuration. FAST : configuration that can startup within ten minutes. Leave blank for all other configurations. | STARTUP_CD _TYPE [N] | No | Yes | m:LogicalGenerator/startUpCodeType | string |
| | | | | | | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------|---|---|-------|--------|---|--------|
| Maximum Generation | Maximum generation for this configuration. This value must be < = to Maximum Generation of its parent resource. | MAX_GEN [D] | Yes | Yes | m:LogicalGenerator/m:maximumOperatingMW/m:value | float |
| Minimum Generation | Minimum generation for this configuration. This value must > = to the minimum generation of its parent resource. | MIN_GEN [E] | Yes | Yes | m:LogicalGenerator/m:minimumOperatingMW/m:value | float |
| Minimum Load Cost | Minimum load cost for this configuration. | MIN_LOAD_COST [H] | No | Yes | m:LogicalGenerator/m:minLoadCost/m:value | float |
| Minimum Off Time | Minimum off time for this configuration, this is when its down what's the minimum time before you can restart | MIN_OFF [G] | No | Yes | m:LogicalGenerator/m:minOffTime/m:value | float |
| Minimum On Time | Minimum on time that a configuration once started must run for. | MIN_ON [F] | No | Yes | m:LogicalGenerator/m:minOnTime/m:value | float |
| Startup Ramp Time | Startup Ramp Time | STARTUP_RAMP_TIME [M] | No | No | m:LogicalGenerator/m:StartUpRampTime | float |
| Startup Flag | Whether Combined Cycle Plant can be started in this Logical Configuration. The acceptable values are 'YES' or 'NO'. | STARTUP_YN [K] | Yes | Yes | m:LogicalGenerator/m:startUpFlag | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| Shutdown Flag | Can you shutdown from this configuration? The acceptable values are 'YES' or 'NO'. | SHUTDOWN_ YN [L] | No | Yes | m:LogicalGenerator/m:shutDownFlag | string |
| Reserve Capacity Non-Spinning | The amount of reserve capacity available in non-spinning mode. | RSRV_CAP_N SPIN [J] | No | Yes | m:LogicalGenerator/m:ResourceCapacity[m:capacityType='NR']/m:defaultCapacity/m:value | float |
| Reserve Capacity Spinning | The amount of reserve capacity available in spinning mode | RSRV_CAP_S PIN [I] | No | Yes | m:LogicalGenerator/m:ResourceCapacity[m:capacityType='SR']/m:defaultCapacity/m:value | float |
| Certified for Non Spin DAM (Day Ahead Market) | Configuration is certified for Non-Spinning DAM (Day Ahead Market). The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_ DAM [R] | No | Yes | m:LogicalGenerator/m:ResourceCertification/m:certifiedNonspinDAM | string |
| Certified for Non-Spin RTM (Real Time Market) | Configuration is certified for Non-Spinning RTM (Real Time Market). The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_ RTM [S] | No | Yes | m:LogicalGenerator/m:ResourceCertification/m:certifiedNonspinRTM | string |
| Certified for Regulation Down | Configuration is certified for Regulation Down. The acceptable values are 'YES' or 'NO'. | CERT_REG_D OWN [O] | No | Yes | m:LogicalGenerator/m:ResourceCertification/m:certifiedRegulationDown | string |
| Certified for Regulation Up | Configuration is certified for Regulation Up. The acceptable values are 'YES' or 'NO'. | CERT_REG_U P [P] | No | Yes | m:LogicalGenerator/m:ResourceCertification/m:certifiedRegulationUp | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|---|-------|--------|---|--------|
| Certified for Spin | Configuration is certified for Spinning. The acceptable values are 'YES' or 'NO'. | CERT_SPIN [Q] | No | Yes | m:LogicalGenerator/m:ResourceCertification/m:certifiedSpin | string |
| Min Load Major Maintenance Adder | This is a fixed adder which modifies the proxy minimum load in order to account for major maintenance expenses. | ADDER_AMT [T] | No | No | m:LogicalGenerator/m:minLoadMMA | float |
| RA Range Min | Together with RARangeMax, used to determine the default RA Provider (configuration) based on RA value; null means configuration will not be a default provider | MIN_RA_LIMIT [U] | No | Yes | m:LogicalGenerator/m:RARangeMin | float |
| RA Range Max | Together with RARangeMin, used to determine the default RA Provider (configuration) based on RA value; null means configuration will not be a default provider | MAX_RA_LIMIT [V] | No | Yes | m:LogicalGenerator/m:RARangeMax | float |
| <u>Configuration - Regulation Segments (0 to unbounded)</u> | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:RegulatingLimit/ | |
| High Limit Value | Higher level of the Regulation Range. | Higher MW for Regulation [E] | No | Yes | m:highLimit/m:value | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|---|---|-------|--------|--|---------|
| High Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:highLimit/m:units | string |
| Low Limit Value | Lower level of the Regulation Range. | Lower MW for Regulation [D] | No | Yes | m:lowLimit/m:value | float |
| Low Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:lowLimit/m:units | string |
| Segment Number | Number of the regulation range. Up to two segments allowed. If two are submitted, then segment number 1 must describe the lower range and segment number 2 must describe the upper range. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Configuration - Ramp Rates (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:RampRateCurve/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|----------------------|--|---|-------|--------|---------------|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Ramp MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Ramp Min Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Ramp Max Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|--|-------|--------|--|--------|
| Ramp Rate Type | The legitimate values are as follows: OP – Operational Ramp Rate REG – Regulation Ramp Rate OP_RES – Operating Reserve Ramp Rate | Based on the sheet name OP =RAMPRATE Sheet REG =REGRAMP Sheet OP_RES =OPERRES RAMP Sheet | Yes | Yes | m:rampRateType | string |
| Individual Ramp Rate Data (0 to unbounded) Substitute Ramp Rate Type for 'XX' to retrieve values by type | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:LogicalGenerator/m:RampRateCurve[m:rampRateType='XX'] /m:CurveScheduleDatas/ | |
| Ramp MW Output Value | The Generating Unit MW output of point i. The first point (1) of MW output must begin at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMax. This field only applies to ramp rate type "OP". Other types ("REG" and "OP_RES") should not include this field. | Operating Level [D] | No | Yes | m:xAxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|---|---|-------|--------|--|---------|
| Ramp Min Rate Value | The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1). The minimum ramp rate of the last point should = the previous one. This requires providing the minimum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Worst Operational Ramp Rate [E] | No | Yes | m:y1AxisData | float |
| Ramp Max Rate Value | The maximum ramp rate under the best operating condition of the Generating Unit between point (i) and the point (i+1). The maximum ramp rate of the last point should = the previous one. This requires providing the maximum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Best Operational Ramp Rate [F] | No | Yes | m:y2AxisData | float |
| Segment Number | Point numbers between the PMin and PMax of the Generating Unit output. The point numbering starts at 1. Up to 5 points allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Configuration - Heat Rate – Heat Rate Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:HeatRateCurve/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------------|---|---|-------|--------|---------------|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Heat Heat Rate Units | This field is not used. The assumed unit of measure is BTU/KW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Heat Emission Rate Units | This field is not used. The assumed unit of measure is lbs of NOx/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------------------------------|---|---|-------|--------|---|-------|
| Heat Rate Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:HeatRateCurve/m: CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |
| Heat – Heat Rate Value | For gas-fired units only, the average heat rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (PMin) and the last point (n) (PMax). If not a gas-fired unit, leave blank and <u>instead</u> complete the Average Heat Cost field. | Heat Rate [E] | No | Yes | m:y1AxisData | float |
| Heat Emission Rate Value | The emission rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin) and the last point (n) (PMax). | Heat Emission Rate [F] | No | Yes | m:y2AxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|---|---|-------|--------|-----------------|---|
| Segment Number | <p>The point numbers between the PMin and PMax of the Generating Unit output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p> <p>Note: Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Heat - Fuel Cost Curve (0 to unbounded) | | | | | | //m:MessagePayload/m:MasterFileRDTRRecord/m:RegisteredGenerator/m:LogicalGenerator/m:FuelCostCurve/ |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---------------------------------------|--|---|-------|--------|--|--------|
| Average Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Fuel Cost Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:LogicalGenerator/m:FuelCostCurve/m:CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |
| Average Cost Value | Use this value for non-gas fired units instead of Heat Rate. The average cost of the Generating Unit on point (i) in \$. If value at point (i) is not available, linear interpolation can be used to approximate the value. Average cost must be provided at the first point (1) (PMin) and the last point (n) (PMax). If gas-fired, make sure to enter a value in Heat Rate and leave this field blank. | Average Cost [G] | No | Yes | m:y1AxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|---|---|-------|--------|---|---------|
| Segment Number | <p>The point numbers between the PMin and PMax of the Generating Unit output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p> <p>Note: Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| <u>Configuration - Startup - Time</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpTimeCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|------------------------------------|---|---|-------|--------|--|--------|
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Time data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpTimeCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. Downtime must be set to the same value for each element of a segment (Time, Fuel, Aux, and Energy) to ensure consistent startup data content. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|---|---|-------|--------|---|---------|
| Startup Time Value | Startup Time is the time (in whole minutes) it takes a resource to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the Generating Unit (in minutes) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup time (in minutes) from cooling time (n) to infinity. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. | Start-Up Time [E] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponds to cooling time of the unit. The segment starts at 1. Up to 3 segments are allowed (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| <u>Configuration - Startup - Energy (0 to unbounded)</u> | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:StartUpEnergyCur ve/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------------------------|--|---|-------|--------|--|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is MW/Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Energy data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpEnergyCurve/m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Energy Value | The electrical power used by a Generating Unit during startup. The Generating Unit's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinite. | Start-Up Aux [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponds to cooling time of the unit. The segment starts at 1. Up to 3 segments are allowed (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|---|--|---|-------|--------|--|--------|
| <u>Configuration - Startup - Fuel</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpFuelCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Fuel Value Units | This field is not used. The assumed unit of measure is Million BTU. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Fuel data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpFuelCurve/m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Fuel Value | The fuel use (in mBTU per start) expected for the startup of a natural gas fired Generating Unit that has been off-line for a substantial period of time. The startup fuel of the Generating Unit (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinite. | Start-Up Fuel [H] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponds to cooling time of the unit. The segment starts at 1. Up to 3 segments are allowed (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|---|-------|--------|--|--------|
| Configuration - Startup - Cost (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpCost Curve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Cost data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpCost Curve/m:CurveScheduleDatas/ | |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|-------------------------|---|---|-------|--------|-----------------|---------|
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [E] | No | Yes | m:xAxisData | float |
| Startup Cost Value | The startup cost of non-natural gas fired Generating Units (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. | Start-Up Cost [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponds to cooling time of the unit. The segment starts at 1. Up to 3 segments are allowed (hot, warm and cold). | Segment Number [D] | Yes | Yes | m:segmentNumber | integer |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--|--|--|-------|--------|---|---------|
| Startup Major Maintenance Adder | The Major Maintenance Adder (MMA) provides for the definition of a cost adder curve used as an overlay to the initial StartUpCostCurve to account for major maintenance expenses | Start-Up MMA [J] | No | No | m:AdderCurve | float |
| <u>Transitions</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFile RDTRRecord/m:RegisteredGenerator/m:Transition/ | |
| From Configuration ID | This configuration ID is the starting point for a transition between two configurations. | TRANSITION Sheet CONFIG_ID_F ROM [B] | Yes | Yes | m:FromConfiguration/mrid | string |
| To Configuration ID | This configuration ID is the ending point for a transition between two configurations. | CONFIG_ID_T O [C] | Yes | Yes | m:ToConfiguration/mrid | string |
| Maximum Daily Transitions | Denotes the maximum number of times that this transition can be performed per day. | MAX_DAILY_T RANSITIONS [J] | Yes | Yes | m:maxDailyTransitions | integer |
| Notification Time | The time in minutes 'Configuration ID-To' requires before deployment. Notification time includes transition time. | NOTIFICATIO N_TIME [F] | No | Yes | m:notificationTime | float |

| Element | Data Description | RDT XLS Field [Column ⁴] | Req'd | Modify | XPath | Type |
|--------------------------|--|---|-------|--------|--------------------------------|---------|
| Transition Cost | The cost of moving from 'Configuration ID-From' to 'Configuration ID-To'. | TRANSITION_ COST [D] | No | Yes | m:transitionCost | float |
| Transition Ramp Time | The time in minutes it takes to move from 'Configuration ID-From' to 'Configuration ID-To' | TRANSITION_ RAMP_TIME [E] | Yes | Yes | m:transitionRampTime | float |
| Transition Midpoint MW | The MW level of the midpoint for a transition | TRANSITION_ MIDPOINT_M W [H] | No | Yes | m:transitionMidpointMW/m:value | float |
| Transition Midpoint Time | The time taken to reach the MW level of the midpoint for a transition | TRANSITION_ MIDPOINT_TI ME [I] | No | Yes | m:transitionMidpointTime | Integer |

5.7.2 Schema

5.7.2.1 GeneratorRDT_v4.xsd

5.7.3 Example XML File (GeneratorRDTEExample.xml)

```
<?xml version="1.0" encoding="UTF-8" ?>
```

- <!--

Sample XML file generated by XMLSpy v2013 rel. 2 sp2 (x64) (<http://www.altova.com>)

