



Energy Efficiency Measures (EEM) Web Services Data Exchange Specification

Version 1.0

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ISO New England Inc.

Change Summary

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About this document

The Energy Efficiency Measures (EEM) Web Services Data Exchange Specification document describes the REST messages and the Authentication and Authorization process used to exchange energy efficiency measure data between a Lead Market Participant and EEM through the web service. This document explains how to access the EEM web service, lays out the format and construction of REST messages used to exchange data, and briefly describes the Authentication and Authorization methods used to ensure security.

This guide is designed to assist Lead Market Participants develop personal interfaces that interact and exchange energy efficiency measure data with the EEM web service. It will help Lead Market Participants comprehend and construct the energy efficiency measure data messages essential for data exchange with EEM.

Scope and prerequisite knowledge

This document is offered to ISO New England Lead Market Participants as an aid in developing new interfaces as well as assisting in the upgrade/re-design of existing interfaces. Users should be familiar with Extensible Markup Language (XML), Web Services, HTTP/HTTPS protocols, ISO New England's governing documents, business rules and operating procedures as well as have a working understanding of how the capacity market works for resources comprised of energy efficiency measures in New England. Refer to [References and Additional Information](#) for helpful links.

Structure of this document

- Section 1 gives an overview of the EEM web service including EEM web service design and access, EEM roles, and authentication and authorization.
- Section 2 describes REST operations and their construction.
- Section 3 explains the functionality of the REST operations available for exchanging energy efficiency measure data between a Lead Market Participant and EEM.

References and Additional Information

All of the data exchanges using the EEM web services are described by operations that are defined in the EEM WADL file: **application.wadl** and by types defined in the EEM XSD file: **eem.xsd**.

Additional information about Extensible Markup Language (XML), Web Services, and other helpful information can be found at the following web locations:

- XML –
 - <http://www.w3.org> > XML Technology
 - <http://www.w3schools.com> > Learn XML
- Web Services –
 - <http://www.w3.org> > Web Service Technology
 - <http://www.w3schools.com> > Learn Web Services
- REST –
 - <http://www.packetizer.com/ws/rest.html>

ISO New England governing documents include the Transmission, Markets & Services Tariff, ISO New England Manuals and Operating Procedures. They can be found at the following location:

- <http://www.iso-ne.com/participate/rules-procedures>

Table of Contents

1.	Web Service Overview	8
1.1	Web Service Design	8
1.2	Accessing the EEM Web Services	8
1.3	EEM Roles	9
2.	REST Messages	10
2.1	REST Operations Responses	10
2.2	Format and Construction	11
3.	Web Services	12
3.1	Customer Web Service	12
3.1.1	Purpose of Message	12
3.1.2	REST Endpoint	12
3.1.3	Request Method	12
3.1.4	Mandatory and Optional Fields	12
3.1.5	Sample Request	12
3.1.6	Data Returned	12
3.2	End Use Web Service	13
3.2.1	Purpose of Message	13
3.2.2	REST Endpoint	13
3.2.3	Request Method	13
3.2.4	Mandatory and Optional Fields	13
3.2.5	Sample Request	13
3.2.6	Data Returned	13
3.3	Lead Market Participant Web Service	13
3.3.1	Purpose of Message	13
3.3.2	REST Endpoint	14
3.3.3	Request Method	14
3.3.4	Mandatory and Optional Fields	14
3.3.5	Sample Request	14
3.3.6	Data Returned	14
3.4	All or Single Measure Web Service	14
3.4.1	Purpose of Message	14
3.4.2	REST Endpoint	14
3.4.3	Request Method	14
3.4.4	Mandatory and Optional Fields	14
3.4.5	Sample Request and Data Returned	15
3.5	Measure Detail Web Service	16
3.5.1	Purpose of Message	16
3.5.2	REST Endpoint	16
3.5.3	Request Method	16
3.5.4	Mandatory and Optional Fields	16
3.5.5	Sample Request	16
3.5.6	Data Returned	16
3.6	Measure Detail History Web Service	17
3.6.1	Purpose of Message	17

3.6.2	REST Endpoint	17
3.6.3	Request Method	17
3.6.4	Mandatory and Optional Fields	18
3.6.5	Sample Request	18
3.6.6	Data Returned	18
3.7	Pending Measure Details Web Service	20
3.7.1	Purpose of Message	20
3.7.2	REST Endpoint	20
3.7.3	Request Method	20
3.7.4	Mandatory and Optional Fields	20
3.7.5	Sample Request	20
3.7.6	Data Returned	20
3.8	Current and Pending Measure Detail Web Service	21
3.8.1	Purpose of Message	21
3.8.2	REST Endpoint	22
3.8.3	Request Method	22
3.8.4	Mandatory and Optional Fields	22
3.8.5	Sample Request	22
3.8.6	Data Returned	22
3.9	Create New Measure Detail Web Service	24
3.9.1	Purpose of Message	24
3.9.2	REST Endpoint	24
3.9.3	Request Method	24
3.9.4	Mandatory and Optional Fields	24
3.9.5	Additional Value Restrictions	26
3.9.6	Sample Request	29
3.9.7	Data Returned	29
3.10	Cancel Pending Measure Web Service	30
3.10.1	Purpose of Message	30
3.10.2	REST Endpoint	30
3.10.3	Request Method	30
3.10.4	Mandatory and Optional Fields	30
3.10.5	Sample Request	30
3.10.6	Data Returned	30
3.11	Update Measure Detail Web Service	31
3.11.1	Purpose of Message	31
3.11.2	REST Endpoint	31
3.11.3	Request Method	31
3.11.4	Mandatory and Optional Fields	31
3.11.5	Additional Value Restrictions	31
3.11.6	Sample Request	32
3.11.7	Data Returned	33
3.12	Search Specific Measure Detail Web Service	33
3.12.1	Purpose of Message	33
3.12.2	REST Endpoints	33
3.12.3	Request Method	33
3.12.4	Mandatory and Optional Fields	33
3.12.5	Sample Request	35
3.12.6	Data Returned	35

4.	Appendix A. Web Service Client – Java	37
4.1	Prerequisites for creating application code	37
4.2	Code Sample	37
5.	Customer Support	43
5.1	By Internet	43
5.2	By Telephone	43
5.3	By Email	44
5.4	Ask ISO	44
6.	Links	44
6.1	ISO New England Home Page	44
6.2	ISO New England Training Page	44
6.3	ISO New England FAQ Page	44
6.4	SMD Site for ISO Applications	44
6.5	SMD Site for ISO Sandbox Applications	44
6.6	ISO New England Glossary and Acronyms	45
7.	Reference Tables	45
7.1	Table 1: EEM Security Roles	45

1. Web Service Overview

This section gives an overview of web service concepts associated with the EEM web service, how to access the EEM web service, and the appropriate EEM roles.

1.1 Web Service Design

The EEM web service, or programmatic interface, is described by operations that are defined in the EEM WSDL. These operations also describe the messages that are used to transfer energy efficiency measure data between a Lead Market Participant and the EEM application through the interaction of the Market Participant's client interface and EEM's web service. The web service operation messages use REST format for data transmission, which is discussed in more detail in chapter 2 entitled REST Messages.

All web service operations follow a request/reply pattern that is typical of HTTP(S) communication. A request may contain a message that modifies (or submits) data or it may contain a message that queries for data. A reply contains a message that is either: 1) a confirmation of data modification, including warnings when applicable, 2) an error, or 3) the response to a query.

Any web service operation that allows data to be modified will have a corresponding web service operation that allows for that data to be queried. In many cases, this web service operation pairing will have a submit message that contains the exact same data as a query response message. This relationship is referred to as having symmetrical messages. However, not all submit/query response messages are symmetrical. There are cases in which more data is returned in a query response message than can be contained in a submittal message. There are some web service operations that simply have query messages, and they are used for the sole purpose of requesting specific data from the EEM application.

1.2 Accessing the EEM Web Services

The EEM web services are based on REST over HTTPS (version 1.1). A client application that accesses EEM can be written in nearly any modern enterprise technology and language, such as Java, .NET, C++, Ruby, etc. The web service is accessible to authorized Participants through an ISO New England published URL, and all posts/puts of data and queries are serviced via the same URL. ISO New England provides limited support for Java by providing sample implementations.

- Access to EEM web services is managed through the Customer and Asset Management System (CAMS).
- Your company's Security Administrator (SA) is responsible for assigning roles per your company's internal procedures and controls.
- The SA is also responsible for issuing digital certificates to users, as required (e.g., a customer may already have a digital certificate if they already have access to another ISO SMD application).
- For details on managing access, SAs can refer to the "CAMS User Guide for Digital Certificates" which is available by contacting ISO-NE Customer Support.

1.3 EEM Roles

Roles define the web service operations/messages to submit or query data. Roles are divided into two sub-types; "Read Only" (also known as "External EEM Viewer") and "Read/Write" (also known as "External EEM Maintainer"). The Read Only role restricts the user to query messages associated with their role's web service operations, while the Read/Write role allows the use of both submit and query messages. For example, a user with an External EEM Viewer role can only execute HTTP GET operations associated with EEM data, while a user with an External EEM Maintainer role can execute all HTTP GET, PUT and POST operations associated with EEM data. Use of a web service operation by a user without the appropriate role will result in an error (see fault handling in Section 2.1).

