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Interface Control Document

HES – ORACLE MDM SGG INTEGRATION

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Interface Control Document

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1.3	27-09-2018	Review the change	Giza - Sahar Akle

Reference Documents

Please see the following documents for more information:

Document Name	Version	Author
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1 Introduction

This document describes the interface specifications for the integration between HES and Oracle Meter Data Management and Smart Grid Gateway.

The integration will cover different use-cases of an AMI infrastructure and will be based on Multispeak 4.1 standard.

It is a bi-directional workflow where the HES will provide data to the MDMS and the MDMS will send command to the HES.

The integration is based on a Service Oriented Architecture (SOA) as per Multispeak specifications.

1.1 Purpose

This document describes the interface requirements to be met by both Oracle MDM/SGG and HES systems. For each interfaces and for each use case a sequence diagram is provided together with the description of the web-service associated (WSDL) and the payload format (XSD).

1.2 System Identification

The document describes the interfaces for the integration between Oracle Utility MDM and HES systems.

Oracle Utilities MDM gathers and processes data from any type, variety, or brand of device. The application loads, validates, stores, and formats the data in ways that facilitate business processes across multiple internal and external systems. Oracle Utilities MDM includes standard functionality for aggregations, event subscriptions, usage subscriptions, bill determinants (supporting the push and pull methods), and smart meter transition processes.

HES System usually is a modern and modular solution featuring Head End capabilities. Is a scalable, process-oriented platform for on-demand or scheduled reading from metering devices, configuring devices and metering data management with many customization options. Is composed by a set of windows services with a single GUI for system configuration and additional flexible Web UI (localizable to Arabic) for easy day-to-day AMI operations.

2 Interface Definition

2.1 System Overview

In the AMI architecture HES is the system that directly communicate with the meters or concentrators to collect data regarding consumption, events, alarms and device status. Additionally, HES execute the commands that receive from the integrated MDM as connection, disconnection, commissioning and decommissioning. MDMS is the system that, through its module Smart Grid Gateway (SGG), collect from HES the consumption data, performs validation and estimation and make the data available for CIS system and other systems that can require this type of data. Additionally, MDM, usually driven by the integrated CIS system, send command to HES to control the devices.

2.2 Interface Overview

The use cases of the integration between HES and MDM/SGG are the following:

- Commissioning
- Decommissioning
- Connection
- Disconnection
- Scheduled Meter Reads and Events
- Alarms
- On-demand Meter Reading
- Device status

2.3 Operations

There are three type of operations that can be configured in an integration between MDM and HES:

- **Scheduled operations:** (I.e.: scheduled meter readings and events). Operations that are scheduled on HES. HES send to MDM the data requested.
- **Commands:** (I.e.: Connection/Disconnection). Commands that MDM send to HES. Some commands they receive a response in synchronous way for some others HES send an ack and when the operation is completed communicate to MDM the requested data.
- **Notifications:** (I.e.: Alarms). Information that HES communicates to MDM without a request.

Depending on operation, these integration use cases are performed using web-services and files as communication protocol the below table shows:

Protocol	Operation	Communication
Multispeak	Scheduled	File
Multispeak	Commands	Web-Service
Multispeak	Notifications	File

Table 1 Operations

3 Multispeak Interface Specifications

This chapter describe the interfaces of the integration based on the international standard Multispeak.

For each use case, a sequence diagram illustrates the flow of the integration, one or more WSDL define the interfaces exposed by the two systems and, one or more XSD define the payload format of each web-service.

3.1 Technical specifications

3.1.1 Multispeak Specifications

MultiSpeak is based on SOAP-style web services. It also supports batch file transfers where desirable. Each web service endpoint is defined as an abstract software function that may be implemented by one or more software applications in a utility. Web services are defined using standard WSDL contracts.

The version of the standard object of this document is Multispeak 4.1. Because SOAP web-services are defined using WSDL contracts that defines the contract between client and service and are static by their nature, backward compatibility cannot be assured.

Following an extraction from Multispeak official documentation:

There should be no expectation that Version 5.0 is backward compatible with Version 4.1 or 3.0. Similarly, a future Version 6.0 will not be constrained to be backward compatible with Version 5.X.

3.1.2 Integration Flow

All the Multispeak use cases, object of this document, are carried out through web-services except Scheduled Meter Reads and Events and Alarms that are managed through file.

There are three different type of data flows in Multispeak protocol:

- SGG synchronous request to HES.
- SGG asynchronous request to HES.
- HES synchronous communication to SGG.

SGG synchronous request to HES

The SGG synchronous requests are sent for the below use cases:

- Commissioning
- Decommissioning

The SGG send a request to the HES and receive a response containing the outcome of the operation.

SGG asynchronous request to HES

The SGG asynchronous requests are sent for the below use cases:

- Connection
- Disconnection
- Device Status
- On-Demand Meter Reading

The SGG send a request to the HES and receive a response containing the acknowledgement.

The HES perform the operation requested and send the response to SGG with the outcome of the request, invoking a web-service exposed by SGG.

In the response message, for each meter, there is the outcome of the operation requested and in case of failure the error message.

HES synchronous communication to SGG

The HES synchronous requests are sent for the below use cases:

- Scheduled Meter Reads and Events
- Alarms

The HES publish a file containing meter readings, events and alarm. SGG reads the file and acquire the data in its database.

3.1.3 Messages Structure

The structure of Multispeak message are different for messages that are sent to HES and messages that are sent to SGG. Each operation has two different messages:

- Request
- Response

Each message is formed by a header common to all message and a body.

Below an example of Multispeak message:

```
<soapenv:Header>
  <ver:MultiSpeakMsgHeader MajorVersion="?" MinorVersion="?" Build="?" Branch="?" BuildString="?"
  UserID="?" Pwd="?" AppName="?" AppVersion="?" Company="?" DefaultCurrencyCode="?"
  CSUnits="feet" CoordinateSystemName="?" CoordinateSystemAuthority="?"
  CoordinateSystemAuthorityCode="?" Datum="?" SessionID="?" PreviousSessionID="?"
  ObjectsRemaining="?" LastSent="?" RegistrationID="?" MessageID="?" TimeStamp="?" Context="?"
  AuditID="?" AuditPassword="?" />
</soapenv:Header>
```

```

<soapenv:Body>
  <ver:InitiateMeterReadingsByMeterID>
    <!--Optional:-->
    <ver:meterIDs>
      <!--Zero or more repetitions:-->
      <ver:meterID meterNo="?" serviceType="?" objectID="?" utility="?"></ver:meterID>
    </ver:meterIDs>
    <!--Optional:-->
    <ver:responseURL?></ver:responseURL>
    <!--Optional:-->
    <ver:transactionID?></ver:transactionID>
    <!--Optional:-->
    <ver:expTime units="?"></ver:expTime>
  </ver:InitiateMeterReadingsByMeterID>
</soapenv:Body>

```

3.1.4 MeterID

A relevant field for each web-service is the MeterID.

From Multispeak official documentation:

The meterID is a hard, noun-specified identifier, thus is more nearly of the same form as an objectRef, not an objectID.

In other words, is a unique identifier for the meter that will be used in the communication between MDM/SGG and HES. It can contains any type of identifier (Meter Number, Serial Number etc.). Each vendor can decide its own identifier.

In MDM/SGG the MeterID is stored as externalID.

3.1.5 Error Handling

In the response message a list of errorObjects will be used to notify the errors happened.

See [§5 Annex B Payloads Examples](#) for examples of how response payloads are formed.