-->

```
- <GeneratorRDT xsi:schemaLocation="http://www.caiso.com/soa/GeneratorRDT_v4.xsd# GeneratorRDT_v4.xsd"
  xmlns="http://www.caiso.com/soa/GeneratorRDT_v4.xsd#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
  instance">
- <MessageHeader>
  <TimeDate>2001-12-17T09:30:47Z</TimeDate>
  <Source>String</Source>
  <Version>v20141001</Version>
  </MessageHeader>
- <MessagePayload>
- <MasterFileRDTRRecord>
  <Comment>String</Comment>
  <RDTEffectiveDate>2001-12-17T09:30:47Z</RDTEffectiveDate>
  <SchedulingCoordinator>String</SchedulingCoordinator>
- <RegisteredGenerator>
  <mrid>a</mrid>
  <name>String</name>
  <dispatchFlag>NO</dispatchFlag>
  <EIMParticipationFlag>NO</EIMParticipationFlag>
  <hourlyPredispatch>NO</hourlyPredispatch>
  <isAggregatedRes>NO</isAggregatedRes>
```

```
<LMPMFlag>NO</LMPMFlag>
<marketParticipationFlag>NO</marketParticipationFlag>
<mustOfferObligationQualified>N</mustOfferObligationQualified>
<priceSetFlagDA>NO</priceSetFlagDA>
<priceSetFlagRT>NO</priceSetFlagRT>
<resourceType>GEN</resourceType>
= <ForbiddenRegion>
  <crossTime>0</crossTime>
  <highMW>3.14159E0</highMW>
  <lowMW>3.14159E0</lowMW>
  <segmentNumber>0</segmentNumber>
  </ForbiddenRegion>
= <HostControlArea>
  <mrid>a</mrid>
  </HostControlArea>
= <maxOnTime>
  <units>String</units>
  <value>3.14159E0</value>
  </maxOnTime>
= <minOffTime>
  <units>String</units>
  <value>3.14159E0</value>
```



```
</minOffTime>
= <minOnTime>
  <units>String</units>
  <value>3.14159E0</value>
  </minOnTime>
= <RampRateCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
  <y2AxisUnits>MVar</y2AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  <y2AxisData>3.14159E0</y2AxisData>
  </CurveScheduleDatas>
  <rampRateType>OP</rampRateType>
  </RampRateCurve>
= <ResourceCapacity>
  <capacityType>NR</capacityType>
= <defaultCapacity>
  <units>String</units>
```

```
<value>3.14159E0</value>
  </defaultCapacity>
  </ResourceCapacity>
= <ResourceCertification>
  <certifiedBlackStart>NO</certifiedBlackStart>
  <certifiedDAM>NO</certifiedDAM>
  <certifiedNonspinDAM>NO</certifiedNonspinDAM>
  <certifiedNonspinRTM>NO</certifiedNonspinRTM>
  <certifiedPIRP>String</certifiedPIRP>
  <certifiedRegulationDown>NO</certifiedRegulationDown>
  <certifiedRegulationUp>NO</certifiedRegulationUp>
  <certifiedRTM>NO</certifiedRTM>
  <certifiedRUC>NO</certifiedRUC>
  <certifiedSpin>NO</certifiedSpin>
  </ResourceCertification>
  <AQMDistrict>String</AQMDistrict>
  <CHPResourceFlag>NO</CHPResourceFlag>
  <constrainedOutputFlag>NO</constrainedOutputFlag>
  <costRankLMPM>1</costRankLMPM>
  <discreteDispatchFlag>NO</discreteDispatchFlag>
  <energyEfficiency>3.14159E0</energyEfficiency>
  <forecastSelection>ISO</forecastSelection>
```

<fuelSource>**BGAS**</fuelSource>
<genToPumpMinDownTime>**0**</genToPumpMinDownTime>
<genType>**H**</genType>
<GHGEmissionFactor>**3.14159E0**</GHGEmissionFactor>
<GHGComplianceObligFlag>**NO**</GHGComplianceObligFlag>
<GHGCost>**5.00**</GHGCost>
<loadFollowingDownMSS>**NO**</loadFollowingDownMSS>
<loadFollowingUpMSS>**NO**</loadFollowingUpMSS>
<maxStartUpsPerDay>**0**</maxStartUpsPerDay>
<MLCostBasis>**PRXC**</MLCostBasis>
<MSGResourceFlag>**NO**</MSGResourceFlag>
<negotiateRankLMPM>**1**</negotiateRankLMPM>
<NGResourceFlag>**NO**</NGResourceFlag>
<PGAName>**String**</PGAName>
<priceRankLMPM>**1**</priceRankLMPM>
<priorityType>**String**</priorityType>
<pumpingFactor>**3.14159E0**</pumpingFactor>
<pumpMaxStartUps>**0**</pumpMaxStartUps>
<pumpShutdownCost>**3.14159E0**</pumpShutdownCost>
<pumpShutdownTime>**0**</pumpShutdownTime>
<pumpToGenMinDownTime>**0**</pumpToGenMinDownTime>
<qualifyingFacilityOwner>**String**</qualifyingFacilityOwner>

<REMFlag>**NO**</REMFlag>
<RMRFlag>**NO**</RMRFlag>
<startUpCodeType>**String**</startUpCodeType>
<startUpRampTime>**3.14159E0**</startUpRampTime>
<SUCostBasis>**PRXC**</SUCostBasis>
<suppliedConfigFlag>**NO**</suppliedConfigFlag>
<TGEnergyProductType>**DYN**</TGEnergyProductType>
<unitType>**CCYC**</unitType>
<useLimitFlag>**NO**</useLimitFlag>
<VERFlag>**NO**</VERFlag>

= <Configuration>

<mrid>**a**</mrid>
<name>**String**</name>

= <LogicalGenerator>

<minOffTime>**3.14159E0**</minOffTime>
<minOnTime>**3.14159E0**</minOnTime>
<RARangeMax>**3.14159E0**</RARangeMax>
<RARangeMin>**3.14159E0**</RARangeMin>
<startUpFlag>**YES**</startUpFlag>
<shutDownFlag>**NO**</shutDownFlag>
<startUpCodeType>**String**</startUpCodeType>
<startUpRampTime>**3.14159E0**</startUpRampTime>

```
= <FuelCostCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVA</y1AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  </CurveScheduleDatas>
</FuelCostCurve>
= <HeatRateCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVA</y1AxisUnits>
  <y2AxisUnits>MVA</y2AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  <y2AxisData>3.14159E0</y2AxisData>
  </CurveScheduleDatas>
</HeatRateCurve>
```

```
= <maximumOperatingMW>
  <units>String</units>
  <value>3.14159E0</value>
  </maximumOperatingMW>
= <minimumOperatingMW>
  <units>String</units>
  <value>3.14159E0</value>
  </minimumOperatingMW>
= <minLoadCost>
  <units>String</units>
  <value>3.14159E0</value>
  </minLoadCost>
= <minLoadMMA>
  <units>String</units>
  <value>3.14159E0</value>
  </minLoadMMA>
= <RampRateCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVAr</y1AxisUnits>
  <y2AxisUnits>MVAr</y2AxisUnits>
= <CurveScheduleDatas>
```

<segmentNumber>**0**</segmentNumber>

<xAxisData>**3.14159E0**</xAxisData>

<y1AxisData>**3.14159E0**</y1AxisData>

<y2AxisData>**3.14159E0**</y2AxisData>

</CurveScheduleDatas>

<rampRateType>**OP**</rampRateType>

</RampRateCurve>

= <RegulatingLimit>

<segmentNumber>**0**</segmentNumber>

= <highLimit>

<units>**String**</units>

<value>**3.14159E0**</value>

</highLimit>

= <lowLimit>

<units>**String**</units>

<value>**3.14159E0**</value>

</lowLimit>

</RegulatingLimit>

= <ResourceCapacity>

<capacityType>**NR**</capacityType>

= <defaultCapacity>

<units>**String**</units>

<value>**3.14159E0**</value>

</defaultCapacity>

</ResourceCapacity>

= <ResourceCertification>

<certifiedNonspinDAM>**NO**</certifiedNonspinDAM>

<certifiedNonspinRTM>**NO**</certifiedNonspinRTM>

<certifiedRegulationDown>**NO**</certifiedRegulationDown>

<certifiedRegulationUp>**NO**</certifiedRegulationUp>

<certifiedSpin>**NO**</certifiedSpin>

</ResourceCertification>

= <StartUpCostCurve>

<description>**a**</description>

<xAxisUnits>**MW**</xAxisUnits>

<y1AxisUnits>**MVAr**</y1AxisUnits>

= <CurveScheduleDatas>

<segmentNumber>**0**</segmentNumber>

<xAxisData>**3.14159E0**</xAxisData>

<y1AxisData>**3.14159E0**</y1AxisData>

</CurveScheduleDatas>

= <AdderCurve>

<description>**a**</description>

<xAxisUnits>**MW**</xAxisUnits>

<y1AxisUnits>**MVAr**</y1AxisUnits>

= <CurveScheduleDatas>

<segmentNumber>**0**</segmentNumber>

<xAxisData>**3.14159E0**</xAxisData>

<y1AxisData>**3.14159E0**</y1AxisData>

</CurveScheduleDatas>

</AdderCurve>

</StartupCostCurve>

= <StartupEnergyCurve>

<description>**a**</description>

<xAxisUnits>**MW**</xAxisUnits>

<y1AxisUnits>**MVAr**</y1AxisUnits>

= <CurveScheduleDatas>

<segmentNumber>**0**</segmentNumber>

<xAxisData>**3.14159E0**</xAxisData>

<y1AxisData>**3.14159E0**</y1AxisData>

</CurveScheduleDatas>

</StartupEnergyCurve>

= <StartupFuelCurve>

<description>**a**</description>

<xAxisUnits>**MW**</xAxisUnits>

<y1AxisUnits>**MVAr**</y1AxisUnits>

```
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  </CurveScheduleDatas>
</StartupFuelCurve>
= <StartupTimeCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  </CurveScheduleDatas>
</StartupTimeCurve>
</LogicalGenerator>
</Configuration>
= <curtailmentEnergyLimit>
  <units>String</units>
  <value>3.14159E0</value>
  </curtailmentEnergyLimit>
```

```
= <FuelCostCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  </CurveScheduleDatas>
  </FuelCostCurve>
= <FuelRegion>
  <fuelRegionType>String</fuelRegionType>
  </FuelRegion>
= <HeatRateCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
  <y2AxisUnits>MVar</y2AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
```

```
<y2AxisData>3.14159E0</y2AxisData>
```

```
</CurveScheduleDatas>
```

```
</HeatRateCurve>
```

```
= <maxContinuousEnergyLimit>
```

```
<units>String</units>
```

```
<value>3.14159E0</value>
```

```
</maxContinuousEnergyLimit>
```

```
= <maximumOperatingMW>
```

```
<units>String</units>
```

```
<value>3.14159E0</value>
```

```
</maximumOperatingMW>
```

```
= <maxPumpingLevel>
```

```
<units>String</units>
```

```
<value>3.14159E0</value>
```

```
</maxPumpingLevel>
```

```
= <minContinuousEnergyLimit>
```

```
<units>String</units>
```

```
<value>3.14159E0</value>
```

```
</minContinuousEnergyLimit>
```

```
= <MinDispatchLevel>
```

```
<units>String</units>
```

```
<value>3.14159E0</value>
```

</MinDispatchLevel>

= <minimumOperatingMW>

<units>**String**</units>

<value>**3.14159E0**</value>

</minimumOperatingMW>

= <minLoadCost>

<units>**String**</units>

<value>**3.14159E0**</value>

</minLoadCost>

= <minLoadMMA>

<units>**String**</units>

<value>**3.14159E0**</value>

</minLoadMMA>

= <operatingMaintenanceCost>

<units>**String**</units>

<value>**3.14159E0**</value>

</operatingMaintenanceCost>

= <pumpingCost>

<units>**String**</units>

<value>**3.14159E0**</value>

</pumpingCost>

= <pumpMinDownTime>

<units>**String**</units>

<value>**3.14159E0**</value>

</pumpMinDownTime>

= <pumpMinUpTime>

<units>**String**</units>

<value>**3.14159E0**</value>

</pumpMinUpTime>

= <raiseRampRate>

<units>**String**</units>

<value>**3.14159E0**</value>

</raiseRampRate>

= <RegulatingLimits>

<segmentNumber>**0**</segmentNumber>

= <highLimit>

<units>**String**</units>

<value>**3.14159E0**</value>

</highLimit>

= <lowLimit>

<units>**String**</units>

<value>**3.14159E0**</value>

</lowLimit>

</RegulatingLimits>

```
= <RegulatoryMustTakeGeneration>
  <RMTGCapacityExpDate>2001-12-17T09:30:47Z</RMTGCapacityExpDate>
  <RMTGCapacityType>String</RMTGCapacityType>
= <RMTGCapacity>
  <units>String</units>
  <value>3.14159E0</value>
  </RMTGCapacity>
  </RegulatoryMustTakeGeneration>
= <StartUpCostCurves>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
= <CurveScheduleDatas>
  <segmentNumber>0</segmentNumber>
  <xAxisData>3.14159E0</xAxisData>
  <y1AxisData>3.14159E0</y1AxisData>
  </CurveScheduleDatas>
= <AdderCurve>
  <description>a</description>
  <xAxisUnits>MW</xAxisUnits>
  <y1AxisUnits>MVar</y1AxisUnits>
= <CurveScheduleDatas>
```

```
<segmentNumber>0</segmentNumber>
```

```
<xAxisData>3.14159E0</xAxisData>
```

```
<y1AxisData>3.14159E0</y1AxisData>
```

```
</CurveScheduleDatas>
```

```
</AdderCurve>
```

```
</StartupCostCurves>
```

```
= <StartupEnergyCurve>
```

```
<description>a</description>
```

```
<xAxisUnits>MW</xAxisUnits>
```

```
<y1AxisUnits>MVar</y1AxisUnits>
```

```
= <CurveScheduleDatas>
```

```
<segmentNumber>0</segmentNumber>
```

```
<xAxisData>3.14159E0</xAxisData>
```

```
<y1AxisData>3.14159E0</y1AxisData>
```

```
</CurveScheduleDatas>
```

```
</StartupEnergyCurve>
```

```
= <StartupFuelCurve>
```

```
<description>a</description>
```

```
<xAxisUnits>MW</xAxisUnits>
```

```
<y1AxisUnits>MVar</y1AxisUnits>
```

```
= <CurveScheduleDatas>
```

```
<segmentNumber>0</segmentNumber>
```



```
<xAxisData>3.14159E0</xAxisData>
```

```
<y1AxisData>3.14159E0</y1AxisData>
```

```
</CurveScheduleDatas>
```

```
</StartupFuelCurve>
```

```
= <StartupTimeCurve>
```

```
<description>a</description>
```

```
<xAxisUnits>MW</xAxisUnits>
```

```
<y1AxisUnits>MVA</y1AxisUnits>
```

```
= <CurveScheduleDatas>
```

```
<segmentNumber>0</segmentNumber>
```

```
<xAxisData>3.14159E0</xAxisData>
```

```
<y1AxisData>3.14159E0</y1AxisData>
```

```
</CurveScheduleDatas>
```

```
</StartupTimeCurve>
```

```
= <Transition>
```

```
<maxDailyTransitions>0</maxDailyTransitions>
```

```
<notificationTime>3.14159E0</notificationTime>
```

```
<transitionCost>3.14159E0</transitionCost>
```

```
<transitionRampTime>3.14159E0</transitionRampTime>
```

```
= <FromConfiguration>
```

```
<mrid>a</mrid>
```

```
</FromConfiguration>
```

```

=<ToConfiguration>
<mrid>a</mrid>
</ToConfiguration>
</Transition>
</RegisteredGenerator>
</MasterFileRDTRecord>
</MessagePayload>
</GeneratorRDT>