2. REST Messages

This section describes constructing REST messages, restrictions on data submitted, and REST format/documentation.

REST is a specification for exchanging information involving Web Services such as EEM. EEM REST messages are constructed using Extensible Markup Language (XML) as a structure to store data. This XML packet carries processing instructions and descriptions of the data for interpretation by an interface or Web Service. For reference, these operations are all described in application.wadl and the types are in eem.xsd.

2.1 REST Operations Responses

Each message sent to EEM is an "all or nothing" event. EEM will use database transactions, such that a commit will only occur on successful processing of an entire REST operation. If an exception occurs while processing a request, a fault will be sent to the user with the appropriate error messages, and the transaction will be rolled back. When a fault is returned, none of the data submitted in the request will be saved.

GET Operations

GET operations return a wide variety of information, and as such they do not have a standard response message unless the message returns a fault as shown in the **Standard Error Submit Response** below.

POST and PUT Operations

POST and PUT operations that are sent to the EEM application have a standard response message that confirms the message was received and processed. The response message contains a transaction ID that is used to track/indicate the confirmation of the message submitted. The standard response message to POST and PUT operations are shown below. They contain an optional Warning element that is used to indicate potential problems with the data that was submitted.

Standard Success Response (for POST and PUT operations)

```
<ApiResponse>
  <Success>true</Success>
  <Message>
    <Code>0</Code>
    <Text>
      Data has been successfully updated.
    </Text>
    <MeasureDetailId>#####</MeasureDetailId>
    <LeadParticipantMeasureId>XXXXXXXX</LeadParticipantMeasureId>
  </Message>
</ApiResponse>
```

Standard Error Response (for all operations)

```
<ApiResponse>
  <Success>false</Success>
  <Message>
    <Code>404</Code>
```

```
<Text>
  Could not find resource for relative : /end_use/COMMERCIAL of full path:
  https://smd.iso-ne.com/CAMS/eem/api/end_use/COMMERCIAL
</Text>
  <MeasureDetailId xsi:nil="true"/>
</Message>
</ApiResponse>
```

2.2 Format and Construction

REST operations are URLs that return a specific XML message based on the request type, thus there are no formatting or constructing issues (other than how to form a URL).

Some sample URLs are shown below:

- https://smd.iso-ne.com/CAMS/eem/api/measure_detail/1
- <https://smd.iso-ne.com/CAMS/eem/api/measure/88888>
- https://smd.iso-ne.com/CAMS/eem/api/end_use
- <https://smd.iso-ne.com/CAMS/eem/api/customer/currentuser>

3. Web Services

This section explains the functionality of the REST operations available for exchanging energy efficiency measure data between a Lead Market Participant and EEM.

3.1 Customer Web Service

3.1.1 Purpose of Message

This Web Service allows a participant to request their customer information.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.1.2 REST Endpoint

<https://smd.iso-ne.com/CAMS/eem/api/customer/currentuser>

3.1.3 Request Method

HTTP GET

3.1.4 Mandatory and Optional Fields

None

3.1.5 Sample Request

To get customer information, invoke the following URL:

<https://smd.iso-ne.com/CAMS/eem/api/customer/currentuser>

3.1.6 Data Returned

```
<Person>
  <PersonId>999999501</PersonId>
  <CustomerId>50051</CustomerId>
  <FirstName>EEM</FirstName>
  <LastName>ISO EEM Maintainer</LastName>
  <Email>testuser@iso-ne.com</Email>
  <CustomerName>ISO New England Inc</CustomerName>
  <CustomerLongName>ISO New England Inc</CustomerLongName>
  <DateUpdated>2014-06-24T20:00:00-04:00</DateUpdated>
  <UpdatedBy>123456789</UpdatedBy>
  <ReadOnly>>false</ReadOnly>
  <Internal>>true</Internal>
</Person>
```

3.2 End Use Web Service

3.2.1 Purpose of Message

This Web Service allows a participant to request the End/Sector use information.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.2.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/end_use

3.2.3 Request Method

HTTP GET

3.2.4 Mandatory and Optional Fields

None

3.2.5 Sample Request

To get end/sector use information, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/end_use

3.2.6 Data Returned

```
<EndUses>
  <EndUse>
    <EndUseType>COMPRESSED_AIR</EndUseType>
    <EndUseDesc>Compressed Air</EndUseDesc>
    <SectorType>COMMERCIAL</SectorType>
    <SectorDesc>Commercial and Industrial Electric Efficiency Measures</SectorDesc>
  </EndUse>
  ...
</EndUses>
```

3.3 Lead Market Participant Web Service

3.3.1 Purpose of Message

This Web Service allows a participant to request their Lead Market Participant information.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.3.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/lead_participant

3.3.3 Request Method

HTTP GET

3.3.4 Mandatory and Optional Fields

None

3.3.5 Sample Request

To get Lead Market Participant information, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/lead_participant

3.3.6 Data Returned

```
<LeadParticipants>
  <LeadParticipant>
    <LeadParticipantId>12345</LeadParticipantId>
    <LeadParticipantName>Joe Wonderful Widgets</LeadParticipantName>
  </LeadParticipant>
  ...
</LeadParticipants>
```

3.4 All or Single Measure Web Service

3.4.1 Purpose of Message

This Web Service allows a participant to request all of their measures or a specific measure.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.4.2 REST Endpoint

<https://smd.iso-ne.com/CAMS/eem/api/measure>

3.4.3 Request Method

HTTP GET

3.4.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
Yes	No	Measure ID	Long	The ISO ID of the measure

If the Measure ID element is not specified, then data for all measures are returned. If the Measure ID element is specified, then data for that specific measure is returned.

3.4.5 Sample Request and Data Returned

To get all measure information, invoke the following URL:

<https://smd.iso-ne.com/CAMS/eem/api/measure>

```
<Measures>
  <Measure>
    <MeasureId>12345</MeasureId>
    <MeasureName>Generic Measure Name</MeasureName>
    <DateEffective>2014-06-01T00:00:00-04:00</DateEffective>
    <AssetId>23456</AssetId>
    <AssetName>Generic Asset Name</AssetName>
    <ResourceId>3456</ResourceId>
    <ResourceName>Generic Resource Name</ResourceName>
    <LoadZoneId>4004</LoadZoneId>
    <LoadZoneName>CT</LoadZoneName>
  </Measure>
  ...
</Measures>
```

To get a specific measure, invoke the following URL:

<https://smd.iso-ne.com/CAMS/eem/api/measure/{Measure ID}>

```
<Measures>
  <Measure>
    <MeasureId>12345</MeasureId>
    <MeasureName>Generic Measure Name</MeasureName>
    <DateEffective>2014-06-01T00:00:00-04:00</DateEffective>
    <AssetId>23456</AssetId>
    <AssetName>Generic Asset Name</AssetName>
    <ResourceId>3456</ResourceId>
    <ResourceName>Generic Resource Name</ResourceName>
    <LoadZoneId>4004</LoadZoneId>
    <LoadZoneName>CT</LoadZoneName>
  </Measure>
</Measures>
```

If a nonexistent measure is requested, an empty XML structure will be returned.

```
<Measures/>
```

3.5 Measure Detail Web Service

3.5.1 Purpose of Message

This Web Service allows a participant to request the most recent version of a measure detail.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.5.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}

3.5.3 Request Method

HTTP GET

3.5.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
No	No	Measure Detail ID	Long	The ISO generated ID of the Measure Detail

3.5.5 Sample Request

To get the most recent version of a specific measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}

3.5.6 Data Returned

```
<MeasureDetails>
  <MeasureDetail>
    <MeasureDetailId>1</MeasureDetailId>
    <DateEffective>2014-11-18T15:43:31-05:00</DateEffective>
    <LeadParticipantId>#####</LeadParticipantId>
    <LeadParticipantName>Generic Lead Participant Name</LeadParticipantName>
    <MeasureId>#####</MeasureId>
    <MeasureName>Generic Measure Name</MeasureName>
    <LpMeasureId>LP Measure Detail Id</LpMeasureId>
    <MeasureDetailName>Measure Detail Name</MeasureDetailName>
    <AssetId>45678</AssetId>
    <AssetName>Generic Asset Name</AssetName>
    <ResourceId>45679</ResourceId>
    <ResourceName>Generic Resource Name</ResourceName>
    <LoadZoneId>4006</LoadZoneId>
    <LoadZoneName>SEMA</LoadZoneName>
    <DistributionCompanyId>#####</DistributionCompanyId>
    <AggregationFlag>true</AggregationFlag>
```

```

<InstallationDate>2014-08-09T00:00:00-04:00</InstallationDate>
<ProgramEffectiveDate>2014-09-01T00:00:00-04:00</ProgramEffectiveDate>
<ProgramExpirationDate>2034-08-01T00:00:00-04:00</ProgramExpirationDate>
<Lifespan>20</Lifespan>
<ReferenceDocumentName>Reference Document Name</ReferenceDocumentName>
<ReferenceCode>Measure References Code</ReferenceCode>
<AggregationCount>1</AggregationCount>
<SummerKw>9.999</SummerKw>
<WinterKw>#####</WinterKw>
<ProgramName>Program Name for Measure</ProgramName>
<SectorType>LOWINCOME</SectorType>
<SectorDesc>Low Income</SectorDesc>
<EndUseType>LOW_CUSTOM</EndUseType>
<EndUseDesc>Custom Measures</EndUseDesc>
<CustomEndUse>Custom End Use</CustomEndUse>
<RetailCustomerName>John Doe</RetailCustomerName>
<Street>1 Main Street</Street>
<City>Holyoke</City>
<State>MA</State>
<PostalCode>01040</PostalCode>
<Comments>This is the most recent version</Comments>
<DateUpdated>2014-11-18T15:43:31-05:00</DateUpdated>
<UpdatedById>999999501</UpdatedById>
<UpdatedByName>EEM ISO EEM Maintainer</UpdatedByName>
<PendingChange>>false</PendingChange>
<Status>CURRENT</Status>
</MeasureDetail>
</MeasureDetails>