There are different categories of errors:

- Errors in request-response messages.

- Errors in publish-subscribe messages.
- Errors in Asynchronous Recall Messages.
- Subscription Error Messages.
- Errors that Applies to All Messages.
- Errors Specific to Meter Reading Messages.

Please refer to Multispeak official documentation for the list of errors of each category.

3.1.6 Security

Web Services message structure shall be XML/SOAP/WS-Security 1.0 with AES-256 encryption.

3.2 Multispeak Web-Services

To implement the integration based on Multispeak standard, both HES and SGG will expose some web-services. Below the web-services list:

- **MR_Server**: Used during Commission/Decommission and OnDemandRead operations.
- **CB_Server**: Used by the asynchronous callback processes of OnDemandRead and Connect/Disconnect.
- **CD_Server**: Used by Connect/Disconnect.
- **OA_Server**: Used when the asynchronous reply in DeviceStatusCheck arrives.
- **OD_Server**: Used in DeviceStatusCheck.

Each one contains one or more operations:

Web-Service	Exposed by	Operations	Use Cases
MR_Server	HES	AddMeterNotification RemoveMeterNotification InitiateMeterReadingsByMeterID	Commissioning Decommissioning On-Demand Meter Reading
CB_Server	SGG	CDStateChangedNotification CDStatesChangedNotification ReadingChangedNotification	Connection Disconnection On-Demand Meter Reading
CD_Server	HES	InitiateConnectDisconnect	Connection Disconnection
OA_Server	SGG	ODEventNotification	Device Status
OD_Server	HES	InitiateOutageDetectionEventRequest	Device Status

Table 2 Multispeak Web-Services

See [§4 Annex A Multispeak Web-Services](#) for the complete web-service WSDL and payload XSD definition of each web-service.

For Commissioning, Decommissioning, Connection and Disconnection the web-services will be invoked on the HES with only one meter. The Multispeak standard allows a list of meters but Oracle SGG handles it as a single command for each meter.

The Commissioning will be invoked after meter Installation and can be followed by a connection command depending on the value of field meterConnectionStatus passed in the MeterAddNotification web-service. For more detail see chapter [§5.1 MeterAddNotification \(Commissioning\)](#).

3.2.1 MR_Server

Below the schema of the operations included in this web-service. See [§4.1 MR_Server](#) for the complete source code.

Namespace	http://www.multispeak.org/Version_4.1_Release												
Type	tns:MR_ServerSoap												
Extensibility	<pre><soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/> <wsp:PolicyReference URI="#wss_username_token_service_policy" wsdl:required="false" xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"/></pre>												
Operations	<p>MeterRemoveNotification</p> <table> <tr> <td>Extensibility</td><td> <pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterRemoveNotification" style="document"/></pre> </td></tr> <tr> <td>Input</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> <tr> <td>Output</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> </table> <p>MeterAddNotification</p> <table> <tr> <td>Extensibility</td><td> <pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterAddNotification" style="document"/></pre> </td></tr> <tr> <td>Input</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> <tr> <td>Output</td><td> <pre><soap:body use="literal"/></pre> </td></tr> </table>	Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterRemoveNotification" style="document"/></pre>	Input	<pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>	Output	<pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>	Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterAddNotification" style="document"/></pre>	Input	<pre><soap:body use="literal"/> <soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>	Output	<pre><soap:body use="literal"/></pre>
Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterRemoveNotification" style="document"/></pre>												
Input	<pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>												
Output	<pre><soap:body use="literal"/> <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>												
Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/MeterAddNotification" style="document"/></pre>												
Input	<pre><soap:body use="literal"/> <soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>												
Output	<pre><soap:body use="literal"/></pre>												

		<pre><soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
InitiateMeterReadingsByMeterID		
Extensibility		<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateMeterReadingsByMeterID" style="document"/></pre>
Input		<pre><soap:body use="literal"/> <soap:header message="tns:InitiateMeterReadingsByMeterIDMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
Output		<pre><soap:body use="literal"/> <soap:header message="tns:InitiateMeterReadingsByMeterIDMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
Used by	Service	tns:MR_Server

Table 3 Multispeak MR_Server web-service schema

MeterRemoveNotification

Publisher notifies MR to remove the associated meter(s).

MR returns information about failed transactions using an array of errorObjects.

The message header attribute 'registrationID' should be added to all publish messages to indicate to the subscriber under which registrationID they received this notification data.