```

5.8 Submit Generator RDT Update Response

5.8.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|---------|------------------|---------------------------|-------|--------------------------------|------|
| | | | | //m:outputDataType/m:EventLog/ | |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-----------------------------|---|---------------------------|-------|--|----------|
| Event Result | The result contains the number of records retrieved and batch number that was created on submission. For example, "Records received=19, batchId=7862" | n/a | yes | m:Event/m:result | string |
| Event Id | The batch Id that was generated | n/a | yes | m:Event/m:id | string |
| Event Description | Success or failure message. | n/a | no | m:Event/m:description | string |
| Event Creation Time | The creation time in real time format | n/a | no | m:Event/m:creationTime | string |
| Service Id | The service Id (created by the web services framework) | n/a | yes | m:Service/m:id | DateTime |
| Service Name | The name of the service as used by the Web Service. | n/a | yes | m:Service/m:name | string |
| | Optional/Unbounded | | | //m:outputDataType/m:EventLog/m:GeneratorRDT | |
| Generator RDT - Resource ID | If GeneratorRDT exists then resource id must exist | n/a | yes | m:resource_ID | string |
| Generator RDT - Results | Contains error messages pertaining to the submitted Generator update. May have multiple occurrences (unbounded) | n/a | no | m:results | string |

5.8.2 Schema

5.8.2.1 SubmitGeneratorRDTStandardOutput.xsd

5.8.3 Example XML File (SubmitGeneratorStandardOutput.xml)

```
<submitGeneratorRDT xmlns="http://www.caiso.com/soa/2008-08-09/submitGeneratorRDT">
```

```

<outputDataType xmlns="http://www.caiso.com/soa/2008-08-09/SubmitGeneratorRDTStandardOutput.xsd">
  <EventLog>
    <Event>
      <result>Records received=19, batchId=7862</result>
      <id>7862</id>
      <description>Generator updates were successfully received.</description>
      <creationTime>2008-10-14T11:05:01.312-07:00</creationTime>
    </Event>
  <Service>
    <id>abd9f2ae-9110-4cb1-b14d-1427ea809735</id>
    <name>submitGeneratorRDT</name>
  </Service>
</EventLog>
</outputDataType>
</submitGeneratorRDT>

```

5.9 Fault Return

5.9.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|---------|-----------------------|---------------------------|-------|--|--------|
| Id | Event log identifier. | N/A | No | //m:outputDataType/m:EventLog/ m:id | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|------------------------|--------------------------------|---------------------------|-------|--------------------------|----------|
| Name | Event log name. | N/A | No | m:name | string |
| description | Event log description. | N/A | No | m:description | string |
| Type | Event log type. | N/A | No | m:type | string |
| Creation Time | Event log creation time. | N/A | No | m:creationTime | date |
| Collection Type | Event log collection type. | N/A | No | m:collectionType | string |
| Collection Quantity | Event log collection quantity. | N/A | No | m:collectionQuantity | string |
| Event Result | Event result. | N/A | Yes | m:Event/m:result | string |
| Event Id | Event identifier. | N/A | No | m:Event/m:id | string |
| Event Name | Event name. | N/A | No | m:Event/m:name | string |
| Event Description | Event description. | N/A | No | m:Event/m:description | string |
| Event CreationTime | Event creation time. | N/A | No | m:Event/m:creationTime | dateTime |
| Event Severity | Event severity. | N/A | No | m:Event/m:severity | string |
| Event Priority | Event priority. | N/A | No | m:Event/m:priority | string |
| Event. Sequence Number | Event sequence number. | N/A | No | m:Event/m:sequenceNumber | string |
| Event Type | Event type. | N/A | No | m:Event/m:eventType | string |
| Service Id | Service identifier. | N/A | Yes | m:Service/m:id | string |
| Service Name | Service name. | N/A | Yes | m:Service/m:name | string |
| Service Description | Service description. | N/A | Yes | m:Service/m:description | string |
| Service Comments | Service comments. | N/A | Yes | m:Service/m:comments | string |

5.9.2 Schema

5.9.2.1 StandardOutput.xsd

5.9.3 Example XML File (StandardOutput.xsd)

```
<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
    <m:description>The Event Description</m:description>
    <m:type>Error Event</m:type>
    <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
    <m:collectionType>Submit Generator RDT Update</m:collectionType>
    <m:collectionQuantity>1</m:collectionQuantity>
    <m:Event>
      <m:result>Invalid Value Found in Field XX</m:result>
      <m:id>1234</m:id>
      <m:name>Error Event 1234</m:name>
      <m:description>An invalid data value was presented</m:description>
      <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
      <m:severity>High</m:severity>
      <m:priority>High</m:priority>
      <m:sequenceNumber>1</m:sequenceNumber>
      <m:eventType>Initiated by MF API</m:eventType>
    </m:Event>
  </m:EventLog>
</m:outputDataType>
</xml>
```

```
<m:Service>  
  <m:id>1234567</m:id>  
  <m:name>Submit Generator RDT Update</m:name>  
  <m:description>Having problems - Invalid data has been presented</m:description>  
  <m:comments>Some one needs to fix the data and resubmit</m:comments>  
</m:Service>  
</m:EventLog>  
</m:outputDataType>
```

6 Retrieve Generator RDT Data

6.1 Business Scenario

Scheduling Coordinators retrieve Generator RDT Data to view operational data parameters for their resources that reside in the Master File. While many Scheduling Coordinators Retrieve their RDT Data via the UI manually, some Scheduling Coordinators Retrieve their RDT Data in batch mode through an automated process using the API. If a generator is a MSG (Multi-Stage Generator) then Configurations and Transitions will be returned, otherwise they will not be returned. If a generator is an aggregated generator, then physical generating units that make up the aggregated generator will be returned.

6.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|--|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | 6KB for one RDT, 1.2MB Max, 250 KB Average |
| Expected frequency (average and maximum) | Average of 10 and maximum of 80 retrievals per day |
| Longest time the service can be unavailable before business is impacted | One Day |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not complete Retrieving all their Data. They would have to wait longer for Data to be available. |
| Expected response time for the service | 60 Seconds |

6.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Retrieve messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a RetrieveGeneratorRDT service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes a request to Master File with Generator RDT resource data by invoking the Retrieve Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator provides criteria to find one or more Generator RDTs, the input is provided to the Master File data in XML format.
- 2) Scheduling Coordinator validates the data set based on the XML schema.
- 3) Scheduling Coordinator invokes the RetrieveGeneratorRDT_v4 web service directly to send a request to Master File with the Generator RDT resource data set
- 4) Master File returns the requested payload of a Generator resource message back to Scheduling Coordinator.

There is one web service involved: **RetrieveGeneratorRDT_v4**

6.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|-------------------------|---------------|------------------------------|--|--|
| RetrieveGeneratorRDT_v4 | Input | RetrieveGeneratorRDTRequest | RetrieveGeneratorRDT_v4.wsdl | RequestGeneratorRDT.xsd |
| | Output | RetrieveGeneratorRDTResponse | RetrieveGeneratorRDT_v4_DocAttach.wsdl | GeneratorRDT_v4.xsd StandardAttachmentInfor.xsd |
| | Fault | FaultReturnType | | StandardOutput.xsd |

6.4.1 Operation Details – WSDL URLs

Production Environment - TBD

6.5 WSDL (*RetrieveGeneratorRDT_v4.wsdl*)

6.5.1 RetrieveGeneratorRDT_v4.wsdl - Used for normal SOAP messaging

6.5.2 RetrieveGeneratorRDT_v4_DocAttach.wsdl - Used when .Net is the source of processing

6.6 Request Generator RDT Information

The request for Generator RDTs allows the API to search for Generator RDTs by the criteria specified in the XSD.

6.6.1 Element table

| Element | Data Description | Req'd | XPath | Type |
|------------------------|---|-------|------------------------|--|
| | | | //RequestGeneratorRDT/ | |
| Trade Date | The point in time when the system is to search for resources of the specified SC ID. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). Data from the wrong date may be returned if time is not set to midnight. | Yes | tradeDate | dateTime See Appendix 1 |
| Scheduling Coordinator | The ID of the Scheduling Coordinator | Yes | schedulingCoordinator | string |
| Resource Type | Type of Generator (ALL, GEN, LOAD, or TG) | Yes | resourceType | string |
| Resource ID | Either ALL resources or one specific resource ID | Yes | resourceID | string |

6.6.2 Schema

6.6.2.1 RequestGeneratorRDT.xsd

6.6.3 Example XML File (RequestGeneratorRDTEExample.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<RequestGeneratorRDT xsi:schemaLocation="http://www.aiso.com/soa/2008-08-09/RequestGeneratorRDT.xsd
RequestGeneratorRDT.xsd" xmlns="http://www.aiso.com/soa/2008-08-09/RequestGeneratorRDT.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <tradeDate>2001-12-17T00:00:00.000-07:00</tradeDate>
  <schedulingCoordinator>ABCD</schedulingCoordinator>
  <resourceType>ALL</resourceType>
  <resourceID>ALL</resourceID>
</RequestGeneratorRDT>
```

6.7 Standard Attachment Information

The attachment information schema, StandardAttachmentInfor.xsd, is used to provide general information for an SOAP attachment. The root element in the schema is *standardAttachmentInfor*, which can contain one or more attachment elements.

6.7.1 Element table

| Element | Data Description | Req'd | XPath | Type |
|-------------|-----------------------------|-------|-------|--------|
| id | Globally unique identifier. | No | | string |
| name | Attachment filename. | No | | string |
| description | Description of attachment. | No | | string |

| Element | Data Description | Req'd | XPath | Type |
|-------------------------|--|-------|-------|----------|
| version | Version ID of attachment file | No | | string |
| Sequence Number | Sequence number if there are multiple attachments. | No | | string |
| Type | Attachment file type, such as zip or jpeg. | No | | string |
| Size | Size of attachment file. | No | | string |
| source | Source of attachment file. | No | | string |
| tool | Tool used to generate attachment. | No | | string |
| Creation Time | Time attachment file was created. | No | | dateTime |
| Compress Flag | Indicates whether or not attachment has been compressed (YES or NO). | No | | string |
| Compress Method | Compress method used (if attachment file compressed). | No | | string |
| Attribute List Sequence | Attribute list sequence number. | No | | string |
| Attribute List Name | Name of an attribute | No | | string |
| Attribute List Value | Value of an attribute | No | | string |

6.7.2 Schema

6.7.2.1 StandardAttachmentInfor.xsd

6.7.3 Example XML File (StandardAttachmentInfor.xml)