```

3.6 Measure Detail History Web Service

3.6.1 Purpose of Message

This Web Service allows a participant to request all versions of a measure detail.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.6.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/history

3.6.3 Request Method

HTTP GET

3.6.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
No	No	Measure Detail ID	Long	The ISO generated ID of the Measure Detail

3.6.5 Sample Request

To get all versions of a specific measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/history

3.6.6 Data Returned

```

<MeasureDetails>
  <MeasureDetail>
    <MeasureDetailId>1</MeasureDetailId>
    <DateEffective>2014-11-18T15:43:31-05:00</DateEffective>
    <LeadParticipantId>#####</LeadParticipantId>
    <LeadParticipantName>Generic Lead Participant Name</LeadParticipantName>
    <MeasureId>#####</MeasureId>
    <MeasureName>Generic Measure Name</MeasureName>
    <LpMeasureId>LP Measure Detail Id</LpMeasureId>
    <MeasureDetailName>Measure Detail Name</MeasureDetailName>
    <AssetId>45678</AssetId>
    <AssetName>Generic Asset Name</AssetName>
    <ResourceId>45679</ResourceId>
    <ResourceName>Generic Resource Name</ResourceName>
    <LoadZoneId>4006</LoadZoneId>
    <LoadZoneName>SEMA</LoadZoneName>
    <DistributionCompanyId>#####</DistributionCompanyId>
    <AggregationFlag>true</AggregationFlag>
    <InstallationDate>2014-08-09T00:00:00-04:00</InstallationDate>
    <ProgramEffectiveDate>2014-09-01T00:00:00-04:00</ProgramEffectiveDate>
    <ProgramExpirationDate>2034-08-01T00:00:00-04:00</ProgramExpirationDate>
    <Lifespan>20</Lifespan>
    <ReferenceDocumentName>Reference Document Name</ReferenceDocumentName>
    <ReferenceCode>Measure References Code</ReferenceCode>
    <AggregationCount>1</AggregationCount>
    <SummerKw>9.999</SummerKw>
    <WinterKw>#####</WinterKw>
    <ProgramName>Program Name for Measure</ProgramName>
    <SectorType>LOWINCOME</SectorType>
    <SectorDesc>Low Income</SectorDesc>
    <EndUseType>LOW_CUSTOM</EndUseType>
    <EndUseDesc>Custom Measures</EndUseDesc>
    <CustomEndUse>Custom End Use</CustomEndUse>
    <RetailCustomerName>John Doe</RetailCustomerName>
    <Street>1 Main Street</Street>
    <City>Holyoke</City>
    <State>MA</State>
  
```

```

<PostalCode>01040</PostalCode>
<Comments>This is a test</Comments>
<DateUpdated>2014-11-18T15:43:31-05:00</DateUpdated>
<UpdatedById>999999501</UpdatedById>
<UpdatedByName>EEM ISO EEM Maintainer</UpdatedByName>
<PendingChange>>false</PendingChange>
<Status>CURRENT</Status>
</MeasureDetail>
...
<MeasureDetail>
  <MeasureDetailId>1</MeasureDetailId>
  <DateEffective>2014-10-10T10:30:32-05:00</DateEffective>
  <LeadParticipantId>#####</LeadParticipantId>
  <LeadParticipantName>Generic Lead Participant Name</LeadParticipantName>
  <MeasureId>#####</MeasureId>
  <MeasureName>Generic Measure Name</MeasureName>
  <LpMeasureId>LP Measure Detail Id</LpMeasureId>
  <MeasureDetailName>Measure Detail Name</MeasureDetailName>
  <AssetId>45678</AssetId>
  <AssetName>Generic Asset Name</AssetName>
  <ResourceId>45679</ResourceId>
  <ResourceName>Generic Resource Name</ResourceName>
  <LoadZoneId>4006</LoadZoneId>
  <LoadZoneName>SEMA</LoadZoneName>
  <DistributionCompanyId>#####</DistributionCompanyId>
  <AggregationFlag>>true</AggregationFlag>
  <InstallationDate>2014-08-09T00:00:00-04:00</InstallationDate>
  <ProgramEffectiveDate>2014-09-01T00:00:00-04:00</ProgramEffectiveDate>
  <ProgramExpirationDate>2034-08-01T00:00:00-04:00</ProgramExpirationDate>
  <Lifespan>20</Lifespan>
  <ReferenceDocumentName>Reference Document Name</ReferenceDocumentName>
  <ReferenceCode>Measure References Code</ReferenceCode>
  <AggregationCount>1</AggregationCount>
  <SummerKw>9.999</SummerKw>
  <WinterKw>#####</WinterKw>
  <ProgramName>Program Name for Measure</ProgramName>
  <SectorType>LOWINCOME</SectorType>
  <SectorDesc>Low Income</SectorDesc>
  <EndUseType>LOW_CUSTOM</EndUseType>
  <EndUseDesc>Custom Measures</EndUseDesc>
  <CustomEndUse>Custom End Use</CustomEndUse>
  <RetailCustomerName>John Doe</RetailCustomerName>
  <Street>1 Main Street</Street>
  <City>Holyoke</City>
  <State>MA</State>
  <PostalCode>01040</PostalCode>
  <Comments>This is another test</Comments>
  <DateUpdated>2014-11-18T15:43:31-05:00</DateUpdated>
  <UpdatedById>999999501</UpdatedById>

```

```

<UpdatedByName>EEM ISO EEM Maintainer</UpdatedByName>
<PendingChange>>false</PendingChange>
<Status>CURRENT</Status>
</MeasureDetail>
</MeasureDetails>

```

3.7 Pending Measure Details Web Service

3.7.1 Purpose of Message

This Web Service allows a participant to request all pending versions of a measure detail.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.7.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pending

3.7.3 Request Method

HTTP GET

3.7.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
No	No	Measure Detail ID	Long	The ISO generated ID of the Measure Detail

3.7.5 Sample Request

To get all pending versions of a specific measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pending

3.7.6 Data Returned

```

<MeasureDetails>
  <MeasureDetail>
    <MeasureDetailId>1</MeasureDetailId>
    <DateEffective>2014-11-18T15:43:31-05:00</DateEffective>
    <LeadParticipantId>#####</LeadParticipantId>
    <LeadParticipantName>Generic Lead Participant Name</LeadParticipantName>
    <MeasureId>#####</MeasureId>
    <MeasureName>Generic Measure Name</MeasureName>
    <LpMeasureId>LP Measure Detail Id</LpMeasureId>
    <MeasureDetailName>Measure Detail Name</MeasureDetailName>
    <AssetId>45678</AssetId>
    <AssetName>Generic Asset Name</AssetName>
  </MeasureDetail>
</MeasureDetails>

```

```

<ResourceId>45679</ResourceId>
<ResourceName>Generic Resource Name</ResourceName>
<LoadZoneId>4006</LoadZoneId>
<LoadZoneName>SEMA</LoadZoneName>
<DistributionCompanyId>#####</DistributionCompanyId>
<AggregationFlag>true</AggregationFlag>
<InstallationDate>2014-08-09T00:00:00-04:00</InstallationDate>
<ProgramEffectiveDate>2014-09-01T00:00:00-04:00</ProgramEffectiveDate>
<ProgramExpirationDate>2034-08-01T00:00:00-04:00</ProgramExpirationDate>
<Lifespan>20</Lifespan>
<ReferenceDocumentName>Reference Document Name</ReferenceDocumentName>
<ReferenceCode>Measure References Code</ReferenceCode>
<AggregationCount>1</AggregationCount>
<SummerKw>9.999</SummerKw>
<WinterKw>#####</WinterKw>
<ProgramName>Program Name for Measure</ProgramName>
<SectorType>LOWINCOME</SectorType>
<SectorDesc>Low Income</SectorDesc>
<EndUseType>LOW_CUSTOM</EndUseType>
<EndUseDesc>Custom Measures</EndUseDesc>
<CustomEndUse>Custom End Use</CustomEndUse>
<RetailCustomerName>John Doe</RetailCustomerName>
<Street>1 Main Street</Street>
<City>Holyoke</City>
<State>MA</State>
<PostalCode>01040</PostalCode>
<Comments>This is the most recent version</Comments>
<DateUpdated>2014-11-18T15:43:31-05:00</DateUpdated>
<UpdatedById>999999501</UpdatedById>
<UpdatedByName>EEM ISO EEM Maintainer</UpdatedByName>
<PendingChange>true</PendingChange>
<Status>PENDING</Status>
</MeasureDetail>
</MeasureDetails>