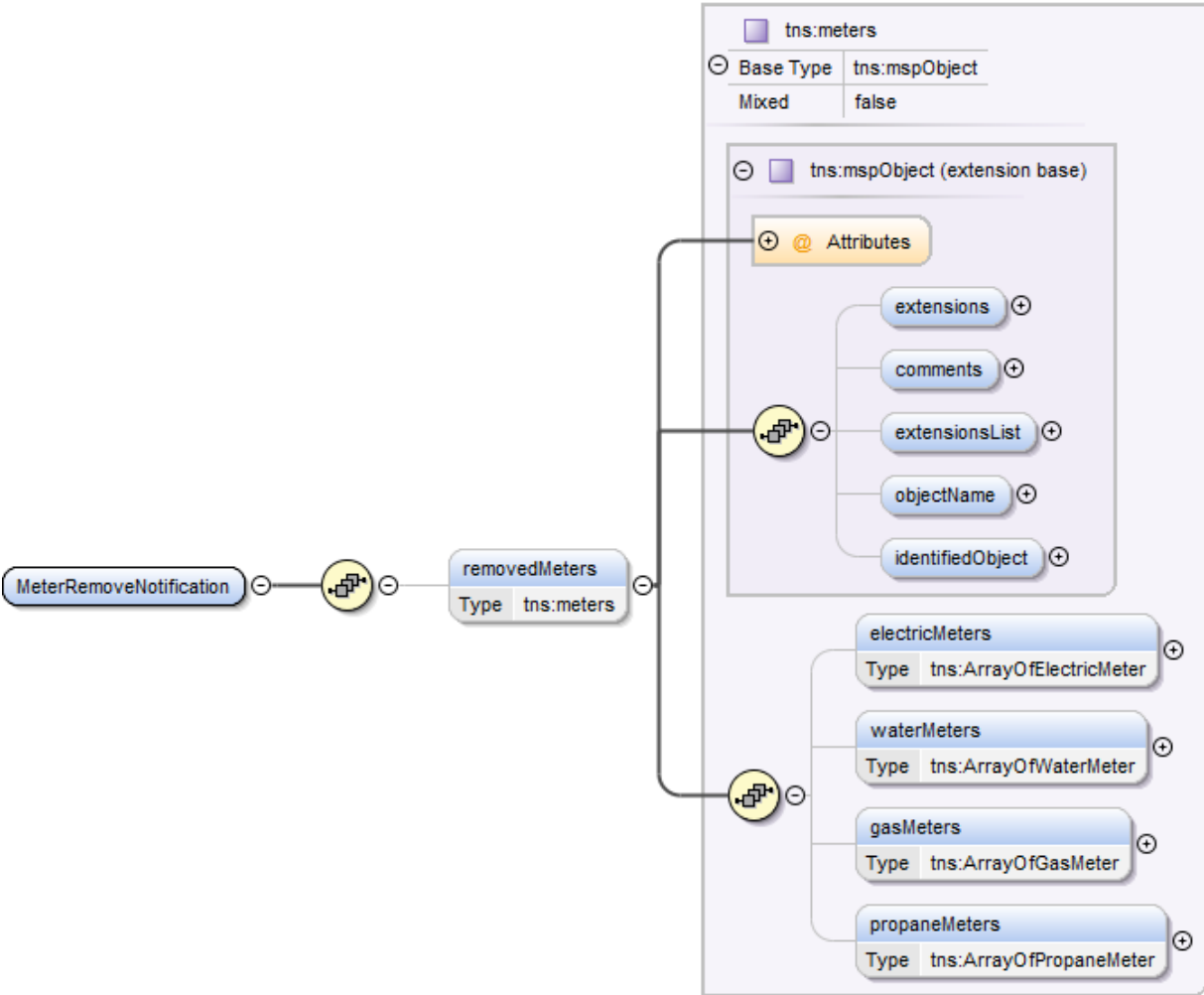


Figure 1 Meter Remove Notification schema

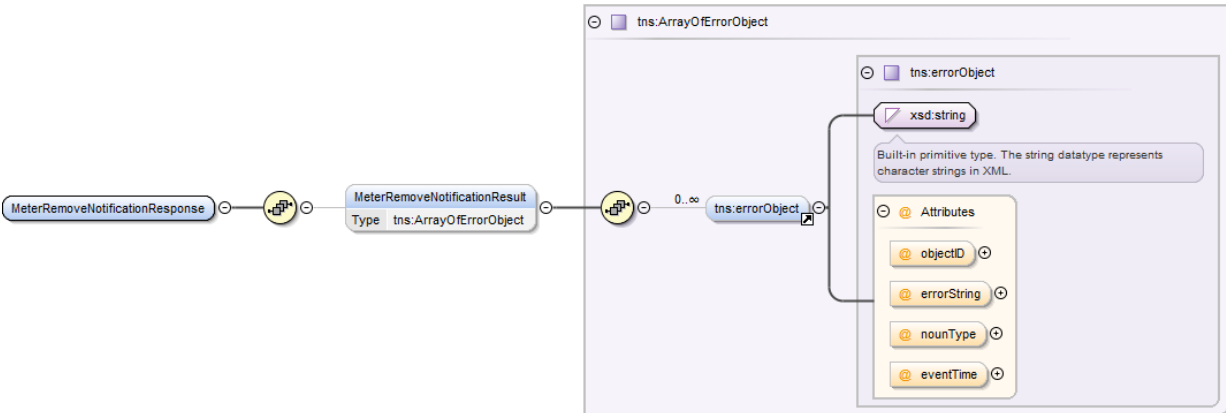


Figure 2 Meter Remove Notification Response schema

MeterAddNotification

Publisher notifies MR to add the associated meter(s).

MR returns information about failed transactions using an array of errorObjects.

The message header attribute 'registrationID' should be added to all publish messages to indicate to the subscriber under which registrationID they received this notification data.

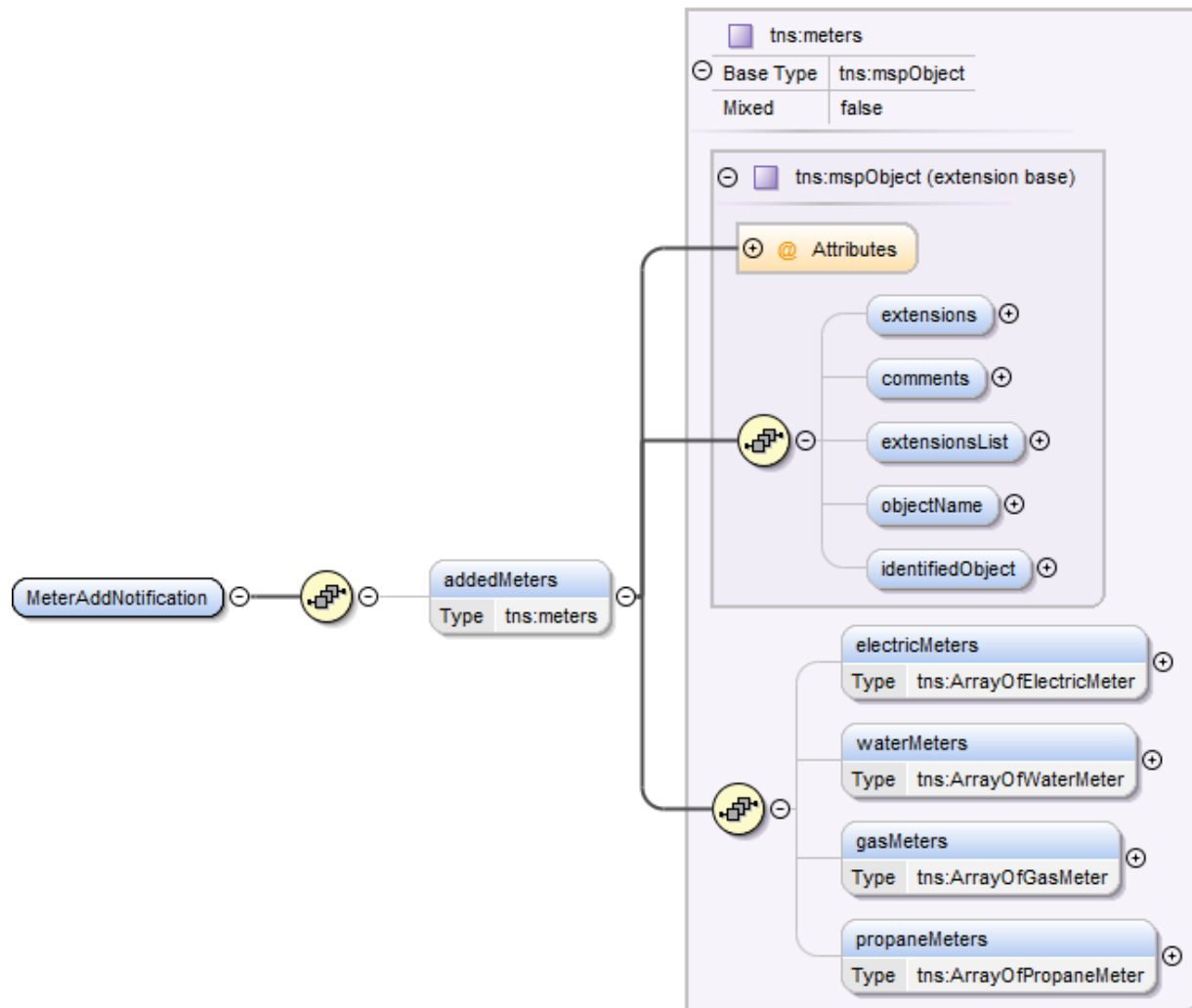


Figure 3 Meter Add Notification schema

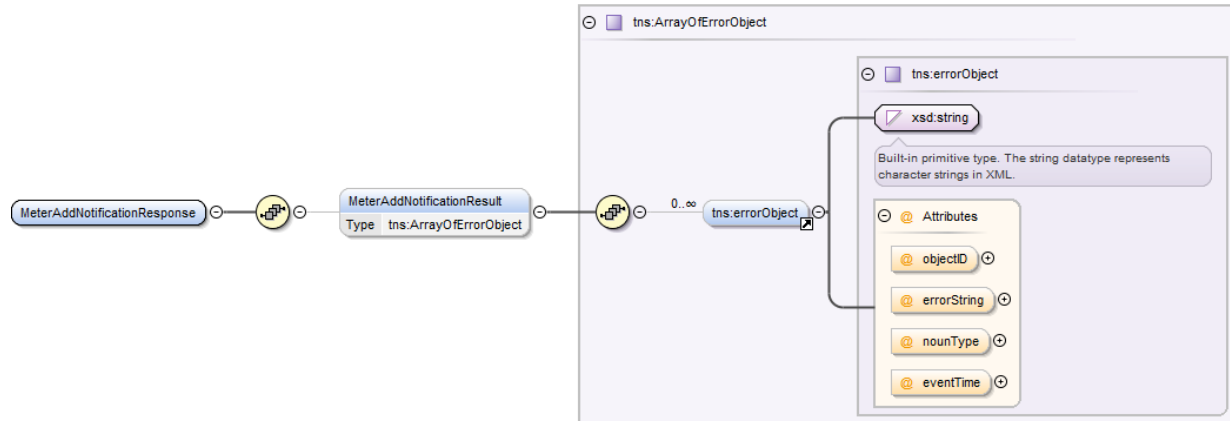


Figure 4 Meter Add Notification Response schema

InitiateMeterReadingsByMeterID

CB requests a new meter reading from MR, on meters selected by meterID.