```
<?xml version="1.0" encoding="UTF-8" ?>
```

```

<!--
Sample XML file generated by XMLSpy v2006 U (http://www.altova.com)
-->
<standardAttachmentInfor xmlns="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardAttachmentInfor.xsd">
  <Attachment>
    <id> 15798563</id>
    <name>GWED_11</name>
    <description>GENERATOR RDT ATTACHEMENT</description>
    <version>1.1</version>
    <sequenceNumber>12</sequenceNumber>
    <type>ZIP</type>
    <size>180</size>
    <source>GWED</source>
    <tool>GZIP</tool>
    <creationTime>2006-12-17T09:30:47.0-08:00</creationTime>
    <compressFlag>yes</compressFlag>
    <compressMethod>ZIP</compressMethod>
    <AttributeList>
      <Sequence>2</Sequence>
      <Name>GWED</Name>
      <Value>1</Value>
    </AttributeList>
  </Attachment>
</standardAttachmentInfor>

```

6.8 Retrieve Generator RDT Data

Generator RDT Data output occurs when a Scheduling Coordinator submits the Retrieve XML file.

6.8.1 Element Table:

[Click here to go to the Generator Payload](#)

| | | | |
|-----------------------------|--|--|--|
| Registered Generator | | | |
|-----------------------------|--|--|--|

| Resource Details | | | | | //m:MessagePayload/m:MasterFileRDTRRecord/m:RegisteredGenerator/ | |
|------------------------|--|-----------------|-----|-----|--|--------|
| Name | Descriptive name for the Resource. | RES_NAME [D] | No | No | m:name | |
| Mrid | The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes. | RES_ID [C] | Yes | No | m:mrid | string |
| Resource Type | Descriptive identifier denoting the type of resource: Generating Unit, Tie Generator, Load. The acceptable values are: GEN, LOAD, and TG | RES_TYPE [E] | Yes | No | m:resourceType | string |
| Minimum Off Time Value | The minimum amount of time that a Generating Unit must stay off-line after being shut down, due to physical operating constraints. Minimum Off Time includes Startup Time. | MIN_OFF [R] | No | Yes | m:minOffTime/m:value | float |
| Minimum Off Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minOffTime/m:units | string |

| | | | | | | |
|------------------------|--|---------------------------|----|-----|-------------------------|--------|
| Minimum On Time Value | The minimum amount of time that a Generating Unit must stay on-line after starting up and reaching PMin, prior to being shut down, due to physical operating constraints. | MIN_ON [P] | No | Yes | m:minOnTime/m:value | float |
| Minimum On Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minOnTime/m:units | string |
| Maximum On Time Value | The maximum amount of time that a Generating Unit can stay on-line per day, due to environmental or physical operating constraints. If no constraint, then leave this field blank. | MAX_ON [Q] | No | Yes | m:maxOnTime/m:value | float |
| Maximum On Time Unit | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maxOnTime/m:units | string |
| Dispatchable Flag | Designates a dispatchable resource. The acceptable values are 'YES' and 'NO' | DISP [BH] | No | No | m:dispatchFlag | string |
| Discrete Dispatch Flag | A discrete dispatch resource can only be dispatched in blocks of MWs rather than continuously. The acceptable values are 'YES' and 'NO'. | DISCRETE_DIS P [BI] | No | No | m: discreteDispatchFlag | string |

| | | | | | | |
|-------------------------------------|--|---------------------------|-----|-----|--------------------------------|--------|
| An Aggregate Resource? | An aggregation that consists of several individual "child" resources. The acceptable values are 'YES' and 'NO' | AGGREGATE_Y N [F] | Yes | No | m:isAggregatedRes | string |
| LMPM Flag | An identifier of a resource that is subject to the market power mitigation process. Defined per tariff. The acceptable values are 'YES' and 'NO' | LMPM [AU] | No | No | m:LMPMFlag | string |
| Must Offer Obligation Qualified | Y - Resource is Must Offer N - Resource is not Must Offer R - Resource is eligible for Must Offer based on RA Capacity or RCST designation in any given trading hour | MOO_QUALIFIE D [AM] | No | No | m:mustOfferObligationQualified | string |
| Market Participant Flag | An identifier of the PGA Resources that participates in the market. The acceptable values are 'YES' and 'NO' | PGA_PART [AO] | No | No | m:marketParticipationFlag | string |
| | | | | | | |
| Price Set Flag for Day Ahead Market | Indicator of resource being able to set the price in DA market. The acceptable values are 'YES' and 'NO' | PRC_SET_DAM [BL] | No | No | m:priceSetFlagDA | string |
| Price Set Flag for Real Time Market | Indicator of resource being able to set the price in RT market. The acceptable values are 'YES' and 'NO' | PRC_SET_RTM [BM] | No | No | m:priceSetFlagRT | string |
| Maximum Operating MW Value | The maximum normal capability of the Generating Unit. | MAX_GEN [M] | No | Yes | m:maximumOperatingMW/m:value | float |

| | | | | | | |
|----------------------------|---|----------------|----|-----|------------------------------|--------|
| Maximum Operating MW Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maximumOperatingMW/m:units | string |
| Minimum Operating MW Value | For a Generating Unit, the minimum sustained operating level (Pmin or plant minimum) at which it can operate at a continuous level. | MIN_GEN [N] | No | Yes | m:minimumOperatingMW/m:value | float |
| Minimum Operating MW Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minimumOperatingMW/m:units | string |
| Raise Ramp Rate Value | Represents the fastest Best Operating Ramp Rate in the RAMP curve | MAX_RR [BK] | No | No | m:raiseRampRate/m:value | float |
| Raise Ramp Rate Units | This field is not used. The assumed unit of measure is MW/Min. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:raiseRampRate/m:units | string |

| | | | | | | |
|-------------------------|--|--------------------------|----|-----|-----------------------|--------|
| Unit Type | Description of prime mover technology associated with the Generating Unit; such as, Hydro Turbine, Gas Turbine, Combined Cycle, etc. The acceptable values are: "CCYC", "GTUR", "HYDR", "OTHR", "PHOT", "PTUR", "RECP", "STUR", "SYNC", "WIND", "PUMP" | GEN_TECH_TY PE [I] | No | No | m:unitType | string |
| Generator Type | 'H' - Hydro resources 'T' - All other resources | GEN_TYPE [J] | | No | m:genType | string |
| RMR Flag | Designates a resource that has a Reliability Must Run contract. The acceptable values are 'YES' and 'NO' | RMR [BJ] | No | No | m:RMRFlag | string |
| Use Limit | Identifier if a resource is energy use limited, such as limitation of energy or emission control, etc. The acceptable values are 'YES' and 'NO' | USE_LIMIT [BD] | No | Yes | m:useLimitFlag | string |
| Minimum Load Cost Value | The costs a Generating Unit or a Participating Load incurs operating at minimum load. The value is needed for a resource with the Cost Basis of Registered Cost (fixed value) only. | MIN_LOAD_COS T [T] | No | Yes | m:minLoadCost/m:value | float |
| Minimum Load Cost Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:minLoadCost/m:units | string |

| | | | | | | |
|----------------------------------|---|---------------------------|----|-----|------------------------------------|--------|
| Maximum Pumping Level Value | The Maximum Operating Level of a Pump or a Pumped-Storage Hydro Unit operating as a hydro pump. | MAX_PUMP [W] | No | Yes | m:maxPumpingLevel/m:value | float |
| Maximum Pumping Level Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maxPumpingLevel/m:units | string |
| Operating Maintenance Cost Value | Variable operations and maintenance costs, a component of the Variable Cost option for calculating the Default Energy Bid. | OPER_MAINT_COST [BE] | No | No | m:operatingMaintenanceCost/m:value | float |
| Operating Maintenance Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:operatingMaintenanceCost/m:units | string |
| MLCost Basis | Cost option (proxy or registered) for a generating resource's Minimum Load cost. | ML_COST_BASIS_TYPE [U] | No | Yes | m:MLCostBasis | string |
| SUCost Basis | Cost option (proxy or registered) for a generating Resource's Startup Cost. | SU_COST_BASIS_TYPE [V] | No | Yes | m:SUCostBasis | string |

| | | | | | | |
|--------------------------|--|-----------------------|----|-----|-------------------------|---------|
| Fuel Source | Description of primary fuel type; such as, Natural Gas, Oil, Nuclear, etc. The acceptable values are: "BGAS", "BIOM", "COAL", "DIST", "GAS", "GEOT", "HRCV", "NONE", "NUCL", "OIL", "OTHR", "SOLR", "WAST", "WATR", "WIND", "LESR", "DDR", <u>"GNRC"</u> . | FUEL_TYPE [H] | No | No | m:fuelSource | string |
| Constrained Output Flag | The output of the generation resources is not variable, i.e. PMax = PMin. Y: output is constrained. The acceptable values are 'YES' and 'NO' | COG [AP] | No | No | m:constrainedOutputFlag | string |
| Maximum Startups Per Day | The maximum number of times a Generating Unit can be started up within one day, due to environmental or physical operating constraints. | MAX_STRT [S] | No | Yes | m:maxStartUpsPerDay | Integer |
| Pumping Cost Value | The minimum pumping cost | MIN_PUMP_CST [X] | No | Yes | m:pumpingCost/m:value | float |
| Pumping Cost Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpingCost/m:units | string |
| Pumping Factor | Pumping factor of a pumping resource | PUMPING_FACTOR [Y] | No | Yes | m:pumpingFactor | float |

| | | | | | | |
|------------------------------|--|--------------------------|----|-----|---------------------------|--------|
| Qualifying Facility Owner | Identifier if a resource is a qualifying cogeneration facility or small qualifying power production facility, as defined in the Code of Federal Regulations, Title 18, Part 292 | QF [BC] | No | No | m:qualifyingFacilityOwner | string |
| Pump Minimum Up Time Value | Minimum pumping run time | PUMP_MIN_UP_TM [AA] | No | Yes | m:pumpMinUpTime/m:value | float |
| Pump Minimum Up Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpMinUpTime/m:units | string |
| Pump Minimum Down Time Value | The minimum amount of time that a pumping resource must stay off-line after shutting down. | PUMP_MIN_DW_N_TM [AB] | No | Yes | m:pumpMinDownTime/m:value | float |
| Pump Minimum Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:pumpMinDownTime/m:units | string |

| | | | | | | |
|-------------------------------|---|------------------------|----|-----|-------------------------|---------|
| Gen-to-Pump Minimum Down Time | The Gen-to-Pump minimum down time. Applies to Pump Storage Resource: Minimum time (in minutes) that resource must be offline (or self-scheduled) after being de-committed by Market system from generation operation and before being dispatched in pumping mode | MIN_DWN_TM_GP [AC] | No | Yes | m: genToPumpMinDownTime | integer |
| Pump-to-Gen Minimum Down Time | The Pump-to-Gen minimum down time. Applies to Pump Storage Resources: Minimum time (in minutes) that resource must be offline (or self-scheduled) after being de-committed from pumping operation and before being dispatched in generation mode. | MIN_DWN_TM_PG [AD] | No | Yes | m: pumpToGenMinDownTime | integer |
| Cost Rank LMPM | A method of calculating Default energy Bids based on fuel costs and variable operations and maintenance costs. Acceptable values for Rank 1, 2, or 3 | COST_RANK_LMPM [AG] | No | Yes | m:costRankLMPM | string |
| Price Rank LMPM | A method of calculating Default energy Bids based Locational Marginal Prices. Acceptable values for Rank 1, 2, or 3 | PRC_RANK_LMPM [AI] | No | Yes | m:priceRankLMPM | string |
| Negotiated Rank LMPM | A method of calculating Default energy Bids based on a negotiation with the CAISO or the Independent Entity. Rank 1, 2, or 3 | NEGO_RANK_LMPM [AH] | No | Yes | m:negotiateRankLMPM | string |

| | | | | | | |
|--|--|-------------------------|----|-----|------------------------|---------|
| Load Following Up MSS | Identifier if a resource is load following up. The acceptable values are 'YES' or 'NO'. | MSS_LD_FLNG_UP [BB] | No | No | m:loadFollowingUpMSS | string |
| Load Following Down MSS | Identifier if a resource is load following down. The acceptable values are 'YES' or 'NO'. | MSS_LD_FLNG_DWN [BA] | No | No | m:loadFollowingDownMSS | string |
| Pump Shutdown Time | The pump shutdown time | PUMP_SHTDWN_TM [AF] | No | Yes | m:pumpShutdownTime | integer |
| Pump Shutdown Cost | The maximum pump shutdown cost | MAX_PUMP_SD_CST [AE] | No | Yes | m:pumpShutdownCost | float |
| TG Energy Product Type | Energy Type: 'DYN' - Dynamic Resource (only if RES_TYPE='TG') 'FIRM' – is valid too | ENERGY_TYPE [G] | No | No | m:TGEnergyProductType | string |
| Air Quality Management District | The Air Quality Management District or Air Pollution Control District in which the resource is located. | AQM_DIST_TYP E [L] | No | No | m:AQMDistrict | string |
| Participating Generator Agreement Name | The name of an agreement between the CAISO and a Participating Generator; a pro forma version of which is set forth in Appendix B.2 of the CAISO Tariff. | PGA_NAME [A] | No | No | m:PGAName | string |

| | | | | | | |
|------------------------------|---|------------------------------|-----|-----|---|---------|
| Priority Type | MT - Regulatory Must Take resources REGM - Regulatory Must-Run RMR - Reliability Must Run PIRP - Participate in PIRP program | PRIOR_TYPE [BG] | No | No | m:priorityType | string |
| Startup Code Type | Code used to determine the startup characteristics. FAST: Generating Units that have a Start Up Time of ten minutes or less and can provide non-spin. Blank: All other resources. | STARTUP_CD_T TYPE [AN] | No | No | m:StartUpCodeType | string |
| Minimum Dispatch Level Value | The minimum operating level at which a Generating Unit is able to readily respond to a dispatch instruction. | MIN_DISP_LEVE L [O] | No | Yes | m:MinDispatchLevel/m:value | float |
| Minimum Dispatch Level Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:MinDispatchLevel /m:units | string |
| Pump Shutdown Time | The maximum pump start ups per day | PUMP_MAX_ST ARTUPS [Z] | No | Yes | m:pumpMaxStartUps | integer |
| Spin Capacity Value | The portion of unloaded synchronized generating capacity that is immediately responsive to system frequency and that is capable of being loaded in ten minutes, and that is capable of running for at least two hours. | RSRV_CAP_SPI N [AJ] | Yes | Yes | m:ResourceCapacity[m:capacityType='SR']/ m:defaultCapacity/m:value | float |

| | | | | | | |
|-------------------------|---|----------------------------|-----|-----|---|--------|
| Spin Capacity Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:ResourceCapacity[m:capacityType='SR']/m:defaultCapacity/m:units | string |
| Spin Capacity Type | Capacity Type must be set to 'SR'. | n/a | No | n/a | m:ResourceCapacity/m:capacityType='SR' | string |
| Non-Spin Capacity Value | The portion of off-line generating capacity that is capable of being synchronized and Ramping to a specified load in ten minutes (or load that is capable of being interrupted in ten minutes) and that is capable of running (or being interrupted.) | RSRV_CAP_NS PIN [AK] | Yes | Yes | m:ResourceCapacity[m:capacityType='NR']/m:defaultCapacity/m:value | float |
| Non-Spin Capacity Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:ResourceCapacity[m:capacityType='NR']/m:defaultCapacity/m:units | string |
| Non-Spin Capacity Type | Capacity Type must be set to 'NR' | n/a | No | n/a | m:ResourceCapacity/m:capacityType='NR' | string |
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| Certified Nonspin DAM | An identifier of a resource that is certified to provide Non-Spinning Reserve in the DAM. The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_DAM [AY] | No | Yes | m:ResourceCertification/m:certifiedNonspinDAM | string |
| Certified Nonspin RTM | An identifier of a resource that is certified to provide Non-Spinning Reserve in the RTM. To be procured in the RTM, a unit must also have a Startup Code Type of FAST. The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_RTM [AZ] | No | Yes | m:ResourceCertification/m:certifiedNonspinRTM | string |
| Certified PIRP | Resource is treated as in PIRP program and is certified (is eligible for Settlements treatment as PIRP participant). The acceptable values are 'YES' or 'NO'. | CERT_PIRP [AL] | No | No | m:ResourceCertification/m:certifiedPIRP | string |
| Certified Regulation Down | An identifier of a resource that is certified to provide Regulation Down Reserve. The acceptable values are 'YES' or 'NO'. | CERT_REG_DOWN [AV] | No | Yes | m:ResourceCertification/m:certifiedRegulationDown | string |
| Certified Regulation Up | An identifier of a resource that is certified to provide Regulation Up Reserve. The acceptable values are 'YES' or 'NO'. | CERT_REG_UP [AW] | No | Yes | m:ResourceCertification/m:certifiedRegulationUp | string |
| Certified Spin | An identifier of a resource that is certified to provide Spinning Reserve.. The acceptable values are 'YES' or 'NO'. | CERT_SPIN [AX] | No | Yes | m:ResourceCertification/m:certifiedSpin | string |
| Certified RUC | A resource that can participate in RUC market. Currently all PGA resources can participate in the RUC market. The acceptable values are 'YES' or 'NO'. | CERT_RUC [AT] | No | No | m:ResourceCertification/m:certifiedRUC | string |

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| Fuel Region Type | The area of the state where the Generator lies - used for Gas-fired and Coal Generators. | FUEL_REGN_TY PE [K] | No | No | m:FuelRegion/m:fuelRegionType | string |
| MSG Resource Flag | Indicates whether this is an MSG (Multi-Stage Generator) Resource. The acceptable values are 'YES' or 'NO'. | MSG_YN [BN] | No | No | | string |
| Startup Ramp Time | The startup ramp time, this attribute has been added for non-MSG resources. Even though it is modeled as a float, values will be rounded by normal rounding rules. | STARTUP_RAM P_TIME [BO] | No | No | | float |
| Supplied Configuration Flag | This flag is used for MSG and indicates whether a configuration has been supplied by the MP. The acceptable values are 'YES' or 'NO'. If 'NO', then the configuration values will be calculated | SUPPLIED_CON FIG_YN [BP] | No | No | | string |
| Hourly Predispatch Flag | Indicates need to dispatch before the start of the operating hour. Only relevant in Real-Time Market. | HR_PRE_DISP [BQ] | No | Yes | m:hourlyPredispatch | string |