```

3.8 Current and Pending Measure Detail Web Service

3.8.1 Purpose of Message

This Web Service allows a participant to request all current and pending versions of a measure detail.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.8.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pendingmeasuredetails

3.8.3 Request Method

HTTP GET

3.8.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
No	No	Measure Detail ID	Long	The ISO generated ID of the Measure Detail

3.8.5 Sample Request

To get all current and pending versions of a specific measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pendingmeasuredetails

3.8.6 Data Returned

```
<MeasureDetails>
  <MeasureDetail>
    <MeasureDetailId>24</MeasureDetailId>
    <DateEffective>2014-12-15T11:03:43-05:00</DateEffective>
    <LeadParticipantId>#####</LeadParticipantId>
    <LeadParticipantName>Generic Lead Participant Name 2</LeadParticipantName>
    <MeasureId>88888</MeasureId>
    <MeasureName>88888 Measure Name</MeasureName>
    <LpMeasureId>Generic Lead Participant ##### - Measure Detail Id</LpMeasureId>
    <MeasureDetailName>Generic Lead Participant ##### - Measure Detail Name</MeasureDetailName>
    <AssetId>88887</AssetId>
    <AssetName>88888 Measure Name</AssetName>
    <ResourceId>88889</ResourceId>
    <ResourceName>88890 Resource Name</ResourceName>
    <LoadZoneId>4004</LoadZoneId>
    <LoadZoneName>CT</LoadZoneName>
    <DistributionCompanyId>#####</DistributionCompanyId>
    <AggregationFlag>true</AggregationFlag>
    <InstallationDate>2010-01-23T00:00:00-05:00</InstallationDate>
    <ProgramEffectiveDate>2014-07-01T00:00:00-04:00</ProgramEffectiveDate>
    <ProgramExpirationDate>2030-01-01T00:00:00-05:00</ProgramExpirationDate>
    <Lifespan>20</Lifespan>
    <ReferenceDocumentName>Generic Lead Participant ##### - Ref Doc Name</ReferenceDocumentName>
    <ReferenceCode>Generic Lead Participant ##### Measure Ref Code</ReferenceCode>
    <AggregationCount>8</AggregationCount>
    <SummerKw>9.99</SummerKw>
    <WinterKw>9</WinterKw>
```

```

<ProgramName>Generic Lead Participant ##### - Program Name</ProgramName>
<SectorType>RESIDENTIAL</SectorType>
<SectorDesc>Residential Electric Efficiency Measures</SectorDesc>
<EndUseType>RES_BEHAVIOR</EndUseType>
<EndUseDesc>Behavior</EndUseDesc>
<CustomEndUse>Custom End Use</CustomEndUse>
<RetailCustomerName>Test Retail Customer Name</RetailCustomerName>
<Street>1 Main Street</Street>
<City>Chicopee</City>
<State>MA</State>
<PostalCode>01020</PostalCode>
<Comments>Attempting to update Lifespan to 20 for 181: Read Only - false</Comments>
<DateUpdated>2014-12-15T11:03:43-05:00</DateUpdated>
<UpdatedById>999999999</UpdatedById>
<UpdatedByName>EEM External EEM Maintainer</UpdatedByName>
<PendingChange>true</PendingChange>
<Status>PENDING</Status>
<ProcessedByName> </ProcessedByName>
</MeasureDetail>
<MeasureDetail>
  <MeasureDetailId>24</MeasureDetailId>
  <DateEffective>2014-12-15T11:03:43-05:00</DateEffective>
  <LeadParticipantId>#####</LeadParticipantId>
  <LeadParticipantName>Generic Lead Participant Name 2</LeadParticipantName>
  <MeasureId>88888</MeasureId>
  <MeasureName>88888 Measure Name</MeasureName>
  <LpMeasureId>Generic Lead Participant ##### - Measure Detail Id</LpMeasureId>
  <MeasureDetailName>Generic Lead Participant ##### - Measure Detail Name</MeasureDetailName>
  <AssetId>88887</AssetId>
  <AssetName>88888 Measure Name</AssetName>
  <ResourceId>88889</ResourceId>
  <ResourceName>88890 Resource Name</ResourceName>
  <LoadZoneId>4004</LoadZoneId>
  <LoadZoneName>CT</LoadZoneName>
  <DistributionCompanyId>#####</DistributionCompanyId>
  <AggregationFlag>true</AggregationFlag>
  <InstallationDate>2010-01-23T00:00:00-05:00</InstallationDate>
  <ProgramEffectiveDate>2014-07-01T00:00:00-04:00</ProgramEffectiveDate>
  <ProgramExpirationDate>2030-01-01T00:00:00-05:00</ProgramExpirationDate>
  <Lifespan>20</Lifespan>
  <ReferenceDocumentName>Generic Lead Participant ##### - Ref Doc Name</ReferenceDocumentName>
  <ReferenceCode>Generic Lead Participant ##### Measure Ref Code</ReferenceCode>
  <AggregationCount>8</AggregationCount>
  <SummerKw>9.99</SummerKw>
  <WinterKw>9</WinterKw>
  <ProgramName>Generic Lead Participant ##### - Program Name</ProgramName>
  <SectorType>RESIDENTIAL</SectorType>
  <SectorDesc>Residential Electric Efficiency Measures</SectorDesc>
  <EndUseType>RES_BEHAVIOR</EndUseType>

```

```

<EndUseDesc>Behavior</EndUseDesc>
<CustomEndUse>Custom End Use</CustomEndUse>
<RetailCustomerName> Test Retail Customer Name</RetailCustomerName>
<Street>1 Main Street</Street>
<City>Chicopee</City>
<State>MA</State>
<PostalCode>01020</PostalCode>
<Comments>Attempting to update Lifespan to 20 for 181: Read Only - false</Comments>
<DateUpdated>2014-12-15T11:03:43-05:00</DateUpdated>
<UpdatedById>999999999</UpdatedById>
<UpdatedByName>EEM External EEM Maintainer</UpdatedByName>
<PendingChange>>true</PendingChange>
<Status>CURRENT</Status>
<ProcessedByName> </ProcessedByName>
</MeasureDetail>
</MeasureDetails>

```

3.9 Create New Measure Detail Web Service

3.9.1 Purpose of Message

This Web Service allows a participant to create new measure details.

This section applies to the following EEM role:

- External EEM Maintainer

3.9.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/create

3.9.3 Request Method

HTTP POST

3.9.4 Mandatory and Optional Fields

Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
Yes	Yes	Lead Participant ID	Long	This is retrieved from the user Certificate
Yes	Yes	Lead Participant Name	String	This is retrieved from the database based on the Lead Participant ID
Yes	Yes	Measure Detail ID	Long	The ISO generated ID of the Measure Detail
Yes	Yes	LP Measure Detail ID	String	Lead Participant's Unique Identifier for the Measure Detail
No	No	Measure Detail Name	String	Name for the Measure Detail
No	No	Distribution Company ID	Long	The Distribution Company ID No Validation is performed

				on this value.
No	No	Installation Date	XML Calendar; YYYY-MM-DDTHH:MI:SS-04:00	The Installation day in EST/EDT time. Time is Midnight.
Yes	Yes	Measure Effective Date	XML Calendar; YYYY-MM-DDTHH:MI:SS-04:00	Effective Date – Usually the 1 st of the month following the measure detail installation.
No	No	Measure Life	Long	Years for the Measure Life (1 through a max of 30).
Yes	Yes	Measure Expiration Date	XML Calendar; YYYY-MM-DDTHH:MI:SS-04:00	The Date the Measure Detail Expires (Set by ISO – Not user Modifiable).
No	No	Program Name	String	Name of the Program
No	No	Sector/End Use	String	Sector and End Use
Yes	Yes	Custom End Use	String	User String for additional information about the end use.
No	No	Aggregation Flag	Boolean	True if aggregation, False if it is a single unit
No	No	Aggregation Count	Long	Number of Units aggregated together
No	No	Monthly Summer kW	Long	Summer kW - Value of +/- Kilowatts for the Summer
No	No	Monthly Winter kW	Long	Winter kW
No	No	Measure ID	Long	The ISO ID of the measure
Yes	Yes	Measure Name	String	The ISO Name of the measure
Yes	Yes	Asset ID	Long	The Asset ID of the measure
Yes	Yes	Asset Name	String	The Asset Name of the measure
Yes	Yes	Resource ID	Long	The Resource ID of the measure
Yes	Yes	Resource Name	String	The Resource Name of the measure
Yes	Yes	Load Zone ID	Long	The Load Zone ID of the measure
Yes	Yes	Load Zone Name	String	The Load Zone Name of the measure
Yes	Yes	Retail Customer Name	String	Retail Customer Name is not required
Yes	Yes	Street	String	Street is not required
Yes	Yes	City	String	City is not required
Yes	Yes	State	String	State is not required; if provided it must be a New England State
Yes	Yes	Zip Code	String (Length of 5 and valid values are 0-9 – No alphabetic characters)	Zip Code is not required. No Extended Zip Code data allowed.
No	No	Reference Document Name	String	Reference Document Name