MR returns information about failed transactions using an array of errorObjects

The meter reading is returned to the CB in the form of a meterReading, an intervalData block, or a formattedBlock, sent to the URL specified in the responseURL.

The transactionID calling parameter links this Initiate request with the published data method call. The expiration time parameter indicates the amount of time for which the publisher should try to obtain and publish the data; if the publisher has been unsuccessful in publishing the data after the expiration time, then the publisher will discard the request and the requestor should not expect a response.

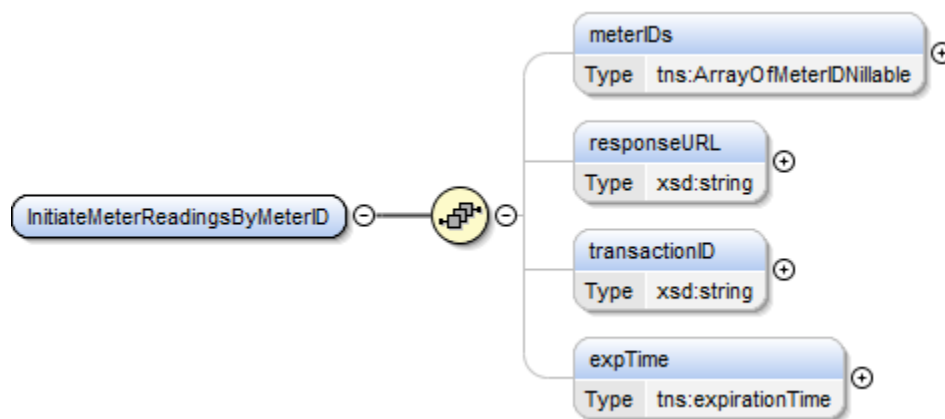


Figure 5 Initiate Meter Readings by MeterID schema

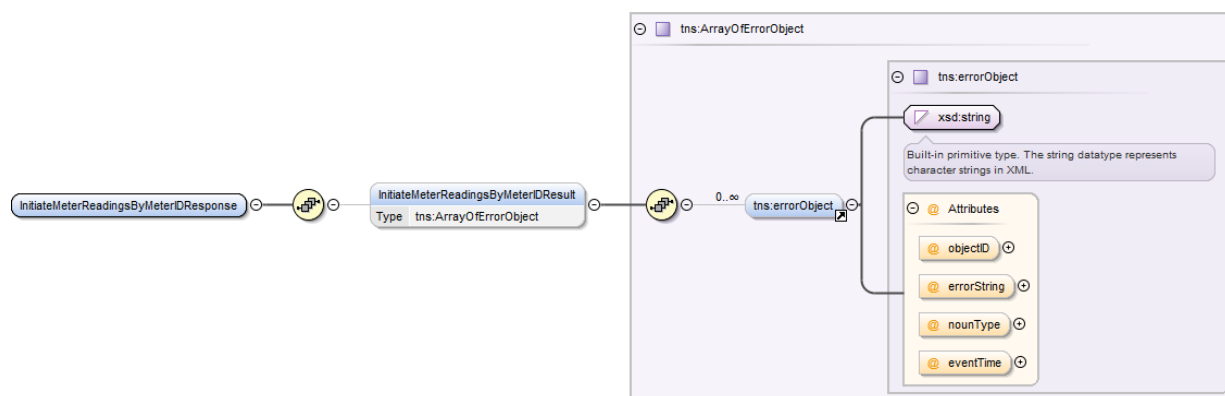


Figure 6 Initiate Meter Readings by MeterID Response schema

3.2.2 CB_Server

Below the schema of the operations included in this web-service. See §4.2 *CB_ServerMR_Server* for the complete source code.

Namespace	http://www.multispeak.org/Version_4.1_Release										
Type	tns:CB_ServerSoap										
Extensibility	<pre><soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/></pre>										
Operations	<p>ReadingChangedNotification</p> <table> <tr> <td>Extensibility</td><td> <pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/ReadingChangedNotification" style="document"/></pre> </td></tr> <tr> <td>Input</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> <tr> <td>Output</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> </table> <p>CDStateChangedNotification</p> <table> <tr> <td>Extensibility</td><td> <pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/CDStateChangedNotification" style="document"/></pre> </td></tr> <tr> <td>Input</td><td> <pre><soap:body use="literal"/> <soap:header message="tns:CDStateChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre> </td></tr> </table>	Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/ReadingChangedNotification" style="document"/></pre>	Input	<pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>	Output	<pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>	Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/CDStateChangedNotification" style="document"/></pre>	Input	<pre><soap:body use="literal"/> <soap:header message="tns:CDStateChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/ReadingChangedNotification" style="document"/></pre>										
Input	<pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>										
Output	<pre><soap:body use="literal"/> <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>										
Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/CDStateChangedNotification" style="document"/></pre>										
Input	<pre><soap:body use="literal"/> <soap:header message="tns:CDStateChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>										

	Output	<pre><soap:body use="literal"/> <soap:header message="tns:CStateChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
	CDStatesChangedNotification	
	Extensibility	<pre><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/CDStatesChangedNotification" style="document"/></pre>
	Input	<pre><soap:body use="literal"/> <soap:header message="tns:CDStatesChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
	Output	<pre><soap:body use="literal"/> <soap:header message="tns:CDStatesChangedNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></pre>
Used by	Service	tns:CB_Server

Table 4 Multispeak CB_Server web-service schema

ReadingChangedNotification

MR Notifies CB of a change in meter readings by sending the changed meterReading objects.

CB returns information about failed transactions in an array of errorObjects.

The transactionID calling parameter links this Initiate request with the published data method call. The message header attribute 'registrationID' should be added to all publish messages to indicate to the subscriber under which registrationID they received this notification data.