| CertifiedBlackStart | BlackStartCertification: Y: Certified for Black Start; N: Not Certified for Black Start; Will be null for non-Generators | CERT_BLKSTRT [AQ] | No | No | m:ResourceCertification/m:certifiedBlackStart | string |
| Certified DAM | Certified for Day-Ahead Market | CERT_DAM [AR] | No | No | m:ResourceCertification/m:certifiedDAM | string |
| Certified RTM | Certified for Real-Time Market | CERT_RTM [AS] | No | No | m:ResourceCertification/m:certifiedRTM | string |

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| NGR | Indicates a non-generator resource that can operate as either Gen or Load. The acceptable values are 'YES' or 'NO'. | NGR [BR] | No | No | m:NGResourceFlag | String |
| REM | Indicates an NGR resource electing Regulation Energy Management (REM) and can only provide Regulation service. The acceptable values are 'YES' or 'NO'. | REM [BS] | No | Yes | m:REMFlag | string |
| Minimum Continuous Energy Limit | The minimum energy (MWh) that the LESR device can store. | MIN_CONT_ENERGY_LIMIT [BT] | No | Yes | m:minContinuousEnergyLimit | float |
| Maximum Continuous Energy Limit | The maximum energy (MWh) that the LESR device can store. | MAX_CONT_ENERGY_LIMIT [BU] | No | Yes | m:maxContinuousEnergyLimit | float |
| Curtailment Energy Limit | The maximum reduction of energy consumption (MWh) that the DDR device can incur. | CURT_ENERGY_LIMIT [BV] | No | Yes | m:curtailmentEnergyLimit | float |
| Energy Efficiency | Percent of charging energy that the device can discharge. | ENERGY_EFFIC [BW] | No | Yes | m:energyEfficiency | float |
| Combined Heat and Power Resource | Identifies resource that has been approved as Combined Heat and Power resource (producing electric energy and forms of useful thermal energy). | CHP [BX] | No | No | m:CHPResourceFlag | String |
| RMT Max On Peak | RMTG <i>On Peak</i> capacity value | RMT_MAX_ON_PEAK [BY] | No | No | /RegulatoryMustTakeGeneration/RMTGCapacity/value where /RegulatoryMustTakeGeneration/RMTGCapacityType='RMTMaxOnPeak' | Float |

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| RMT On Peak Expiration Date | Due date by when RMTG <i>On Peak</i> capacity value must be renewed. | RMT_MAX_ON_PEAK_EXP_DT [BZ] | No | No | /RegulatoryMustTakeGeneration/RMTGCapacity/RMTGCapacityExpDate where /RegulatoryMustTakeGeneration/RMTGCapacityType= RMTMaxOnPeak | Date |
| RMT Max Off Peak | RMTG <i>Off Peak</i> capacity value | RMT_MAX_OFF_PEAK [CA] | No | No | /RegulatoryMustTakeGeneration/RMTGCapacity/value where /RegulatoryMustTakeGeneration/RMTGCapacityType= RMTMaxOffPeak | Float |
| RMT Off Peak Expiration Date | Due date by when RMTG <i>Off Peak</i> capacity value must be renewed. | RMT_MAX_OFF_PEAK_EXP_DT [CB] | No | No | /RegulatoryMustTakeGeneration/RMTGCapacity/RMTGCapacityExpDate where /RegulatoryMustTakeGeneration/RMTGCapacityType= RMTMaxOffPeak | Date |
| Emission Rate | Factor was used by CARB to determine resource's obligation for compliance with CA Greenhouse Gas Emission Cap-and-Trade program. | EMISSION_RATE [CC] | No | Yes | m:GHGEmissionFactor | Float |
| Green House Gas Compliance Obligation | Identifies a resource that has obligation to comply with CA Greenhouse Gas Emission Cap-and-Trade program. | GHG_COMPLIANCE_OBLIG [CD] | No | Yes | m:GHGComplianceObligFlag | string |

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| Min Load Major Maintenance Adder | This is a fixed adder which modifies the proxy minimum load in order to account for major maintenance expenses. | ADDER_AMT [CE] | No | No | m:minLoadMMA | Float |
| Variable Energy Resource Flag | Variable Energy Resource (VER) identification flag: Y It is a VER ; N: It is not a VER. If no data, it is assumed to not be a VER | VER [CF] | No | Yes | m:VERFlag | string |
| Forecast Selection | Variable energy resource forecast selection | FORECAST_SELECTION [CG] | No | Yes | m:ForecastSelection | string |
| Energy Imbalance Market Participating Flag | Energy Imbalance Market (EIM) participation flag. Identifies if the resource is participating in the EIM. | EIM_PARTICIPATING [CH] | No | No | m:EIMParticipationFlag | string |
| Balancing Authority Area | The Balancing Authority Area to which the resource belongs. | BAA [CI] | No | No | m:HostControlArea/m:mrid | string |
| O&M Adder Type | Identifies the type of Operating Maintenance Cost. Valid Types are D (Default) and N (Negotiated). | OPER_MAINT_ADDER_TYPE [BF] | No | No | m:operatingMaintenanceCostType | string |
| Regulation Segments (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:RegulatingLimit/ | |
| High Limit Value | Higher level of the Regulation Range. | Higher MW for Regulation [E] | No | Yes | m:highLimit/m:value | float |

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| High Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:highLimit/m:units | string |
| Low Limit Value | Lower level of the Regulation Range. | Lower MW for Regulation [D] | No | Yes | m:lowLimit/m:value | float |
| Low Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:lowLimit/m:units | string |
| Segment Number | Number of the regulation range. Up to two segments allowed. If two are submitted, then segment number 1 must describe the lower range and segment number 2 must describe the upper range. | Segment Number [C] | Yes | Yes | m:segmentNumber | Integer |
| <u>Forbidden</u> Region Segments (0 to unbounded) (Usually 2 regions max) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:ForbiddenRegion/ | |
| Crossing Time | The time a generator needs to move through the Forbidden Region. | Forbidden Region Crossing Time [F] | No | Yes | m:crossTime | integer |

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| High MW | The upper MW output of the forbidden region of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: Forbidden regions cannot include nor overlap regulation ranges or heat segments. | Upper MW of Forbidden Region [E] | No | Yes | m:highMW | float |
| Low MW | The lower MW output of the forbidden range of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: forbidden regions cannot include nor overlap regulation ranges or heat segments. | Lower MW of Forbidden Region [D] | No | Yes | m:lowMW | float |
| Segment Number | This number represents a given forbidden region. Segment number 1 should be the forbidden region at the lowest level in the operating range. Segment numbers should correspond to sequential regions along the operating range, ending with segment (n) at the highest operating level. Up to four (4) segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Ramp Rates (0 to unbounded) (Usually max is 3, one for each ramp rate type) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:RampRateCurve/ | |

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| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Ramp MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Ramp Min Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Ramp Max Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |

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| Ramp Rate Type | The legitimate values are as follows: OP – Operational Ramp Rate REG – Regulation Ramp Rate OP_RES – Operating Reserve Ramp Rate | Based on the sheet name OP =RAMPRATE Sheet REG =REGRAMP Sheet OP_RES =OPERES RAMP Sheet | Yes | Yes | m:rampRateType | string |
| Individual Ramp Rate Data (0 to unbounded) Substitute Ramp Rate Type for 'XX' to retrieve values by type | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:RampRateCurve[m:rampRateType='XX']/m:CurveScheduleDatas/ | |
| Ramp MW Output Value | The Generating Unit MW output of point i. The first point (1) of MW output must begin at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMax. This field only applies to ramp rate type "OP". Other types ("REG" and "OP_RES") should not include this field. | Operating Level [D] | Yes | Yes | m:xAxisData | float |
| Ramp Min Rate Value | The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1). The minimum ramp rate of the last point should = the previous one. This requires providing the minimum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Worst Operational Ramp Rate [E] | No | Yes | m:y1AxisData | float |

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| Ramp Max Rate Value | The maximum ramp rate under the best operating condition of the Generating Unit between point (i) and the point (i+1). The maximum ramp rate of the last point should = the previous one. This requires providing the maximum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Best Operational Ramp Rate [F] | No | Yes | m:y2AxisData | float |
| Segment Number | Point numbers between the PMin and PMax of the Generating Unit output. The point numbering starts at 1. Up to 5 points allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Heat Rate – Heat Rate Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:HeatRate Curve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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| Heat Heat Rate Units | This field is not used. The assumed unit of measure is BTU/KW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Heat Emission Rate Units | This field is not used. The assumed unit of measure is lbs of NOx/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |
| Heat Rate Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:HeatRateCurve/m:CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |

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| Heat – Heat Rate Value | For gas-fired units only, the average heat rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If not a gas-fired unit, leave blank and <u>instead</u> complete the Average Heat Cost field. | Heat Rate [E] | No | Yes | m:y1AxisData | float |
| Heat Emission Rate Value | The emission rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). | Heat Emission Rate [F] | No | Yes | m:y2AxisData | float |
| Segment Number | <p>The point numbers between the PMin and PMax of the Generating Unit output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p> <p>Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Heat - Fuel Cost Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:FuelCost Curve/ | |
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| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Average Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Fuel Cost Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:FuelCost Curve/m:CurveScheduleDatas/ | |

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| Heat MW Output Value | <p>The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed.</p> <p>Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |
| Average Cost Value | <p>Use this value for non-gas fired units instead of Heat Rate. The average cost of the Generating Unit on point (i) in \$. If value at point (i) is not available, linear interpolation can be used to approximate the value. Average cost must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If gas-fired, make sure to enter a value in Heat Rate and leave this field blank.</p> | Average Cost [G] | No | Yes | m:y1AxisData | float |

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| Segment Number | <p>The point numbers between the PMin and PMax of the Generating Unit output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p> <p>Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Time (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:StartupTimeCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Time data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:StartUpTimeCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >= .5, it will be rounded to the next whole minute. Downtime must be set to the same value for each element of a segment (Time, Fuel, Aux, and Energy) to ensure consistent startup data content. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

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| Startup Time Value | Startup Time is the time (in whole minutes) it takes a resource to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the Generating Unit (in minutes) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup time (in minutes) from cooling time (n) to infinity. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. | Start-Up Time [E] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Energy (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:StartUpEnergyCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |

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| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is MW/Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Energy data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:StartupEnergyCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

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| Startup Energy Value | The electrical power used by a Generating Unit during startup. The Generating Unit's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinite. | Start-Up Aux [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Fuel (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:StartUpFuelCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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| Startup Fuel Value Units | This field is not used. The assumed unit of measure is Million BTU. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Fuel data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:StartupFuelCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

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|--|---|-----------------------|-----|-----|--|---------|
| Startup Fuel Value | The fuel use (in mBTU per start) expected for the startup of a natural gas fired Generating Unit that has been off-line for a substantial period of time. The startup fuel of the Generating Unit (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinite. | Start-Up Fuel [H] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup – Cost (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:StartupCostCurves/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Cost data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:StartupCostCurves/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >= .5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |
| Startup Cost Value | The startup cost of non-natural gas fired Generating Units (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. | Start-Up Cost [F] | No | Yes | m:y1AxisData | float |

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| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Startup Major Maintenance Adder | The Major Maintenance Adder (MMA) provides for the definition of a cost adder curve used as an overlay to the initial StartUpCostCurve to account for major maintenance expenses | Start-Up MMA [I] | No | No | m:AdderCurve | float |
| MSG Configurations – configurations (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:Configuration/ | |
| Configuration Name | Describes the configuration from a human readable point of view | CONFIG_NAME [C] | No | Yes | m:name | |
| Configuration ID | Must be unique within the MSG Resource | On MSG_CONFIG Sheet – CONFIG_ID [B] | Yes | No | m:mrid | string |
| Startup Code Type | Startup Code Type usually 'FAST' or null | STARTUP_CD_TYPE [N] | No | Yes | m:LogicalGenerator/startUpCodeType | string |
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| Maximum Generation | Maximum generation for this configuration. This value must be < = to Maximum Generation of its parent resource. | MAX_GEN [D] | Yes | Yes | m:LogicalGenerator/m:maximumOperatingMW/m:value | Float |
| Minimum Generation | Minimum generation for this configuration. This value must > = to the minimum generation of its parent resource. | MIN_GEN [E] | Yes | Yes | m:LogicalGenerator/m:minimumOperatingMW/m:value | Float |
| Minimum Load Cost | Minimum load cost for this configuration. | MIN_LOAD_COST [H] | Yes | Yes | m:LogicalGenerator/m:minLoadCost/m:value | Float |
| Minimum Off Time | Minimum off time for this configuration, this is when its down what's the minimum time before you can restart | MIN_OFF [G] | No | Yes | m:LogicalGenerator/m:minOffTime/m:value | Float |
| Minimum On Time | Minimum on time that a configuration once started must run for. | MIN_ON [F] | No | Yes | m:LogicalGenerator/m:minOnTime/m:value | Float |
| Startup Ramp Time | Startup Ramp Time | STARTUP_RAMP_TIME [L] | No | No | m:LogicalGenerator/m:StartUpRampTime | Float |
| Startup Flag | Whether Combined Cycle Plant can be started in this Logical Configuration. The acceptable values are 'YES' or 'NO'. | STARTUP_YN [K] | Yes | Yes | m:LogicalGenerator/m:startUpFlag | string |
| Shutdown Flag | Can you shutdown from this configuration? The acceptable values are 'YES' or 'NO'. | SHUTDOWN_YN [L] | Yes | Yes | m:LogicalGenerator/m:shutDownFlag | String |

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| Reserve Capacity Non-Spinning | The amount of reserve capacity available in non-spinning mode. | RSRV_CAP_N SPIN [J] | No | Yes | m:LogicalGenerator/ m:ResourceCapacity[m:capacityType='NR']/ m:defaultCapacity/m:value | Float |
| Reserve Capacity Spinning | The amount of reserve capacity available in spinning mode | RSRV_CAP_S PIN [I] | No | Yes | m:LogicalGenerator/ m:ResourceCapacity[m:capacityType='SR']/ m:defaultCapacity/m:value | Float |
| Certified for Non Spin DAM (Day Ahead Market) | Configuration is certified for Non-Spinning DAM (Day Ahead Market). The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_ DAM [R] | Yes | Yes | m:LogicalGenerator/m:ResourceCertificatio n/m:certifiedNonspinDAM | string |
| Certified for Non-Spin RTM (Real Time Market) | Configuration is certified for Non-Spinning RTM (Real Time Market). The acceptable values are 'YES' or 'NO'. | CERT_NSPIN_ RTM [S] | Yes | Yes | m:LogicalGenerator/m:ResourceCertificatio n/m:certifiedNonspinRTM | string |
| Certified for Regulation Down | Configuration is certified for Regulation Down. The acceptable values are 'YES' or 'NO'. | CERT_REG_D OWN [O] | Yes | Yes | m:LogicalGenerator/m:ResourceCertificatio n/m:certifiedRegulationDown | string |
| Certified for Regulation Up | Configuration is certified for Regulation Up. The acceptable values are 'YES' or 'NO'. | CERT_REG_U P [P] | Yes | Yes | m:LogicalGenerator/m:ResourceCertificatio n/m:certifiedRegulationUp | string |
| Certified for Spin | Configuration is certified for Spinning. The acceptable values are 'YES' or 'NO'. | CERT_SPIN [Q] | Yes | Yes | m:LogicalGenerator/m:ResourceCertificatio n/m:certifiedSpin | String |