No	No	Measure Reference Code	String	Measure Reference Code
Yes	Yes	Date Updated	XML Calendar; YYYY-MM-DDTHH:MI:SS-04:00	Date of the measure detail creation (Set by ISO – Not user modifiable).
Yes	Yes	Updated By	String	User performing the measure detail creation (Set by ISO – Not User modifiable – from the user certificate).
Yes	Yes	Comments	String	Comment is not required

3.9.5 Additional Value Restrictions

Field	Definition	Rules
Lead Participant ID	Customer Name and ID for user.	Not Editable. System Generated.
ISO Measure Detail ID	Each ISO Measure Detail ID is unique throughout the EEM Database system.	Not Editable. System Generated after successful creation of Measure Detail.
LP Measure Detail ID	Used to limit duplicate Measure Detail records and provide Participant with a key field to match with their database.	Required. Alphanumeric values accepted. Limited to 100 characters. Must be unique to Lead Participant.
Record Begin Date	Date that the version of the data set for a measure detail became effective.	System generated using the system date and time at the point that the version of the data was written to the database.
Record End Date	Date that the version of the data set for a measure detail expired.	System generated.
Measure Detail Name	Name of measure detail installed.	Optional. Alphanumeric values accepted. Limited to 100 characters.
Distribution Company ID	ID of distribution company where Measure Detail is located.	Only numeric values accepted. Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW.
Installation Date	Date that measure detail was installed.	Required. Must be a valid date in MM/DD/YYYY format, after June 1, 2006 and prior to the current system date. If more than three years prior to the current system date, the Measure Detail will be put into Pending and will require ISO Approval before being applied.
First Month in Market	First month that savings can be reported for the measure detail.	Derived by the system based on Measure Installation Date and the initial performance month resettlement date. Will always be the first day of a month.

Measure Life	Measure Detail life in years.	Required. Must be numeric, with at most one decimal place. Cannot be greater than ISO defined maximum (currently 30 years).
Measure Expiration Date	The month, day and year that the measure detail will have reached its end of useful life.	Not editable. System calculated using Installation Date and Measure Life.
Program Name	Name of the program in which the measure detail belongs.	Required. Alphanumeric values accepted. Limited to 100 characters.
Sector	Sector applicable to measure detail.	Required. Alphanumeric values accepted.
End Use	Describes the type of measure.	Required. Alphanumeric values accepted. Custom measure option for each sector.
Custom End Use	Used when custom End Use is chosen or for elaboration of non-custom measure details.	Required if a "Custom Measure" option is chosen for End Use. Limited to 100 characters.
Aggregation	Flag that indicates if multiple end uses are aggregated into a single Measure Level Detail.	Required. Limited to "Y" and "N".
Number of Aggregation (Aggregation Count)	Number of end uses aggregated into a single Measure Level Detail.	Required. Only editable if Aggregation value is "Y". Must be greater than zero. Defaults to 1 if Aggregation = "N". Rounds to the nearest whole number using standard rounding rules. Limited to seven digits.
Monthly kW Summer	Calculated kW savings from measure detail for a summer month.	Required. Only numeric values accepted. If Aggregation value is "Y", the kW value divided by Number of Aggregation must be less than 10kW. Rounded to three decimal places using standard rounding rules.
Monthly kW Winter	Calculated kW savings from measure detail for a winter month.	Required. Only numeric values accepted. If Aggregation value is "Y", the kW value divided by Number of Aggregation must be less than 10kW. Rounded to three decimal places using standard rounding rules.
CAMS Measure ID	CAMS Measure ID used to represent full set of measure data.	Required. Alphanumeric values accepted. Must be an On-Peak or Seasonal Peak CAMS measure that belongs to Lead Participant entering measure detail.
Asset	The CAMS Asset that the measure detail is associated with.	Not editable. System generated based on value chosen for CAMS Measure ID.

Resource	The CAMS Resource that the asset is associated with.	Not editable. System generated based on value chosen for CAMS Measure ID.
Load Zone	The Load Zone where the Resource is located.	Not editable. System generated based on value chosen for CAMS Measure ID.
Retail Customer Name	Name of retail customer for Measure Detail.	Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW. Alphanumeric values accepted. Limited to 100 characters.
Street	Street Address where the measure detail is located.	Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW. Alphanumeric values accepted. Limited to 50 characters.
City	City where the measure detail is located.	Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW. Alphanumeric values accepted. Limited to 50 characters.
State	State where the measure detail is located.	Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW. Limited to the six New England states.
Zip Code	Zip code where the measure detail is located.	Required if Aggregation is 'N' and either Monthly kW Summer or Monthly kW Winter \geq 10kW. Must contain exactly five digits.
Reference Document Name	Name and version of the document from which Measure Detail savings and measure life information is taken.	Required. Alphanumeric values accepted. Limited to 100 characters.
Measure Reference Code	Code for Measure Detail as it appears in reference document cited.	Required. Alphanumeric values accepted. Limited to 100 characters.
Updated Date	Indicates the date that this version of the Measure Detail's data was created.	Not Editable. Generated using the system date and time of the creation of this version of the Measure Detail.
Updated By	Indicates the user that created this version of the Measure Detail's data.	Not editable. Generated using the user name associated with the certificate of the user responsible for creation of this version of the Measure Detail's data.
Comments	Free form field for Lead Participant comment entry. The main purpose of this field is expected to be for descriptions of why an update is being done.	Required if the Measure Detail is "Closed Winter", "Closed Summer" or "Closed Final". Limited to 4000 characters.

3.9.6 Sample Request

To create a measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/create

```
<MeasureDetail>
  <MeasureDetailId>12345</MeasureDetailId>
  <DateEffective>2014-12-15T11:03:43-05:00</DateEffective>
  <LeadParticipantId>#####</LeadParticipantId>
  <LeadParticipantName>Generic Lead Participant 2</LeadParticipantName>
  <MeasureId>88888</MeasureId>
  <MeasureName>88888 Measure Name</MeasureName>
  <LpMeasureId>Generic Lead Participant ##### - Measure Detail Id</LpMeasureId>
  <MeasureDetailName>Generic Lead Participant ##### - Measure Detail Name</MeasureDetailName>
  <AssetId>88887</AssetId>
  <AssetName>88888 Measure Name</AssetName>
  <ResourceId>88889</ResourceId>
  <ResourceName>88890 Resource Name</ResourceName>
  <LoadZoneId>4004</LoadZoneId>
  <LoadZoneName>CT</LoadZoneName>
  <DistributionCompanyId>#####</DistributionCompanyId>
  <AggregationFlag>true</AggregationFlag>
  <InstallationDate>2010-01-23T00:00:00-05:00</InstallationDate>
  <ProgramEffectiveDate>2014-07-01T00:00:00-04:00</ProgramEffectiveDate>
  <ProgramExpirationDate>2030-01-01T00:00:00-05:00</ProgramExpirationDate>
  <Lifespan>25</Lifespan>
  <ReferenceDocumentName>Generic Lead Participant ##### - Ref Doc Name</ReferenceDocumentName>
  <ReferenceCode>Generic Lead Participant ##### Measure Ref Code</ReferenceCode>
  <AggregationCount>8</AggregationCount>
  <SummerKw>9.99</SummerKw>
  <WinterKw>9</WinterKw>
  <ProgramName>Generic Lead Participant ##### - Program Name</ProgramName>
  <SectorType>RESIDENTIAL</SectorType>
  <SectorDesc>Residential Electric Efficiency Measures</SectorDesc>
  <EndUseType>RES_BEHAVIOR</EndUseType>
  <EndUseDesc>Behavior</EndUseDesc>
  <CustomEndUse>Custom End Use</CustomEndUse>
  <RetailCustomerName>Test Retail Customer Name</RetailCustomerName>
  <Street>1 Main Street</Street>
  <City>Chicopee</City>
  <State>MA</State>
  <PostalCode>01020</PostalCode>
</MeasureDetail>
```

3.9.7 Data Returned

```
<ApiResponse>
  <Success>true</Success>
  <Message>
```

```

<Code>0</Code>
<Text>
Data has been successfully added
</Text>
<MeasureDetailId >12345</MeasureDetailId >
<LeadParticipantId> Generic Lead Participant ##### - Measure Detail Id </LeadParticipantId>
</Message>
</ApiResponse>

```

If errors are encountered, a fault will be returned as described in Section 2.1

3.10 Cancel Pending Measure Web Service

3.10.1 Purpose of Message

This Web Service allows a participant to cancel a specific measure detail that is in a pending state.