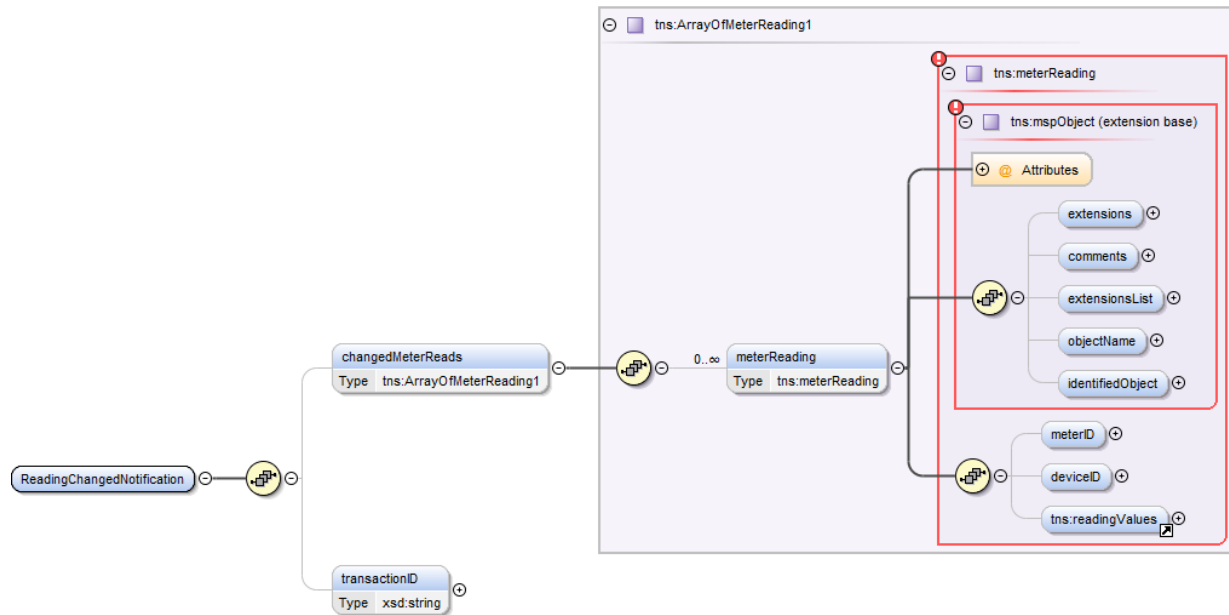


Figure 7 Reading Change Notification schema

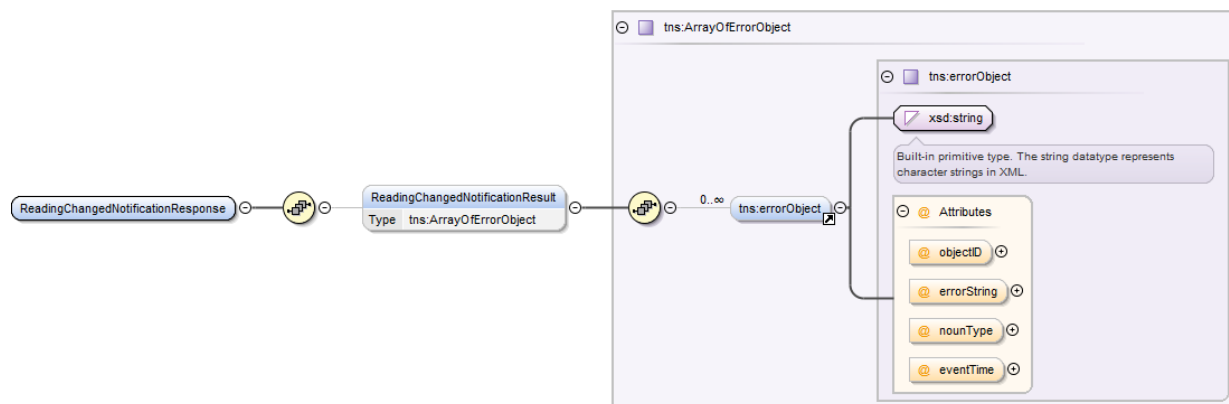


Figure 8 Reading Change Notification Response schema

CDStateChangedNotification

CD notifies CB of state change for a connect/disconnect device by meterID and loadActionCode.

The transactionID calling parameter can be used to link this action with an InitiateConectDisconnect call.

If this transaction fails, CB returns information about the failure in a SOAPFault. The message header attribute 'registrationID' should be added to all publish messages to indicate to the subscriber under which registrationID they received this notification data.