| Min Load Major Maintenance Adder | This is a fixed adder which modifies the proxy minimum load in order to account for major maintenance expenses. | ADDER_AMT [T] | No | No | m:LogicalGenerator/m:minLoadMMA | float |

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| RA Range Min | Together with RARangeMax, used to determine the default RA Provider (configuration) based on RA value; null means configuration will not be a default provider | MIN_RA_LIMIT [U] | No | Yes | m:LogicalGenerator/m:RARangeMin | float |
| RA Range Max | Together with RARangeMin, used to determine the default RA Provider (configuration) based on RA value; null means configuration will not be a default provider | MAX_RA_LIMIT [V] | No | Yes | m:LogicalGenerator/m:RARangeMax | float |
| Configuration - Regulation Segments (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:LogicalGenerator/m:RegulatingLimit/ | |
| High Limit Value | Higher level of the Regulation Range. | Higher MW for Regulation [E] | No | Yes | m:highLimit/m:value | float |
| High Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:highLimit/m:units | string |
| Low Limit Value | Lower level of the Regulation Range. | Lower MW for Regulation [D] | No | Yes | m:lowLimit/m:value | float |

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|---|---|-----------------------|-----|-----|---|---------|
| Low Limit Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:lowLimit/m:units | string |
| Segment Number | Number of the regulation range. Up to two segments allowed. If two are submitted, then segment number 1 must describe the lower range and segment number 2 must describe the upper range. | Segment Number [C] | Yes | Yes | m:segmentNumber | Integer |
| <u>Configuration - Ramp Rates</u> (0 to unbounded) (Usually max is 3, one for each ramp rate type) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:LogicalGenerator/m:RampRateCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Ramp MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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| Ramp Min Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Ramp Max Rate Units | This field is not used. The assumed unit of measure is MW/Minute. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |
| Ramp Rate Type | The legitimate values are as follows: OP – Operational Ramp Rate REG – Regulation Ramp Rate OP_RES – Operating Reserve Ramp Rate | Based on the sheet name OP =RAMPRATE Sheet REG =REGRAMP Sheet OP_RES =OPERRES RAMP Sheet | Yes | Yes | m:rampRateType | string |
| Individual Ramp Rate Data (0 to unbounded) Substitute Ramp Rate Type for 'XX' to retrieve values by type | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:LogicalGenerator/m:RampRateCurve[m:rampRateType='XX'] /m:CurveScheduleDatas/ | |

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| Ramp MW Output Value | The Generating Unit MW output of point i. The first point (1) of MW output must begin at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMax. This field only applies to ramp rate type "OP". Other types ("REG" and "OP_RES") should not include this field. | Operating Level [D] | Yes | Yes | m:xAxisData | float |
| Ramp Min Rate Value | The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1). The minimum ramp rate of the last point should = the previous one. This requires providing the minimum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Worst Operational Ramp Rate [E] | No | Yes | m:y1AxisData | float |
| Ramp Max Rate Value | The maximum ramp rate under the best operating condition of the Generating Unit between point (i) and the point (i+1). The maximum ramp rate of the last point should = the previous one. This requires providing the maximum ramp rate of the first point (1) at PMin and last point (n) at PMax. | Best Operational Ramp Rate [F] | No | Yes | m:y2AxisData | float |
| Segment Number | Point numbers between the PMin and PMax of the Generating Unit output. The point numbering starts at 1. Up to 5 points allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |

| Configuration - Heat Rate – Heat Rate Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:LogicalGenerator/m:HeatRateCurve/ | |
|---|---|-----|----|-----|--|--------|
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Heat Heat Rate Units | This field is not used. The assumed unit of measure is BTU/KW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Heat Emission Rate Units | This field is not used. The assumed unit of measure is lbs of NOx/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y2AxisUnits | string |

| Heat Rate Curve Data (0 to unbounded) | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:LogicalGenerator/m:HeatRateCurve/m:CurveScheduleData/ | | |
|---------------------------------------|--|----------------------------------|----|---|--------------|-------|
| Heat MW Output Value | <p>The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed.</p> <p>Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired.</p> | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |
| Heat – Heat Rate Value | <p>For gas-fired units only, the average heat rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If not a gas-fired unit, leave blank and <u>instead</u> complete the Average Heat Cost field.</p> | Heat Rate [E] | No | Yes | m:y1AxisData | float |

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| Heat Emission Rate Value | The emission rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). | Heat Emission Rate [F] | No | Yes | m:y2AxisData | float |
| Segment Number | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Heat - Fuel Cost Curve (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:LogicalGenerator/m:FuelCostCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |

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| Heat MW Output Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Average Cost Units | This field is not used. The assumed unit of measure is \$/MW Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Fuel Cost Curve Data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRcord/m:RegisteredGenerator/m:LogicalGenerator/m:FuelCostCurve/m:CurveScheduleDatas/ | |
| Heat MW Output Value | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Heat Rate Operating Level [D] | No | Yes | m:xAxisData | float |

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| Average Cost Value | Use this value for non-gas fired units instead of Heat Rate. The average cost of the Generating Unit on point (i) in \$. If value at point (i) is not available, linear interpolation can be used to approximate the value. Average cost must be provided at the first point (1) (PMin), the last point (n) (PMax), and all points at the top and bottom of Forbidden Regions (if applicable). If gas-fired, make sure to enter a value in Heat Rate and leave this field blank. | Average Cost [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The point numbers between the PMin and PMax of the Generating Unit output. The point starts at 1. Up to 11 points are allowed. Note: The Heat Rate, Emission Rate, and Average Cost must include the data at the bottom and top of each Forbidden Region and exclude the data within the Forbidden Region. Must provide either Heat Rate data if gas fired, or Average Cost data if non-gas fired. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| <u>Configuration - Startup – Time</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:StartUpTimeCurve/ | |

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| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Time data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:StartupTimeCurve/ m:CurveScheduleDatas/ | |

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|--------------------------------|--|--|-----------|------------|--------------------|--------------|
| <p>Startup Down Time Value</p> | <p>The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. Downtime must be set to the same value for each element of a segment (Time, Fuel, Aux, and Energy) to ensure consistent startup data content. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements.</p> | <p>Registered Cooling Time [D]</p> | <p>No</p> | <p>Yes</p> | <p>m:xAxisData</p> | <p>float</p> |
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|--|---|-----------------------|-----|-----|---|---------|
| Startup Time Value | Startup Time is the time (in whole minutes) it takes a resource to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the Generating Unit (in minutes) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup time (in minutes) from cooling time (n) to infinity. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. | Start-Up Time [E] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Configuration - Startup – Energy (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDTRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartUpEnergyCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |

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| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is MW/Hour. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Energy data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartupEnergyCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

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|---|---|-----------------------|-----|-----|--|---------|
| Startup Energy Value | The electrical power used by a Generating Unit during startup. The Generating Unit's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinite. | Start-Up Aux [G] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| <u>Configuration - Startup – Fuel</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:StartUpFuelCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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|------------------------------------|---|--------------------------------|----|-----|--|--------|
| Startup Fuel Value Units | This field is not used. The assumed unit of measure is Million BTU. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Fuel data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartupFuelCurve/ m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [D] | No | Yes | m:xAxisData | float |

| | | | | | | |
|--|---|-----------------------|-----|-----|---|---------|
| Startup Fuel Value | The fuel use (in mBTU per start) expected for the startup of a natural gas fired Generating Unit that has been off-line for a substantial period of time. The startup fuel of the Generating Unit (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinite. | Start-Up Fuel [H] | No | Yes | m:y1AxisData | float |
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). | Segment Number [C] | Yes | Yes | m:segmentNumber | integer |
| Configuration - Startup - Cost (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:L ogicalGenerator/m:StartUpCostCurve/ | |
| Description | This field is not used. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:description | string |
| Startup Down Time Units | This field is not used. The assumed unit of measure is Minutes. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:xAxisUnits | string |

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|------------------------------------|---|-----------------------------|----|-----|---|--------|
| Startup Time Min Rate Units | This field is not used. The assumed unit of measure is \$. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:y1AxisUnits | string |
| Startup Cost data (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:LogicalGenerator/m:StartupCostCurve/m:CurveScheduleDatas/ | |
| Startup Down Time Value | The amount of time the Generating Unit must be off (in whole minutes) within sequence (i). The first down time must be zero to account for a unit that has just shut down. Even though the data type is float, an integer value is expected. Decimal values will be rounded. If the decimal portion is <.5, it shall be truncated. If the decimal portion is >=.5, it will be rounded to the next whole minute. If the same value is NOT entered for each element of the segment, the value provided for Energy will be used for all other elements. | Registered Cooling Time [E] | No | Yes | m:xAxisData | float |
| Startup Cost Value | The startup cost of non-natural gas fired Generating Units (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. | Start-Up Cost [G] | No | Yes | m:y1AxisData | float |

| | | | | | | |
|-------------------------------------|---|---|-----|-----|---|---------|
| Segment Number | The segment numbers corresponding to cooling time of the unit. The segment starts at 1. Normally, there are 3 segments (hot, warm and cold). Up to 9 segments are allowed. | Segment Number [D] | Yes | Yes | m:segmentNumber | integer |
| Startup Major Maintenance Adder | The Major Maintenance Adder (MMA) provides for the definition of a cost adder curve used as an overlay to the initial StartUpCostCurve to account for major maintenance expenses | Start-Up MMA [J] | No | No | m:AdderCurve | float |
| Transitions (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRD TRecord/m:RegisteredGenerator/m:T ransition/ | |
| From Configuration ID | A transition connects two configurations, the relationship(transition) is directional. This element represents the starting configuration of the transition. It is possible for each configuration to connect to 0 to many other configurations. | TRANSITION Sheet CONFIG_ID_FROM [B] | Yes | Yes | m:FromConfiguration/mrid | string |
| To Configuration ID | A transition connects two configurations, the relationship(transition) is directional. This element represents the ending configuration of the transition. It is possible for each configuration be connected to by 0 to many other configurations. | CONFIG_ID_TO [C] | Yes | Yes | m:ToConfiguration/mrid | string |
| Maximum Daily Transitions | Denotes the maximum number of times that this transition can be performed per day. | MAX_DAILY_TRANSITI ONS [G] | Yes | Yes | m:MaxDailyTransitions | Integer |

| | | | | | | |
|---|---|---------------------------------|-----|-----|--|---------|
| Notification Time | This is the amount of notification time needed before the transition can occur. | NOTIFICATION_TIME [F] | Yes | Yes | m:NotificationTime | Integer |
| Transition Cost | This is the actual cost of transition. | TRANSITION_COST [D] | Yes | Yes | m:TransitionCost | Float |
| Transition Ramp Time | This is how much time is needed to make this transition occur. | TRANSITION_RAMP_TIME [E] | Yes | Yes | m:TransitionRampTime | Integer |
| Transition Midpoint MW | The MW level of the midpoint for a transition | TRANSITION_MIDPOINT_MW [H] | No | Yes | m:transitionMidpointMW/m:value | float |
| Transition Midpoint Time | The time taken to reach the MW level of the midpoint for a transition | TRANSITION_MIDPOINT_TIME [I] | No | Yes | m:transitionMidpointTime | Integer |
| | | | | | | |
| Transition Comment | User Comment on the transition | TRANSITION_COMMENT [J] | | | | string |
| <u>Aggregate Physical Gen Units</u> (0 to unbounded) | | | | | //m:MessagePayload/m:MasterFileRDRecord/m:RegisteredGenerator/m:GeneratingUnit/ | |

| | | | | | | |
|----------------------------|---|-----------------|-----|-----|------------------------------|--------|
| Mrid | The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes. This is the Resource ID of the physical generating unit. | RES_ID [C] | Yes | No | m:mrid | string |
| Name | Descriptive name for the Resource. This is the Resource Name of the physical generating unit. | RES_NAME [D] | Yes | No | m:name | string |
| Maximum Operating MW Value | This is the maximum operating MW limit the dispatcher can enter for this unit. This is the Max Gen of the physical generating unit. | MAX_GEN [E] | Yes | No | m:maximumOperatingMW/m:value | float |
| Maximum Operating MW Units | This field is not used. The assumed unit of measure is MW. This field is included in the format definition specified in the CIM (Common Information Model), an industry standard format, but is not used in this application. | n/a | No | n/a | m:maximumOperatingMW/m:units | string |

6.8.2 Schema

6.8.2.1 GeneratorRDT_v4.xsd

6.8.3 Example XML File (GeneratorRDTEExample.xml)

Click on this link [Example XML File \(GeneratorRDTEExample.xml\)](#) to see a sample xml.

6.9 Fault Return

6.9.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|----------------------|--------------------------------|---------------------------|-------|---------------------------------------|----------|
| | | | | <i>//m:outputDataType/m:EventLog/</i> | |
| Id | Event log identifier. | N/A | No | m:id | string |
| Name | Event log name. | N/A | No | m:name | string |
| description | Event log description. | N/A | No | m:description | string |
| Type | Event log type. | N/A | No | m:type | string |
| Creation Time | Event log creation time. | N/A | No | m:creationTime | date |
| Collection Type | Event log collection type. | N/A | No | m:collectionType | string |
| Collection Quantity | Event log collection quantity. | N/A | No | m:collectionQuantity | string |
| Event Result | Event result. | N/A | Yes | m:Event/m:result | string |
| Event id | Event identifier. | N/A | No | m:Event/m:id | string |
| Event Name | Event name. | N/A | No | m:Event/m:name | string |
| Event Description | Event description. | N/A | No | m:Event/m:description | string |
| Event. Creation Time | Event creation time. | N/A | No | m:Event/m:creationTime | dateTime |
| Event Severity | Event severity. | N/A | No | m:Event/m:severity | string |
| Event Priority | Event priority. | N/A | No | m:Event/m:priority | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-----------------------|------------------------|---------------------------|-------|--------------------------|--------|
| Event Sequence Number | Event sequence number. | N/A | No | m:Event/m:sequenceNumber | string |
| Event EventType | Event type. | N/A | No | m:Event/m:eventType | string |
| Service Id | Service identifier. | N/A | Yes | m:Service/m:id | string |
| Service Name | Service name. | N/A | Yes | m:Service/m:name | string |
| Service Description | Service description. | N/A | Yes | m:Service/m:description | string |
| Service Comments | Service comments. | N/A | Yes | m:Service/m:comments | string |

6.9.2 Schema

6.9.2.1 StandardOutput.xsd

6.9.3 Example XML File (StandardOutput.xml)