This section applies to the following EEM role:

- External EEM Maintainer

3.10.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pending/cancel

3.10.3 Request Method

HTTP POST

3.10.4 Mandatory and Optional Fields

Basic Information				
Opt.	Nil.	Element or Attribute	Data Type; Format	Comments
No	Yes	Measure Detail ID	Long	The ISO generated ID of the Measure Detail

3.10.5 Sample Request

To cancel a measure detail that is in a pending state, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}/pending/cancel

3.10.6 Data Returned

```

<ApiResponse>
<Success>>true</Success>
<Message>
<Code>0</Code>
<Text>
Successfully cancelled pending measure detail
</Text>
<MeasureDetailId >{Measure Detail ID}</MeasureDetailId >
</Message>

```

</ApiResponse>

If errors are encountered, a fault will be returned as described in Section 2.1

3.11 Update Measure Detail Web Service

3.11.1 Purpose of Message

This Web Service allows a participant to update an existing measure detail.

This section applies to the following EEM role:

- External EEM Maintainer

3.11.2 REST Endpoint

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}

3.11.3 Request Method

HTTP PUT

3.11.4 Mandatory and Optional Fields

See Section 3.9.4.

3.11.5 Additional Value Restrictions

See Section 3.9.5 for a list of additional value restrictions, with the following exception:

Field	Definition	Rules
Measure Life	Measure Detail life in years.	Required. Must be numeric, with at most one decimal place. Cannot be greater than ISO defined maximum (currently 30 years). When updated, the updated Measure Detail will be put into Pending and will require ISO Approval before being applied.
Monthly kW Summer	Calculated kW savings from measure detail for a summer month.	Required. Only numeric values accepted. If Aggregation value is "Y", the kW value divided by Number of Aggregation must be less than 10kW. Rounded to three decimal places using standard rounding rules. When updated, the updated Measure Detail will be put into Pending and will require ISO Approval before being applied.
Monthly kW Winter	Calculated kW savings from measure detail for a winter month.	Required. Only numeric values accepted. If Aggregation value is "Y", the kW value divided by Number of Aggregation must be less than 10kW. Rounded to three decimal places using standard rounding rules. When updated, the updated Measure Detail will be put into Pending and will require ISO Approval before being applied.
CAMS Measure ID	CAMS Measure ID used to represent full set of measure	Required. Alphanumeric values accepted. Must be an On-Peak or Seasonal Peak CAMS measure

	data.	that belongs to Lead Participant entering measure detail. When updated, the updated Measure Detail will be put into Pending and will require ISO Approval before being applied.
Comments	Free form field for Lead Participant comment entry. The main purpose of this field is expected to be for descriptions of why an update is being done.	Required if the Measure Detail is "Closed Winter", "Closed Summer" or "Closed Final" and a change was made to Installation Date, Measure Life (yrs), Monthly kW Summer, Monthly kW Winter, or Measure. Limited to 4000 characters.

3.11.6 Sample Request

To update an existing measure detail, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/{Measure Detail ID}

```

<MeasureDetail>
  <MeasureDetailId>12345</MeasureDetailId>
  <DateEffective>2014-12-15T11:03:43-05:00</DateEffective>
  <LeadParticipantId>#####</LeadParticipantId>
  <LeadParticipantName>Generic Lead Participant Name 2</LeadParticipantName>
  <MeasureId>88888</MeasureId>
  <MeasureName>88888 Measure Name</MeasureName>
  <LpMeasureId>Generic Lead Participant ##### - Measure Detail Id</LpMeasureId>
  <MeasureDetailName>Generic Lead Participant ##### - Measure Detail Name</MeasureDetailName>
  <AssetId>88887</AssetId>
  <AssetName>88888 Measure Name</AssetName>
  <ResourceId>88889</ResourceId>
  <ResourceName>88890 Resource Name</ResourceName>
  <LoadZoneId>4004</LoadZoneId>
  <LoadZoneName>CT</LoadZoneName>
  <DistributionCompanyId>#####</DistributionCompanyId>
  <AggregationFlag>true</AggregationFlag>
  <InstallationDate>2010-01-23T00:00:00-05:00</InstallationDate>
  <ProgramEffectiveDate>2014-07-01T00:00:00-04:00</ProgramEffectiveDate>
  <ProgramExpirationDate>2030-01-01T00:00:00-05:00</ProgramExpirationDate>
  <Lifespan>25</Lifespan>
  <ReferenceDocumentName>Generic Lead Participant ##### - Ref Doc Name</ReferenceDocumentName>
  <ReferenceCode>Generic Lead Participant ##### Measure Ref Code</ReferenceCode>
  <AggregationCount>10</AggregationCount>
  <SummerKw>9.99</SummerKw>
  <WinterKw>9</WinterKw>
  <ProgramName>Generic Lead Participant ##### - Program Name</ProgramName>
  <SectorType>RESIDENTIAL</SectorType>
  <SectorDesc>Residential Electric Efficiency Measures</SectorDesc>
  <EndUseType>RES_BEHAVIOR</EndUseType>
  <EndUseDesc>Behavior</EndUseDesc>
  <CustomEndUse>Custom End Use</CustomEndUse>
  <RetailCustomerName>Test Retail Customer Name</RetailCustomerName>

```

```

<Street>1 Main Street</Street>
<City>Chicopee</City>
<State>MA</State>
<PostalCode>01020</PostalCode>
</MeasureDetail>

```

3.11.7 Data Returned

```

<ApiResponse>
  <Success>true</Success>
  <Message>
    <Code>0</Code>
    <Text>
      Data has been successfully updated
    </Text>
    <MeasureDetailId >12345</MeasureDetailId >
    <LeadParticipantId>Generic Lead Participant ##### - Measure Detail Id</LeadParticipantId>
  </Message>
</ApiResponse>

```

If errors are encountered, a fault will be returned as described in Section 2.1.

3.12 Search Specific Measure Detail Web Service

3.12.1 Purpose of Message

This Web Service allows a participant to search for a specific measure or all measures.

This section applies to the following EEM roles:

- External EEM Maintainer
- External EEM Viewer

3.12.2 REST Endpoints

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/search

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/pending/search?param#=val1¶m#=val2&...

3.12.3 Request Method

HTTP GET

3.12.4 Mandatory and Optional Fields

Where param# is one or more of these parameters:

Opt.	Nil.	Param#	Data Type; Format	Comments
No	No	asOf	Date in the format of YYYY-MM-DDT00:00:00	Date to get the measure as of (You will normally default it to today).
Yes	Yes	measureDetailID	Long	The ISO generated ID of the

				Measure Detail (Will always return a single entry).
Yes	Yes	leadParticipantID	Long	Lead Participant ID (i.e. YOUR Lead Participant ID is the only Valid option for this).
Yes	Yes	lpMeasureID	String	LP Measure ID – The up to 100 character unique ID for the measure.
Yes	Yes	retailCustomerName	String	Retail Customer name where this measure detail is installed.
Yes	Yes	assetID	Long	Asset ID of the Measure
Yes	Yes	resourceID	Long	Resource ID of the Measure
Yes	Yes	loadZoneID	Long	Load Zone ID of the Measure
Yes	Yes	programName	String	Program Name
Yes	Yes	referenceCode	String	Reference Code
Yes	Yes	city	String	City
Yes	Yes	state	String	State
Yes	Yes	marketMonth	Date in the format of YYYY-MM-DDT00:00:00	Market Month
Yes	Yes	minInstallationDate	Date in the format of YYYY-MM-DDT00:00:00	Minimum Installation Date
Yes	Yes	maxInstallationDate	Date in the format of YYYY-MM-DDT00:00:00	Max Installation Date
Yes	Yes	minExpirationDate	Date in the format of YYYY-MM-DDT00:00:00	Min Expiration Date
Yes	Yes	maxExpirationDate	Date in the format of YYYY-MM-DDT00:00:00	Max Expiration Date
Yes	Yes	sortBy	String	Sort By Column
Yes	Yes	sortDirection	String	Sort Direction (ASC or DESC; default sort order is ASC)
Yes	Yes	start	Integer	Which result to return first (default is to start with first)
Yes	Yes	limit	Integer	How many results to return per request (default is all)
Yes	Yes	endUseType	String	End Use Type

3.12.5 Sample Request

To get search results returned as an XML packet, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/search?parm#=val1&parm#=val2...

To get search results returned as a CSV file, invoke the following URL:

https://smd.iso-ne.com/CAMS/eem/api/measure_detail/search/csv?parm#=val1&parm#=val2...