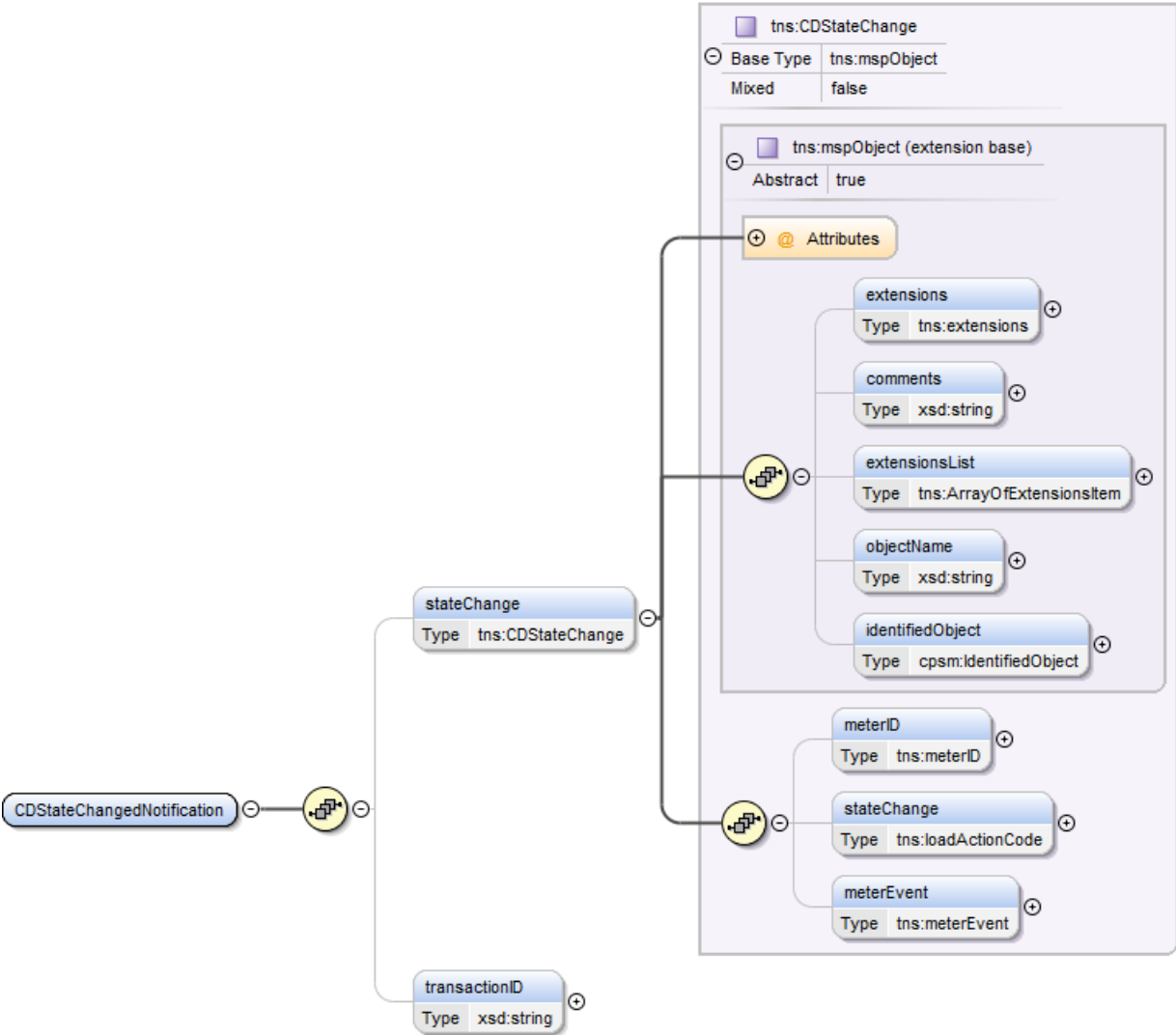


Figure 9 CD State Changed Notification schema

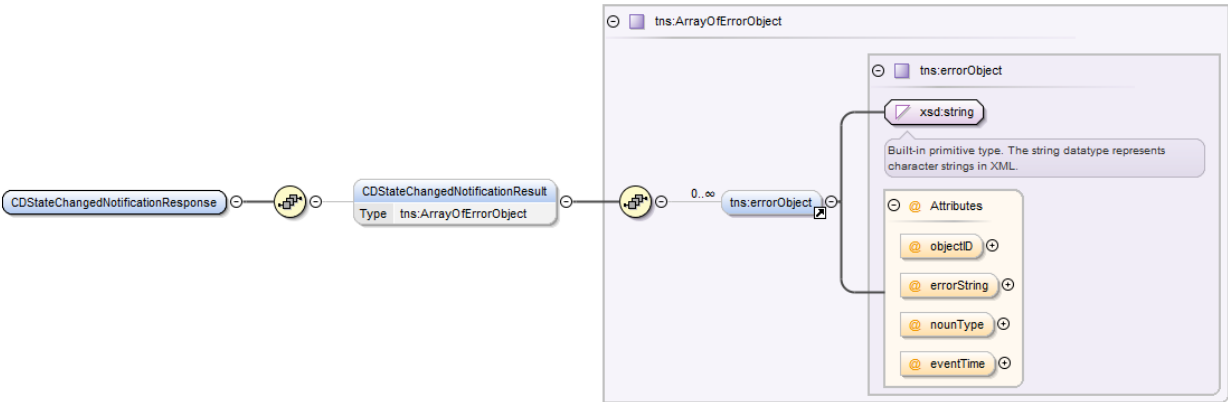


Figure 10 CD State Changed Notification Response schema

CDStatesChangedNotification

CD notifies CB of state change(s) for connect/disconnect device(s).

The transactionID calling parameter can be used to link this action with an InitiateConectDisconnect call. If this transaction fails, CB returns information about the failure in an array of errorObject(s). The message header attribute 'registrationID' should be added to all publish messages to indicate to the subscriber under which registrationID they received this notification data.

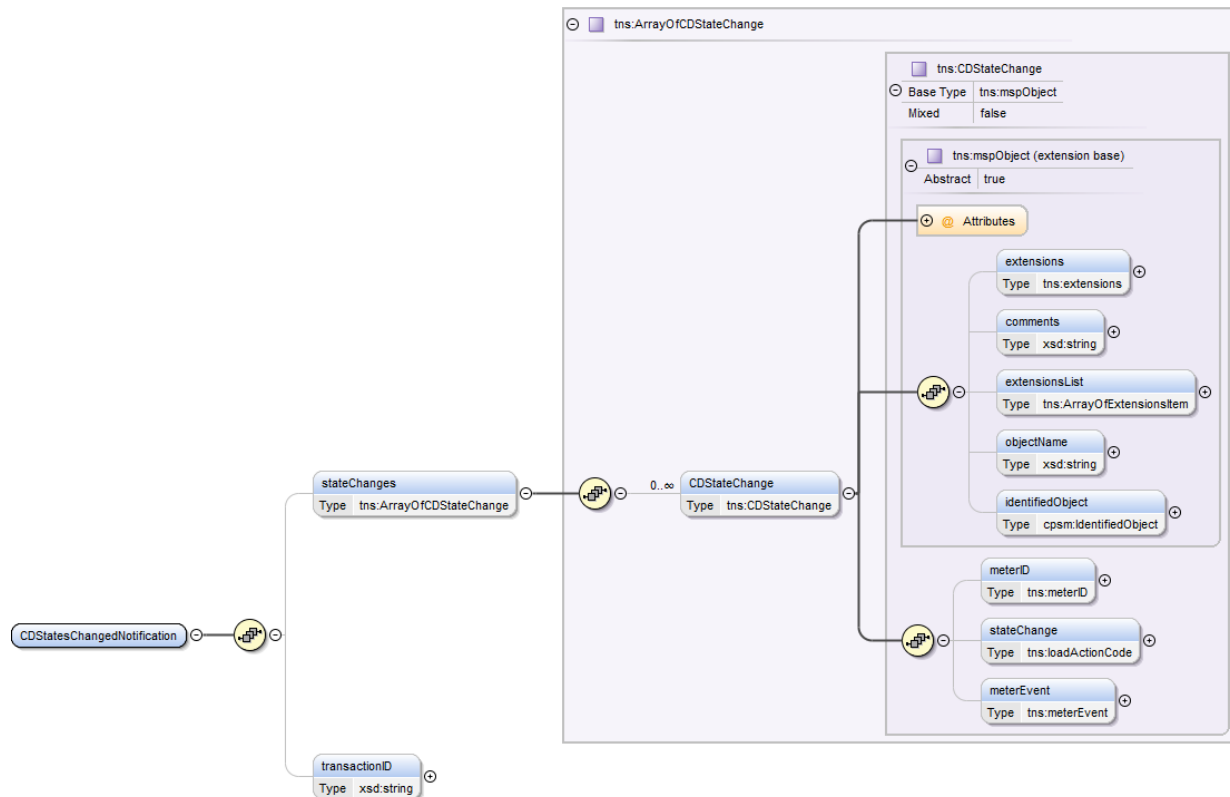


Figure 11 CD States Changed Notification schema

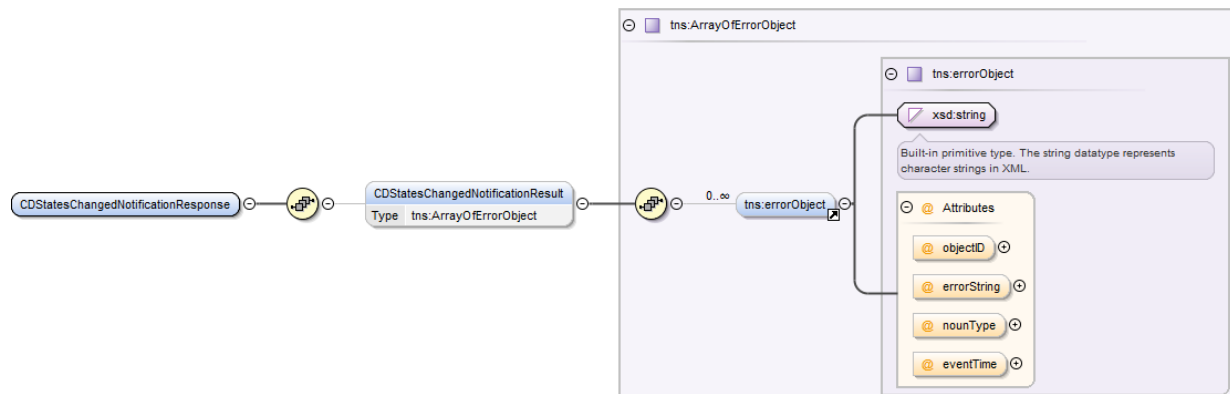


Figure 12 CD States Changed Notification Response schema

3.2.3 CD_Server

Below the schema of the operations included in this web-service. See §4.3 CD_Server for the complete source code.