```

<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
    <m:description>The Event Description</m:description>
    <m:type>Error Event</m:type>
    <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
    <m:collectionType>Retrieve Generator RDT</m:collectionType>
  </m:EventLog>
</m:outputDataType>

```



```
<m:collectionQuantity>1</m:collectionQuantity>
<m:Event>
  <m:result>Invalid Value Found in Field XX</m:result>
  <m:id>1234</m:id>
  <m:name>Error Event 1234</m:name>
  <m:description>An invalid data value was found</m:description>
  <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
  <m:severity>High</m:severity>
  <m:priority>High</m:priority>
  <m:sequenceNumber>1</m:sequenceNumber>
  <m:eventType>Initiated by MF API</m:eventType>
</m:Event>
<m:Service>
  <m:id>1234567</m:id>
  <m:name>Retrieve Generator RDT</m:name>
  <m:description>Having problems - Invalid data has been found</m:description>
  <m:comments>Some one needs to fix the data</m:comments>
</m:Service>
</m:EventLog>
</m:outputDataType>
```

7 Retrieve RDT Batch Submission Status

7.1 Business Scenario

Scheduling Coordinators retrieves the status of all submitted batches for the specified SC ID. This is a useful tool to acquire the status of all of an SC's submissions in one request.

7.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|--|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | 8k bytes average to 1MB bytes (based on one batch per resource with 1500 resources total) maximum. |
| Expected frequency (average and maximum) | Average of 10 and maximum of 300 status retrievals per day. |
| Longest time the service can be unavailable before business is impacted | One Day |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not be able to retrieve the latest values of their Data. They would not be able to confirm that the resources that are scheduled have the correct or latest data. This is a read only transaction. |
| Expected response time for the service | 60 Seconds |

7.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Retrieve messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a RetrieveRDTSubmissionStatus service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes a request to Master File with a valid SC ID by invoking the Retrieve Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator provides criteria to find the status of all batches that have been submitted by an SC ID.
- 2) Scheduling Coordinator validates the data set based on the XML schema.
- 3) Scheduling Coordinator invokes the RetrieveRDTSubmissionStatus web service in order to retrieve the latest status for each batch.
- 4) The Master File system returns the requested payload that contains a list of all batch submission statuses for one SC ID.

There is one web service involved: ***RetrieveRDTSubmissionStatus***

7.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|-----------------------------|---------------|-----------------------------|----------------------------------|--------------------------------|
| retrieveRDTSUBMISSIONSTATUS | Input | RetrieveRDTSUBMISSIONSTATUS | retrieveRDTSUBMISSIONSTATUS.wsdl | RequestRDTSUBMISSIONSTATUS.xsd |
| | Output | RDTSUBMISSIONBATCH | | RDTSUBMISSIONSTATUS.xsd |
| | Fault | FAULTRETURNTYPE | | StandardOutput.xsd |

7.4.1 Operation Details – WSDL URLs

Production Environment - TBD

7.5 WSDL (*retrieveRDTSUBMISSIONSTATUS.wsdl*)

7.6 Request RDT Submission Status

The attachment information schema, RequestRDTSUBMISSIONSTATUS.xsd, is used to provide the criteria necessary to search for RDT Submission Status Information.

7.6.1 Element table

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---------|------------------|--------------------------|-------|-------------------------------|------|
| | | | | //RequestRDTSUBMISSIONSTATUS/ | |

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---------------------------|---------------------------|--------------------------|-------|-----------------------|--------|
| Scheduling Coordinator ID | Scheduling Coordinator ID | n/a | Yes | schedulingCoordinator | string |

7.6.2 Schema

7.6.2.1 RequestRDTSubmissionStatus.xsd

7.6.3 Example XML File (RequestRDTSubmissionStatusExample.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<RequestRDTSubmissionStatus xsi:schemaLocation="http://www.caiso.com/soa/2008-08-09/RequestRDTSubmissionStatus.xsd
RequestRDTSubmissionStatus.xsd" xmlns="http://www.caiso.com/soa/2008-08-09/RequestRDTSubmissionStatus.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <schedulingCoordinator>ABCD</schedulingCoordinator>
</RequestRDTSubmissionStatus>
```

7.7 Retrieve RDT Batch Submission Status Data

A list of RDT Submission Status information is returned when a Scheduling Coordinator is provided. An XML file with a batch of RDT changes is the output.

7.7.1 Element Table:

“RDT Batch Submission Status” is the name for the XML document that contains the output of the request for batch status information.

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|--|---|--------------------------|-------|--|--|
| Message Header Type | | | | //m:MessageHeader/ | |
| Time Date | The dateTime, in GMT, when the payload is published. | n/a | Yes | m:TimeDate | dateTime See Appendix 1 |
| Source | The source of published data. The value for this payload is CAISO. | n/a | No | m:Source | string |
| Version | Date reflecting the release this latest version update was related to. | N/A | Yes | | m:Version |
| Message Payload | | | | | |
| RDT Submission Batch Status Record Header | | | | //m:MessagePayload/m:RDTSubmissionStatusHdr/ | |
| Scheduling Coordinator Id | The scheduling coordinator id that all the batches were submitted for | n/a | No | m:SchedulingCoordinator/m:mrid | string |
| RDT Submission Batch Status Record | | | | //m:MessagePayload/m:RDTSubmissionStatusHdr/m:RDTSubmissionBatch/ | |
| Submission Date | The date the batch was submitted. The time component will be set using Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | No | m:submissionDate | dateTime See Appendix 1 |
| File Name | The name of the file that was uploaded to the Master File System | n/a | No | m:fileName | string |

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|----------------|--|--------------------------|-------|-----------------|--|
| Batch ID | The batch id that was assigned to the submission | n/a | Yes | m:batchID | string |
| Batch Status | The current status of the batch. Valid values are as follows: Request to Load – Waiting in Queue to Run In Process – Currently being processed Submitted – Batch successfully submitted Validation Error – Validation error found in submission. CAISO will communicate details. Approved – CAISO has approved batch Declined – Batch has been declined. CAISO will communicate details. | n/a | No | m:batchStatus | string |
| Status Date | The date the status changed last. The time component will be set using Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | No | m:statusDate | dateTime See Appendix 1 |
| Effective Date | The effective date of the batch submission. The time component will be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | No | m:EffectiveDate | dateTime See Appendix 1 |
| Submitter | The person who submitted the batch | n/a | No | m:submitter | string |

7.7.2 Schema

7.7.2.1 RDTSUBMISSIONSTATUS.XSD

7.7.3 Example XML File (RDTSUBMISSIONSTATUSEXAMPLE.XML)

NOTE: This is an example of the output produced by querying the RDT Submission Status for the specified SC ID

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<m:RDTSUBMISSIONSTATUS xsi:schemaLocation="http://www.aiso.com/soa/2008-08-09/RDTSUBMISSIONSTATUS.XSD
xfrm_RDTSUBMISSIONSTATUS.XSD" xmlns:m="http://www.aiso.com/soa/2008-08-09/RDTSUBMISSIONSTATUS.XSD"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:MessageHeader>
    <m:TimeDate>2001-12-17T09:30:47.0Z</m:TimeDate>
    <m:Source>String</m:Source>
  </m:MessageHeader>
  <m:MessagePayload>
    <m:RDTSUBMISSIONSTATUSHDR>
      <m:SchedulingCoordinator>
        <m:mrid>ABCD</m:mrid>
      </m:SchedulingCoordinator>
      <m:RDTSUBMISSIONBATCH>
        <m:submissionDate>2008-08-29T09:30:47.000-07:00</m:submissionDate>
        <m:fileName>ABCDGenWindRes.xls</m:fileName>
        <m:batchID>24456</m:batchID>
        <m:batchStatus>Submitted</m:batchStatus>
        <m:statusDate>2008-08-29T09:30:47.000-07:00</m:statusDate>
        <m:effectiveDate>2008-08-30T00:00:00.000-07:00</m:effectiveDate>
        <m:submitter>SCs Name</m:submitter>
      </m:RDTSUBMISSIONBATCH>
    </m:RDTSUBMISSIONSTATUSHDR>
  </m:MessagePayload>
</m:RDTSUBMISSIONSTATUS>
</xml>
```



```

</m:RDTSUBmissionBatch>
<m:RDTSUBmissionBatch>
  <m:submissionDate>2008-09-17T09:30:47.000-07:00</m:submissionDate>
  <m:fileName>ABCDGenHydroRes</m:fileName>
  <m:batchID>0</m:batchID>
  <m:batchStatus>Validation Error</m:batchStatus>
  <m:statusCode>2008-09-17T09:30:47.000-07:00</m:statusCode>
  <m:effectiveDate>2008-09-17T00:00:00.000-07:00</m:effectiveDate>
  <m:submitter>ABCDSmitter 2</m:submitter>
</m:RDTSUBmissionBatch>
</m:RDTSUBmissionStatusHdr>
</m:MessagePayload>
</m:RDTSUBmissionStatus>

```

7.8 Fault Return

7.8.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-------------|------------------------|---------------------------|-------|---------------------------------------|--------|
| | | | | <i>//m:outputDataType/m:EventLog/</i> | |
| Id | Event log identifier. | n/a | No | m:id | string |
| Name | Event log name. | n/a | No | m:name | string |
| description | Event log description. | n/a | No | m:description | string |
| Type | Event log type. | n/a | No | m:type | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-----------------------|--------------------------------|------------------------------|-------|--------------------------|----------|
| Creation Time | Event log creation time. | n/a | No | m:creationTime | date |
| Collection Type | Event log collection type. | n/a | No | m:collectionType | string |
| Collection Quantity | Event log collection quantity. | n/a | No | m:collectionQuantity | string |
| Event Result | Event result. | n/a | Yes | m:Event/m:result | string |
| Event Id | Event identifier. | n/a | No | m:Event/m:id | string |
| Event Name | Event name. | n/a | No | m:Event/m:name | string |
| Event Description | Event description. | n/a | No | m:Event/m:description | string |
| Event Creation Time | Event creation time. | n/a | No | m:Event/m:creationTime | dateTime |
| Event Severity | Event severity. | n/a | No | m:Event/m:severity | string |
| Event Priority | Event priority. | n/a | No | m:Event/m:priority | string |
| Event Sequence Number | Event sequence number. | n/a | No | m:Event/m:sequenceNumber | string |
| Event Type | Event type. | n/a | No | m:Event/m:eventType | string |
| Service Id | Service identifier. | n/a | Yes | m:Service/m:id | string |
| Service Name | Service name. | n/a | Yes | m:Service/m:name | string |
| Service Description | Service description. | n/a | Yes | m:Service/m:description | string |
| Service Comments | Service comments. | n/a | Yes | m:Service/m:comments | string |

7.8.2 Schema

7.8.2.1 StandardOutput.xsd

7.8.3 Example XML File (StandardOutput.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
    <m:description>The Event Description</m:description>
    <m:type>Error Event</m:type>
    <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
    <m:collectionType>Retrieve RDT Batch Submission</m:collectionType>
    <m:collectionQuantity>1</m:collectionQuantity>
    <m:Event>
      <m:result>Invalid Value Found in Field XX</m:result>
      <m:id>1234</m:id>
      <m:name>Error Event 1234</m:name>
      <m:description>An invalid data value was found</m:description>
      <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
      <m:severity>High</m:severity>
      <m:priority>High</m:priority>
      <m:sequenceNumber>1</m:sequenceNumber>
      <m:eventType>Initiated by MF API</m:eventType>
    </m:Event>
  </m:Service>
```

```
<m:id>1234567</m:id>  
<m:name>Retrieve RDT Batch Submission</m:name>  
<m:description>Having problems - Invalid data has been found</m:description>  
<m:comments>Some one needs to fix the data</m:comments>  
</m:Service>  
</m:EventLog>  
</m:outputDataType>
```

8 Retrieve Approved Resource Changes

8.1 Business Scenario

Scheduling Coordinators retrieves a list of all resources with changes that are about to become effective within the specified date range based on SC ID. This is a useful tool to acquire all upcoming resource changes in one request.