3.12.6 Data Returned

XML Results

```
<MeasureDetail>
  <MeasureDetailId>12345</MeasureDetailId>
  <DateEffective>2014-12-15T11:03:43-05:00</DateEffective>
  <LeadParticipantId>#####</LeadParticipantId>
  <LeadParticipantName>Generic Lead Participant Name 2</LeadParticipantName>
  <MeasureId>88888</MeasureId>
  <MeasureName>88888 Measure Name</MeasureName>
  <LpMeasureId>Generic Lead Participant ##### - Measure Detail Id</LpMeasureId>
  <MeasureDetailName>Generic Lead Participant ##### - Measure Detail Name</MeasureDetailName>
  <AssetId>88887</AssetId>
  <AssetName>88888 Measure Name</AssetName>
  <ResourceId>88889</ResourceId>
  <ResourceName>88890 Resource Name</ResourceName>
  <LoadZoneId>4004</LoadZoneId>
  <LoadZoneName>CT</LoadZoneName>
  <DistributionCompanyId>#####</DistributionCompanyId>
  <AggregationFlag>true</AggregationFlag>
  <InstallationDate>2010-01-23T00:00:00-05:00</InstallationDate>
  <ProgramEffectiveDate>2014-07-01T00:00:00-04:00</ProgramEffectiveDate>
  <ProgramExpirationDate>2030-01-01T00:00:00-05:00</ProgramExpirationDate>
  <Lifespan>25</Lifespan>
  <ReferenceDocumentName>Generic Lead Participant ##### - Ref Doc Name</ReferenceDocumentName>
  <ReferenceCode>Generic Lead Participant ##### Measure Ref Code</ReferenceCode>
  <AggregationCount>8</AggregationCount>
  <SummerKw>9.99</SummerKw>
  <WinterKw>9</WinterKw>
  <ProgramName>Generic Lead Participant ##### - Program Name</ProgramName>
  <SectorType>RESIDENTIAL</SectorType>
  <SectorDesc>Residential Electric Efficiency Measures</SectorDesc>
  <EndUseType>RES_BEHAVIOR</EndUseType>
  <EndUseDesc>Behavior</EndUseDesc>
  <CustomEndUse>Custom End Use</CustomEndUse>
  <RetailCustomerName>Test Retail Customer Name</RetailCustomerName>
  <Street>1 Main Street</Street>
  <City>Chicopee</City>
  <State>MA</State>
  <PostalCode>01020</PostalCode>
  <Comments>Generic Comments
```

```
May be on multiple lines</Comments>
<DateUpdated>2014-11-18T15:43:31-05:00</DateUpdated>
<UpdatedById>999999501</UpdatedById>
<UpdatedByName>EEM ISO EEM Maintainer</UpdatedByName>
<PendingChange>>false</PendingChange>
<Status>CURRENT</Status>
</MeasureDetail>
```

CSV Results

```
"Lead Participant ID","Measure Detail ID","Record Begin Date","Record End Date","Lead Participant
Measure Detail ID","Measure Detail Name","Measure ID","Distribution Company ID","Aggregation
Flag","Aggregation Count","Installation Date","First Month in Market","Measure Life","Measure Expiration
Date","Program Name","Sector","End Use","Custom End Use","Asset ID","Resource ID","Load Zone
ID","Retail Customer Name","Street","City","State","Zip","Reference Document Name","Measure Reference
Code","Monthly kW Summer","Monthly kW Winter","Updated By","Updated Date","Comments"
#####,12345,"2014-12-15T11:03:43-05:00","", "Generic Lead Participant ##### - Measure Detail Id", "Generic
Lead Participant ##### - Measure Detail Name",88888,#####,"true",8,
"01/23/2010","07/01/2014",25,"01/01/2030", "Generic Lead Participant ##### - Program
Name", "RESIDENTIAL", "RES_BEHAVIOR", "Custom End Use",88887,88890,4004, "Test Retail Customer
Name", "1 Main Street", "Chicopee", "MA", "01020", "Generic Lead Participant ##### - Ref Doc
Name", "Generic Lead Participant ##### Measure Ref Code",9.99,9, "EEM ISO EEM Maintainer(999999501)",
"11/18/2014 15:43:31", "Generic Comments May be on multiple lines"
```

4. Appendix A. Web Service Client – Java

Java code can be derived from the WADL and its XSD files. This is an example that shows the steps to have your application validate your customer certificate with ISOs Single Sign-On system so you can communicate with the EEM Application.

4.1 Prerequisites for creating application code

- Download and install a tool like “Wadl2Java” from Glassfish - <https://wabl.java.net/>
- Convert the Wadl and XSD into java code:
 - `wadl2java <-xjcArgument binding.xjc> -p <package> -o <directory for code> application.wadl eem.xsd`
- Create your code for managing your measure details.
- Create a Trust Store with the Server Certificate in it.

Application.wadl and eem.xsd will be part of provided documentation.

Note: To run the sample you will need to supply some parameters to the code when running it.

In the sample code (which uses the wadl2java generated code), the <package> was defined as “com.isone.testing.eem.webservices”.

4.2 Code Sample

This is unsupported code and is provided as a functional reference only

```
/**
 *
 * Copyright 2015 ISO New England, Inc. All Rights Reserved.
 *
 * This code is provided as an example and is not supported by ISO New England.
 */
package com.isone.testing.eem.tool;

import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.SocketException;
import java.net.URI;
import java.net.URL;
import java.security.KeyStore;
import java.security.SecureRandom;
import java.util.ArrayList;
import java.util.List;
import java.util.Properties;

import javax.net.ssl.HttpURLConnection;
import javax.net.ssl.KeyManagerFactory;
import javax.net.ssl.SSLContext;
import javax.net.ssl.SSLSocketFactory;
import javax.net.ssl.TrustManagerFactory;
```

```

import com.isone.testing.eem.webservices.CAMSWebServices;
import com.isone.testing.eem.webservices.MeasureType;
import com.isone.testing.eem.webservices.MeasuresType;
import com.sun.jersey.api.client.Client;
import com.sun.jersey.client.apache4.config.ApacheHttpClient4Config;
import com.sun.jersey.client.apache4.config.DefaultApacheHttpClient4Config;
import com.sun.jersey.client.urlconnection.HTTPURLConnectionFactory;
import com.sun.jersey.client.urlconnection.URLConnectionClientHandler;

/**
 * @author msoffen
 *
 */
public class SampleTestingCode {
    static DefaultApacheHttpClient4Config config = null;
    private static Client client = null;
    static URI webserviceHostname = null;

    static protected String applicationHost = null;
    static protected String applicationURL = null;

    public SampleTestingCode() throws Exception {
    }

    private static String initializeParameter(String propertyName,
        String defaultValue, Boolean setProperty) {
        String value = null;
        if (System.getProperty(propertyName) != null) {
            value = System.getProperty(propertyName);
        } else {
            value = defaultValue;
            if (setProperty == true) {
                if (defaultValue != null) {
                    System.setProperty(propertyName, defaultValue);
                }
            }
        }
        return value;
    }

    protected static String toString(MeasureType mt) {
        String returnStr = "\n";

        if (mt != null) {
            returnStr += "Asset Id -> " + mt.getAssetId() + "\n";
            returnStr += "Asset Name -> " + mt.getAssetName() + "\n";
            ;
            returnStr += "Date Effective -> " + mt.getDateEffective() + "\n";
            returnStr += "Date Expires -> " + mt.getDateExpires() + "\n";
            returnStr += "Load Zone Id -> " + mt.getLoadZoneId() + "\n";
            returnStr += "Load Zone Name -> " + mt.getLoadZoneName() + "\n";
            returnStr += "Measure Id -> " + mt.getMeasureId() + "\n";
            returnStr += "Measure Name -> " + mt.getMeasureName() + "\n";
            returnStr += "Resource Id -> " + mt.getResourceId() + "\n";
            returnStr += "Resource Name -> " + mt.getResourceName() + "\n";
        } else {
            returnStr += "<NULL>\n";
        }
        return returnStr;
    }

    private static SSLSocketFactory getFactory() throws Exception {
        final String clientCertificateFilename = System
            .getProperty("javax.net.ssl.keyStore");

        final String clientCertificatePassword = System
            .getProperty("javax.net.ssl.keyStorePassword");
    }
}

```

```

KeyManagerFactory keyManagerFactory = KeyManagerFactory
    .getInstance("SunX509");
KeyStore keyStore = KeyStore.getInstance("PKCS12");

InputStream keyInput = new FileInputStream(clientCertificateFilename);
keyStore.load(keyInput, clientCertificatePassword.toCharArray());
keyInput.close();

keyManagerFactory.init(keyStore,
    clientCertificatePassword.toCharArray());

SSLContext context = SSLContext.getInstance("TLS");
context.init(keyManagerFactory.getKeyManagers(), null,
    new SecureRandom());

return context.getSocketFactory();
}

public static void main(String[] args) throws Exception {

    System.setProperty("sun.security.ssl.allowUnsafeRenegotiation", "true");
    System.setProperty("jsse.enableSNIExtension", "false");

    List<String> filenames = new ArrayList<String>();
    for (int i = 0; i < args.length; i++) {
        try {
            String[] keyvals = args[i].split("=");
            String key = keyvals[0];
            key = key.replace("-D", "");
            String value = keyvals[1];
            System.out.println(key + ":" + value);
            System.setProperty(key, value);
        } catch (Exception ex) {
            filenames.add(args[i]);
        }
    }

    // App Server Setup - Use Sandbox if they don't supply a server..
    applicationHost = initializeParameter("eem.application.server",
        "https://sandboxsmd.iso-ne.com", true);
    applicationURL = initializeParameter("eem.application.path",
        "/CAMs/eem/api", true);

    webserviceHostname = new URI(applicationHost + applicationURL);

    final String clientCertificateFilename = System
        .getProperty("javax.net.ssl.keyStore");

    final String clientCertificatePassword = System
        .getProperty("javax.net.ssl.keyStorePassword");

    final String serverCertificateStoreFilename = System
        .getProperty("javax.net.ssl.trustStore");

    final String serverCertificateStorePassword = System
        .getProperty("javax.net.ssl.trustStorePassword");

    // If you don't need to use a Proxy Server, This code can be removed
    final String proxyUser = System.getProperty("http.proxyUser");
    final String proxyHost = System.getProperty("http.proxyHost");

    Integer iproxyPort = null;
    try {
        iproxyPort = Integer.valueOf(System.getProperty("http.proxyPort"));
    } catch (java.lang.NumberFormatException ex) {
        iproxyPort = null;
    }

    final Integer proxyPort = iproxyPort;