Namespace	http://www.multispeak.org/Version_4.1_Release		
Type	tns:CD_ServerSoap		
Extensibility	<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>		
Operations	InitiateConnectDisconnect		
	Extensibility	<soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateConnectDisconnect" style="document"/>	
	Input	<soap:body use="literal"/> <soap:header message="tns:InitiateConnectDisconnectMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/>	
	Output	<soap:body use="literal"/> <soap:header message="tns:InitiateConnectDisconnectMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/>	
Used by	Service	tns:CD_Server	

Table 5 Multispeak CD_Server web-service schema

InitiateConnectDisconnect

CB initiates a connect or disconnect action by issuing one or more connectDisconnectEvent objects to the CD.

CD returns information about failed transactions by returning an array of errorObjects.

The connect/disconnect function returns information about this action using the CDStateChangedNotification to the URL specified in the responseURL calling parameter and references the transactionID specified to link the transaction to this Initiate request.

The expiration time parameter indicates the amount of time for which the publisher should try to obtain and publish the data; if the publisher has been unsuccessful in publishing the data after the expiration time, then the publisher will discard the request and the requestor should not expect a response.

For Connection/Disconnection loadActionCode see [§5.3 InitiateConnectDisconnect \(Connection, Disconnection\)](#).

In Multispeak 4.1 is possible to send a disconnection command or a power limitation command. There is no specification for disconnect a single phase, a circuit breaker living the relay on or a single direction of electricity like consumption leaving on the direction of production.

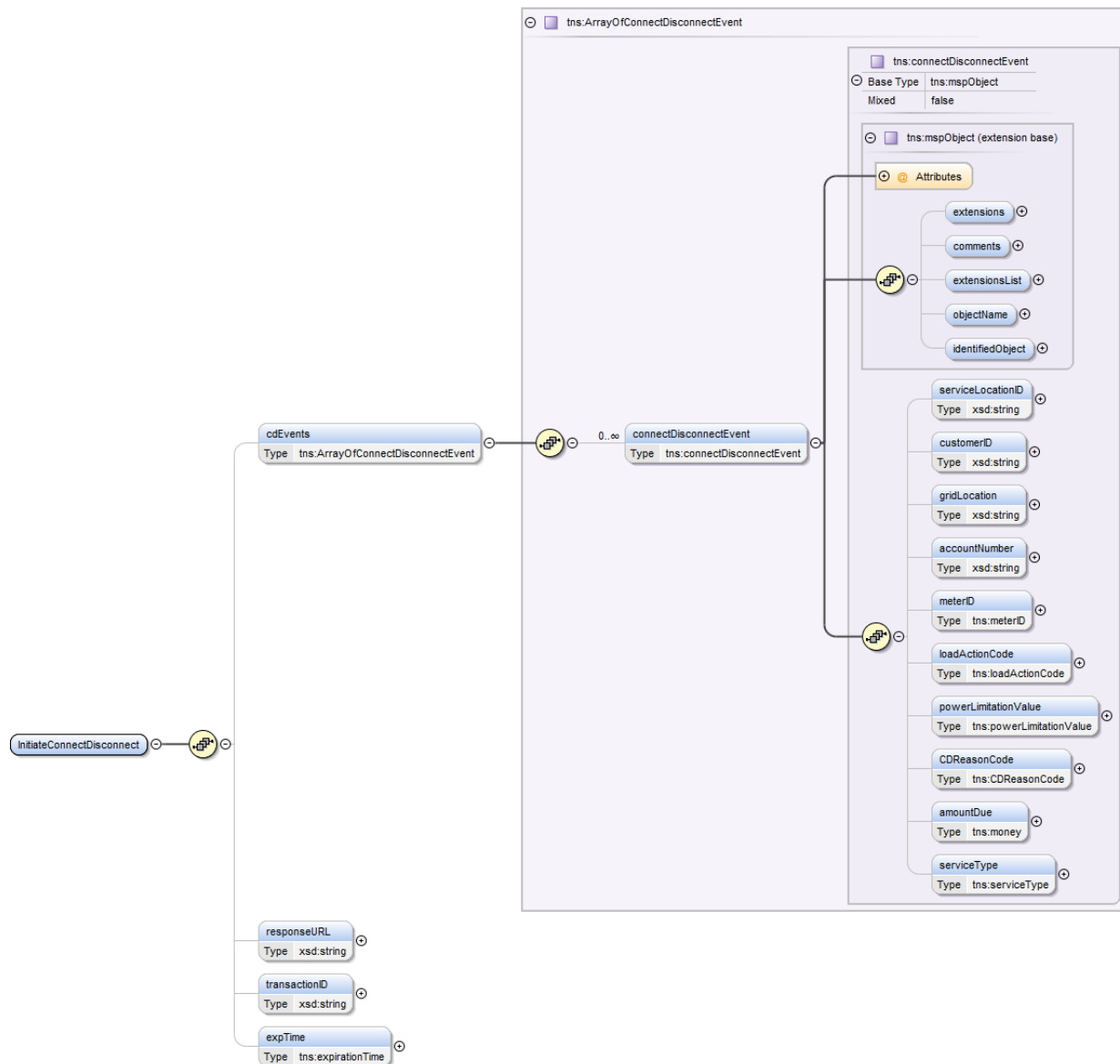


Figure 13 Initiate Connect Disconnect schema

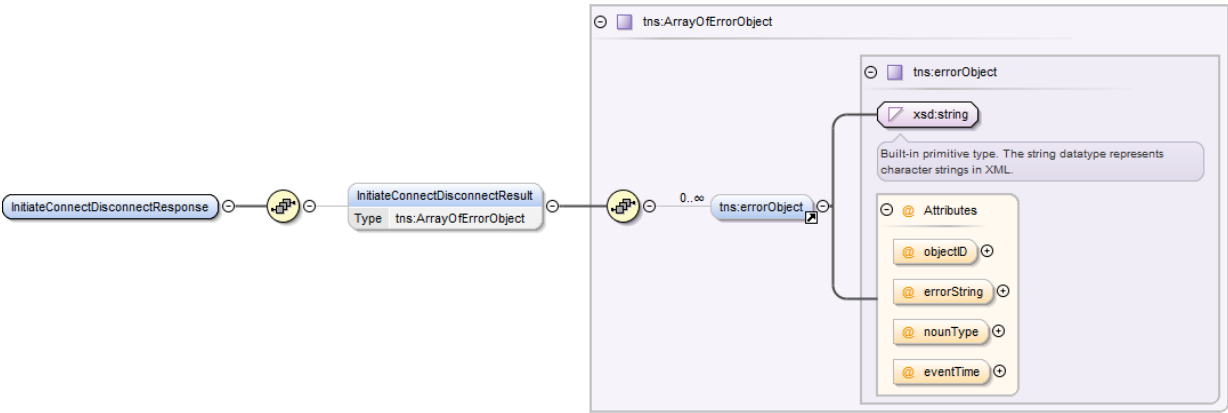


Figure 14 Initiate Connect Disconnect Response schema

3.2.4 OA_Server

Below the schema of the operations included in this web-service. See §4.4 OA_Server for the complete source code.

Namespace	http://www.multispeak.org/Version_4.1_Release
Type	tns:OA_ServerSoap
Extensibility	<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
Operations	ODEventNotification <div>Extensibility <soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/ODEventNotification" style="document"/></div> <div>Input <soap:body use="literal"/> <soap:header message="tns:ODEventNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></div> <div>Output <soap:body use="literal"/> <soap:header message="tns:ODEventNotificationMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></div>
Used by	Service tns:OA_Server

Table 6 Multispeak OA_Server web-service schema

ODEventNotification

Publisher notifies OA of a change in OutageDetectionEvents by sending an array of changed OutageDetectionEvent objects.