8.2 Service Level Agreement

The following service level agreement defines the business and technical requirements for service availability and performance.

| | |
|--|--|
| Service availability | Service level goal is 99%. |
| Expected size of payload (average and maximum) | 8k bytes average to 1MB bytes (1500 resources total) maximum. |
| Expected frequency (average and maximum) | Average of 40 and maximum of 300 status retrievals per day. |
| Longest time the service can be unavailable before business is impacted | One Day |
| Business impact if is unavailable | Schedule Coordinators utilizing the service may not be able to retrieve the latest values of their Data. They would not be able to confirm that the resources that are scheduled have the correct or latest data. This is a read only transaction. |
| Expected response time for the service | 60 Seconds |

8.3 Use Model

The service interaction between Scheduling Coordinators and the Master File System is a synchronous submission process.

The data exchange follows CAISO SOA Retrieve messaging pattern. In this pattern, the data source system is the Scheduling Coordinator who initiates a data transaction by invoking a RetrieveApprovedResourceChanges service provided by Master File. The consumer of the Web service is Scheduling Coordinator or a Web portal. The consumer makes a request to Master File with date criteria and SC ID by invoking the RetrieveApprovedResourceChanges Web service. The Master File system is the provider of the Web service.

The following steps are involved in the submission process:

- 1) Scheduling Coordinator provides date criteria and SC ID to find all the resources that will become effective during the date range provided in the search criteria. There is a business constraint that the date range cannot exceed 30 days.
- 2) Scheduling Coordinator validates the data set based on the XML schema.
- 3) Scheduling Coordinator invokes the RetrieveApprovedResourceChanges web service in order to retrieve the resources that will become active within date range.
- 4) The Master File system returns the requested payload that contains a list of all resources for one SC ID that will become active in the supplied date range.

There is one web service involved: ***RetrieveApprovedResourceChanges***

8.4 Operation Details

The service has one operation with three message types. All input and output messages are in XML format.

| Operation | Message Types | Message | WSDL | XSD |
|---------------------------------|---------------|---|--------------------------------------|------------------------------------|
| retrieveApprovedResourceChanges | Input | RetrieveApprovedResourceChangesRequest | retrieveApprovedResourceChanges.wsdl | RequestApprovedResourceChanges.xsd |
| | Output | RetrieveApprovedResourceChangesResponse | | ApprovedResourceChanges.xsd |
| | Fault | FaultReturnTypes | | StandardOutput.xsd |

8.4.1 Operation Details – WSDL URLs

Production Environment - TBD

8.5 WSDL (*retrieveApprovedResourceChanges.wsdl*)

8.6 Request Approved Resource Changes

The attachment information schema, RequestApprovedResourceChanges.xsd, is used to provide the criteria necessary to search for Approved Resources that will become effective between the “From” and “Through” dates.

8.6.1 Element table

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---------------------------|---|--------------------------|-------|-----------------------------------|--|
| | | | | //RequestApprovedResourceChanges/ | |
| Scheduling Coordinator ID | Scheduling Coordinator ID | n/a | Yes | schedulingCoordinator | string |
| From Date | The begin of the date range used to search Effective Date. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). Data from the wrong date may be returned if time is not set to midnight. | n/a | Yes | fromStartEffectiveDate | dateTime See Appendix 1 |
| Through Date | The end of the date range used to search Effective Date. If this field is omitted, the Through Date will default to the From Date plus 7 days. The time component should be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). Data from the wrong date may be returned if time is not set to midnight. | n/a | No | throughStartEffectiveDate | dateTime See Appendix 1 |

8.6.2 Schema

8.6.2.1 RequestApprovedResourceChanges.xsd

8.6.3 Example XML File (RequestApprovedResourceChangesExample.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<RequestApprovedResourceChanges xsi:schemaLocation="http://www.caiso.com/soa/2008-08-10/RequestApprovedResourceChanges.xsd
RequestApprovedResourceChanges.xsd" xmlns="http://www.caiso.com/soa/2008-08-10/RequestApprovedResourceChanges.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <schedulingCoordinator>ABCD</schedulingCoordinator>
  <fromStartEffectiveDate>2008-12-12T00:00:00.000-08:00</fromStartEffectiveDate>
  <throughStartEffectiveDate>2008-12-18T00:00:00.000-08:00</throughStartEffectiveDate>
</RequestApprovedResourceChanges>
```

8.7 Retrieve Approved Resource Changes Data

A list of Approved Resource Changes information is returned when a Scheduling Coordinator and date range is provided. An XML file with the list of resources is the output.

8.7.1 Element Table:

“Approved Resource Changes” is the name for the XML document that contains the output of the request for batch status information.

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---------|------------------|-----------------------------|-------|-------|------|
|---------|------------------|-----------------------------|-------|-------|------|

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---|---|--------------------------|-------|--|--|
| Message Header Type | | | | //m:ApprovedResourceChanges/m:MessageHeader/ | |
| Time Date | The dateTime, in GMT, when the payload is published. | n/a | Yes | m:TimeDate | dateTime See Appendix 1 |
| Source | The source of published data. The value for this payload is CAISO. | n/a | No | m:Source | string |
| Message Payload | | | | | |
| Approved Resource Changes Record | | | | //m:ApprovedResourceChanges/m:MessagePayload/m:ApprovedResourceChangesRecord/ | |
| Submission Date | The date the batch was submitted. The time component will be set using Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | No | m:submissionDate | dateTime See Appendix 1 |
| File Name | The name of the file that was uploaded to the Master File System | n/a | No | m:fileName | string |
| Batch ID | The batch id that was assigned to the submission | n/a | No | m:batchID | string |
| Effective Date | The date that the change will become effective or active. The time component will be set to midnight Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | Yes | m:effectiveDate | dateTime See Appendix 1 |

| Element | Data Description | RDT XLS File [Column] | Req'd | XPath | Type |
|---------------|--|--------------------------|-------|----------------|--|
| Submitter | The person who submitted the last change | n/a | No | m:submitter | string |
| Resource ID | The Resource Id | n/a | No | m:resourceID | string |
| Resource Name | The Name of the Resource | n/a | Yes | m:resourceName | string |
| Resource Type | The resource type, i.e. GEN, LOAD, ITIE, ETIE, TG | n/a | Yes | m:resourceType | string |
| Approval Date | The date the change was approved by the CAISO business unit. The time component will be set using Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable). | n/a | Yes | m:approvalDate | dateTime See Appendix 1 |

8.7.2 Schema (ApprovedResourceChanges.xsd)

8.7.2.1 ApprovedResourceChanges.xsd

8.7.3 Example XML File (ApprovedResourceChangesExample.xml)

NOTE: This is an example of the output produced by querying the Retrieve Approved Resource Changes for the specified SC ID between specified dates.

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2007 rel. 3 sp1 (http://www.altova.com)-->
<m:ApprovedResourceChanges xsi:schemaLocation="http://www.caiso.com/soa/2008-08-09/ApprovedResourceChanges.xsd
ApprovedResourceChanges.xsd" xmlns:m="http://www.caiso.com/soa/2008-08-09/ApprovedResourceChanges.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:MessageHeader>
```

```
<m:TimeDate>2001-12-17T09:30:47.000-08:00</m:TimeDate>
<m:Source>API</m:Source>
</m:MessageHeader>
<m:MessagePayload>
  <m:ApprovedResourceChangesRecord>
    <m:submissionDate>2008-12-11T09:30:47.000-08:00</m:submissionDate>
    <m:fileName>ABCDBatchRes01013.xls</m:fileName>
    <m:batchID>154373</m:batchID>
    <m:effectiveDate>2008-12-18T00:00:00.000-08:00</m:effectiveDate>
    <m:submitter>ABCD_Resource_Specialist</m:submitter>
    <m:resourceID>Res01013</m:resourceID>
    <m:resourceName>Salamander Springs Generator 003</m:resourceName>
    <m:resourceType>GEN</m:resourceType>
    <m:approvalDate>2008-12-17T09:30:47.000-08:00</m:approvalDate>
  </m:ApprovedResourceChangesRecord>
  <m:ApprovedResourceChangesRecord>
    <m:submissionDate>2008-12-11T09:30:47.000-08:00</m:submissionDate>
    <m:fileName>ABCDBatchRes028545.xls</m:fileName>
    <m:batchID>158840</m:batchID>
    <m:effectiveDate>2008-12-18T00:00:00.000-08:00</m:effectiveDate>
    <m:submitter>ABCD_Resource_Specialist</m:submitter>
    <m:resourceID>Res028545</m:resourceID>
    <m:resourceName>Salamander Springs Generator 003</m:resourceName>
    <m:resourceType>GEN</m:resourceType>
    <m:approvalDate>2008-12-17T09:30:47.000-8:00</m:approvalDate>
  </m:ApprovedResourceChangesRecord>
</m:MessagePayload>
</m:ApprovedResourceChanges>
```

8.8 Fault Return

8.8.1 Element Table

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|---------------------|--------------------------------|------------------------------|-------|---------------------------------------|----------|
| | | | | <i>//m:outputDataType/m:EventLog/</i> | |
| Id | Event log identifier. | n/a | No | m:id | string |
| Name | Event log name. | n/a | No | m:name | string |
| description | Event log description. | n/a | No | m:description | string |
| Type | Event log type. | n/a | No | m:type | string |
| Creation Time | Event log creation time. | n/a | No | m:creationTime | date |
| Collection Type | Event log collection type. | n/a | No | m:collectionType | string |
| Collection Quantity | Event log collection quantity. | n/a | No | m:collectionQuantity | string |
| Event Result | Event result. | n/a | Yes | m:Event/m:result | string |
| Event Id | Event identifier. | n/a | No | m:Event/m:id | string |
| Event Name | Event name. | n/a | No | m:Event/m:name | string |
| Event Description | Event description. | n/a | No | m:Event/m:description | string |
| Event Creation Time | Event creation time. | n/a | No | m:Event/m:creationTime | dateTime |
| Event Severity | Event severity. | n/a | No | m:Event/m:severity | string |
| Event Priority | Event priority. | n/a | No | m:Event/m:priority | string |

| Element | Data Description | RDT XLS Field [Column] | Req'd | XPath | Type |
|-----------------------|------------------------|---------------------------|-------|--------------------------|--------|
| Event Sequence Number | Event sequence number. | n/a | No | m:Event/m:sequenceNumber | string |
| Event Type | Event type. | n/a | No | m:Event/m:eventType | string |
| Service Id | Service identifier. | n/a | Yes | m:Service/m:id | string |
| Service Name | Service name. | n/a | Yes | m:Service/m:name | string |
| Service Description | Service description. | n/a | Yes | m:Service/m:description | string |
| Service Comments | Service comments. | n/a | Yes | m:Service/m:comments | string |

8.8.2 Schema

8.8.2.1 StandardOutput.xsd

8.8.3 Example XML File (StandardOutput.xml)

```

<?xml version="1.0" encoding="UTF-8"?>
<m:outputDataType xsi:schemaLocation="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd StandardOutput.xsd"
xmlns:m="http://www.caiso.com/soa/2006-06-13/StandardOutput.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <m:EventLog>
    <m:id>Event-123</m:id>
    <m:name>Event Name</m:name>
    <m:description>The Event Description</m:description>
    <m:type>Error Event</m:type>
    <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
  </m:EventLog>
</m:outputDataType>

```

```
<m:collectionType>Retrieve Approved Resource Changes</m:collectionType>
<m:collectionQuantity>1</m:collectionQuantity>
<m:Event>
  <m:result>Invalid Value Found in Field XX</m:result>
  <m:id>1234</m:id>
  <m:name>Error Event 1234</m:name>
  <m:description>An invalid data value was found</m:description>
  <m:creationTime>2008-12-17T09:30:47.000-08:00</m:creationTime>
  <m:severity>High</m:severity>
  <m:priority>High</m:priority>
  <m:sequenceNumber>1</m:sequenceNumber>
  <m:eventType>Initiated by MF API</m:eventType>
</m:Event>
<m:Service>
  <m:id>1234567</m:id>
  <m:name>Retrieve Approved Resource Changes</m:name>
  <m:description>Having problems - Invalid data has been found</m:description>
  <m:comments>Some one needs to fix the data</m:comments>
</m:Service>
</m:EventLog>
</m:outputDataType>
```

Appendix 1– dateTime Data Type

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

The dateTime is specified in the following form "YYYY-MM-DDThh: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

Note: All components are required.

To specify a time zone, the time component will be set using Pacific Prevailing Time (Pacific Standard Time or Pacific Daylight Time, as applicable), for example:

```
<startdate>2009-05-30T00:00:00.000-7:00</startdate>
```


Appendix 2 – Getting Access to Master File API

Digital Certificate

A Digital Certificate must be obtained and installed before a user can access the Master File API for the first time.

Please submit your request utilizing the current Integration Application Request Form. The Integration Application Request Form can be found at the following link:

[Integration Application Access Request Form](#)

When requesting application access, please download the latest form from the website every time. The Integration Application Request Form continues to be very dynamic as new applications and environments are rolled out. By accessing the current form every time, you will be able to select from all the available applications and environments, and all the necessary information will be collected.

- **Fill out** the form following the instructions, as shown below.
- **Save** as an Excel file to your drive.
- **Email** the completed form to CertRequest@caiso.com

Certificate Installation

Once approved, Certificate Request replies via email with the Master File API certificate and password. A password is required for the initial installation of the certificate. All ensuing accesses automatically connect the user.

- **Save** the certificate file and installation PIN in a secure location for possible future use **and follow** the installation instructions.

Application Access

Access to the Master File API follows the same standards as existing CAISO market services. Client Development should follow similar patterns.

Staging Environment URL information will be posted 2 weeks prior to the start of testing. Production Environment URL information will be added to this document or posted at a later date.