```

```

final String proxyPassword = System.getProperty("http.proxyPass");

if (proxyHost != null) {
    System.out.println("RestClient: "
        + "Creating Rest Client through proxy (" + proxyHost + ":"
        + proxyPort + ") .");
} else {
    System.out.println("RestClient: "
        + "Creating Rest Client without proxy...");
}

System.out.println("Creating new Client4Config...");
config = new DefaultApacheHttpClient4Config();

if (proxyHost != null && proxyHost.isEmpty() == false) {
    System.out.println("RestClient: " + "Setting Proxy URL : https://"
        + proxyHost + ":" + proxyPort);

    config.getProperties().put(
        ApacheHttpClient4Config.PROPERTY_PROXY_URI,
        "https://" + proxyHost + ":" + proxyPort);
    config.getProperties().put(
        ApacheHttpClient4Config.PROPERTY_PROXY_USERNAME, proxyUser);
    config.getProperties().put(
        ApacheHttpClient4Config.PROPERTY_PROXY_PASSWORD,
        proxyPassword);
}

File pKeyFile = new File(clientCertificateFilename);
File certKeyFile = new File(serverCertificateStoreFilename);

SSLContext context = null;
TrustManagerFactory tmf = null;

// try {
KeyManagerFactory keyManagerFactory = KeyManagerFactory
    .getInstance("SunX509");

// ----- Site Certificate (camsappd.iso-ne.com) ----- //
KeyStore siteKeystore = KeyStore.getInstance(KeyStore.getDefaultType());
InputStream siteKeyInput = new FileInputStream(certKeyFile);

siteKeystore.load(siteKeyInput,
    serverCertificateStorePassword.toCharArray());
siteKeyInput.close();

tmf = TrustManagerFactory.getInstance(TrustManagerFactory
    .getDefaultAlgorithm());
tmf.init(siteKeystore);

keyManagerFactory.init(siteKeystore,
    serverCertificateStorePassword.toCharArray());

KeyStore certificateKeystore = KeyStore.getInstance("PKCS12");

InputStream keyInput = new FileInputStream(pKeyFile);

certificateKeystore.load(keyInput,
    clientCertificatePassword.toCharArray());
keyInput.close();

keyManagerFactory.init(certificateKeystore,
    clientCertificatePassword.toCharArray());

context = SSLContext.getInstance("TLS");

context.init(keyManagerFactory.getKeyManagers(),
    tmf.getTrustManagers(), //
    null);

```

```

HttpURLConnectionFactory connectionFactory = new HttpURLConnectionFactory() {
    @Override
    public HttpURLConnection getHttpURLConnection(URL url)
        throws IOException {
        String destURL = url.getProtocol() + "://" + url.getHost()
            + url.getPath();
        System.out.println("RestClient: "
            + "Trying to get - getHttpURLConnection(" + destURL
            + ")");

        Properties systemProperties = System.getProperties();

        // IP of Proxy Server
        if (proxyHost != null && proxyHost.isEmpty() == false)
            systemProperties.setProperty("http.proxyHost", proxyHost);

        // Port # of Proxy Server
        if (proxyPort != null)
            systemProperties.setProperty("http.proxyPort",
                String.valueOf(proxyPort));

        // User for Proxy Server - Usually the AD Username.
        if (proxyUser != null && proxyUser.isEmpty() == false)
            systemProperties.setProperty("http.proxyUser", proxyUser);

        // Password for Proxy Server - Usually the AD Password
        if (proxyPassword != null && proxyPassword.isEmpty() == false)
            systemProperties.setProperty("http.proxyPass",
                proxyPassword);

        // Giving - Expecting an HTTPS server, HTTP cannot
        // be cast to javax.net.ssl.HttpURLConnection
        if (!(url.getProtocol().equals("https"))) {
            throw new SocketException("URL Must be https, not '"
                + url.getProtocol() + "' - " + destURL);
        }

        HttpURLConnection connection = //
            (HttpURLConnection) url.openConnection();

        try {
            connection.setSSLSocketFactory(getFactory());
        } catch (Exception e) {
            System.out
                .println("httpConnectionFactory: Ugh -
Failures - "
                    + e.getMessage());

            e.printStackTrace();
        }

        connection.setRequestProperty("Content-type", "text/xml");

        connection.setDoOutput(true);
        connection.setDoInput(true);

        return connection;
    }
};

client = new Client(new URLConnectionClientHandler(connectionFactory),
    config);

client.setFollowRedirects(true);

MeasuresType mdc = null;
try {
    mdc = CAMSWebServices.measure(client,
        webserviceHostname.normalize()).getAsMeasuresTypeXml();
}

```

```

    } catch (Exception ex) {
        System.out
            .println("ERROR: "
                + "Received Exception when retrieving
measure.getAsMeasuresTypeXml() -> "
                + ex.getMessage());
        ex.printStackTrace();
        throw new Exception(ex);
    }
    for (int i = 0; i < mdc.getMeasure().size(); i++) {
        System.out.println("mdc[" + i + "] = "
            + toString(mdc.getMeasure().get(i)));
    }
}
}

```

5. Customer Support

5.1 By Internet



<http://www.iso-ne.com/participate/support>

5.2 By Telephone



Days of Operation

During Regular Business Hours, Monday through Friday: 8:00 A.M. to 5:00 P.M. ET:
(413) 540-4220

The Customer Support Hotline is **NOT** staffed on the following days:

New Year's Day	Labor Day
Martin Luther King Day	Columbus Day
Presidents Day	Veterans Day
Good Friday	Thanksgiving Day
Patriots Day	Day After Thanksgiving
Memorial Day	Christmas Eve Afternoon (12:00 to 17:00)
Independence Day	Christmas Day

For after-hours business emergencies, contact Customer Support at **(877) 226-4814** (pager).

5.3 By Email



custserv@iso-ne.com

5.4 Ask ISO



Ask ISO is available to market participants who have a valid digital certificate and who have been assigned the role of “Ask ISO / External User” by their Security Administrator. Ask ISO is located at:

<http://www.iso-ne.com/about/contact/customer-support>

6. Links

6.1 ISO New England Home Page

<http://www.iso-ne.com>

6.2 ISO New England Training Page

<http://www.iso-ne.com/participate/training>

6.3 ISO New England FAQ Page

<http://www.iso-ne.com/participate/support/faq>

6.4 SMD Site for ISO Applications

<https://smd.iso-ne.com/>

6.5 SMD Site for ISO Sandbox Applications

<https://sandboxsmd.iso-ne.com/>

6.6 ISO New England Glossary and Acronyms

<http://www.iso-ne.com/participate/support/glossary-acronyms>

7. Reference Tables

7.1 Table 1: EEM Security Roles

CAMS Role	Activities Allowed	Pertinent Sections in User Guide
External EEM Viewer	<ul style="list-style-type: none"> • Search for data for any Measure Detail that the Lead Participant owns. • View data for any Measure Detail that the Lead Participant owns. 	<ul style="list-style-type: none"> • “Customer Web Service” (page 12). • “End Use Web Service” (page 13). • “Lead Market Participant Web Service” (page 13). • “All or Single Measure Web Service” (page 14). • “Measure Detail Web Service” (page 16). • “Measure Detail History Web Service” (page 17). • “Pending Measure Details Web Service” (page 20). • “Current and Pending Measure Detail Web Service” (page 21). • “Search Specific Measure Detail Web Service” (page 33).
External EEM Maintainer	<ul style="list-style-type: none"> • Upload/update data for any Measure Detail that the Lead Participant owns. • Search for data for any Measure Detail that the Lead Participant owns. • View data for any Measure Detail that the Lead Participant owns. 	<ul style="list-style-type: none"> • “Customer Web Service” (page 12). • “End Use Web Service” (page 13). • “Lead Market Participant Web Service” (page 13). • “All or Single Measure Web Service” (page 14). • “Measure Detail Web Service” (page 16). • “Measure Detail History Web Service” (page 17). • “Pending Measure Details Web Service” (page 20). • “Current and Pending Measure Detail Web Service” (page 21). • “Create New Measure Detail Web Service” (page 24). • “Cancel Pending Measure Web Service” (page 30). • “Update Measure Detail Web Service” (page 31). • “Search Specific Measure Detail Web Service” (page 33).