OA returns information about failed transactions using an array of errorObjects.

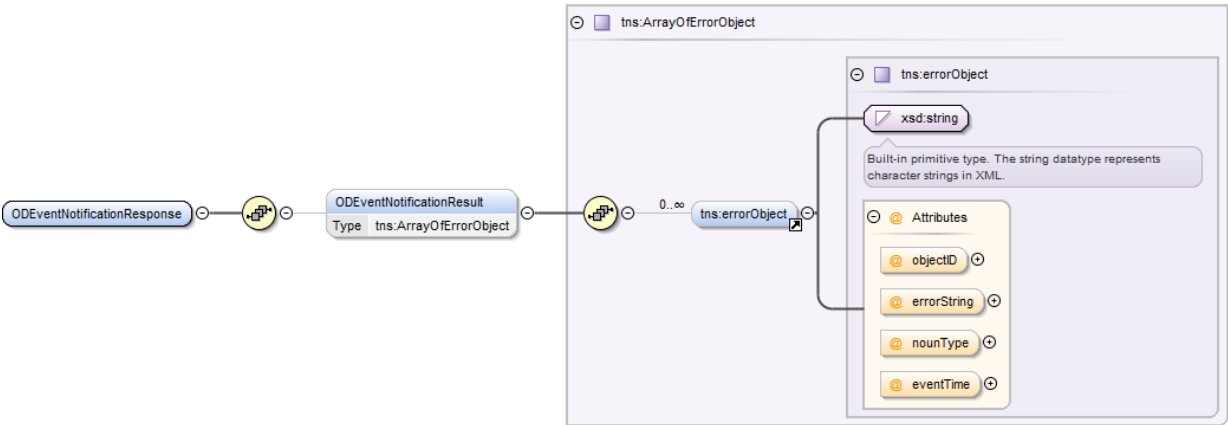


Figure 16 OD Event Notification Response schema

3.2.5 OD_Server

Below the schema of the operations included in this web-service. See §4.5 OD_Server for the complete source code.

Namespace	http://www.multispeak.org/Version_4.1_Release
Type	tns:OD_ServerSoap
Extensibility	<div><soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/> <wsp:PolicyReference URI="#wss_username_token_service_policy" wsdl:required="false" xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"/></div>
Operations	<div>InitiateOutageDetectionEventRequest</div> <div><div>Extensibility</div><div><soap:operation soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateOutageDetectionEventRequest" style="document"/></div><div><div>Input</div><div><soap:body use="literal"/> <soap:header message="tns:InitiateOutageDetectionEventRequestMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></div><div><div>Output</div><div><soap:body use="literal"/> <soap:header message="tns:InitiateOutageDetectionEventRequestMultiSpeakMsgHeader" part="MultiSpeakMsgHeader" use="literal"/></div></div></div></div>
Used by	<div>Service</div> <div>tns:OD_Server</div>

Table 7 Multispeak OD_Server web-service schema

InitiateOutageDetectionEventRequest

Client requests server to update the status of an outageDetectionDevice.

OD responds by publishing a revised outageDetectionEvent (using the ODEventNotification method on OA-OD) to the URL specified in the responseURL parameter.

OD returns information about failed transactions using an array of errorObjects.

The transactionID calling parameter is included to link a returned ODEventNotification with this request. The expiration time parameter indicates the amount of time for which the publisher should try to obtain and publish the data; if the publisher has been unsuccessful in publishing the data after the expiration time, then the publisher will discard the request and the requestor should not expect a response.

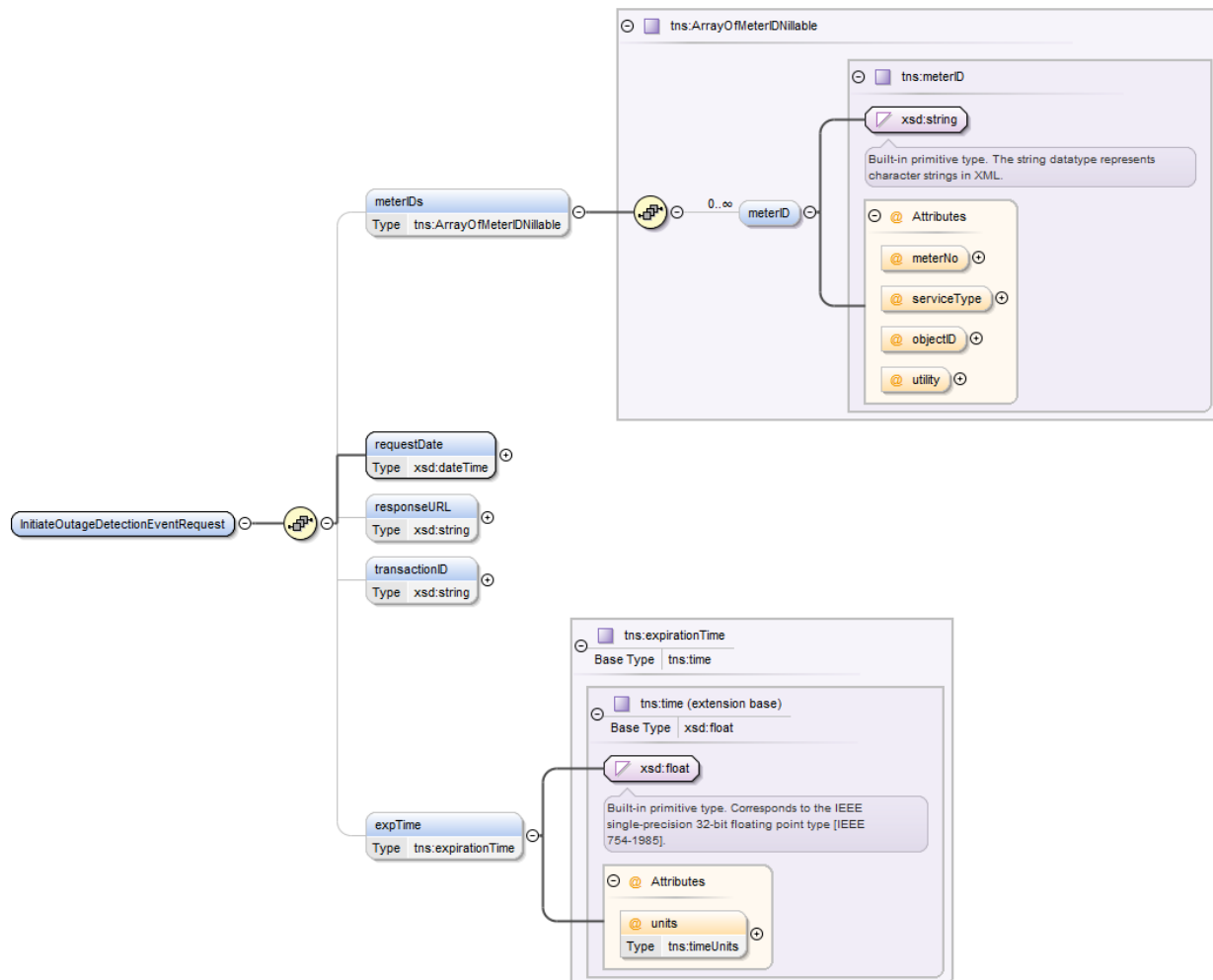


Figure 17 Initiate Outage Detection Event Request schema

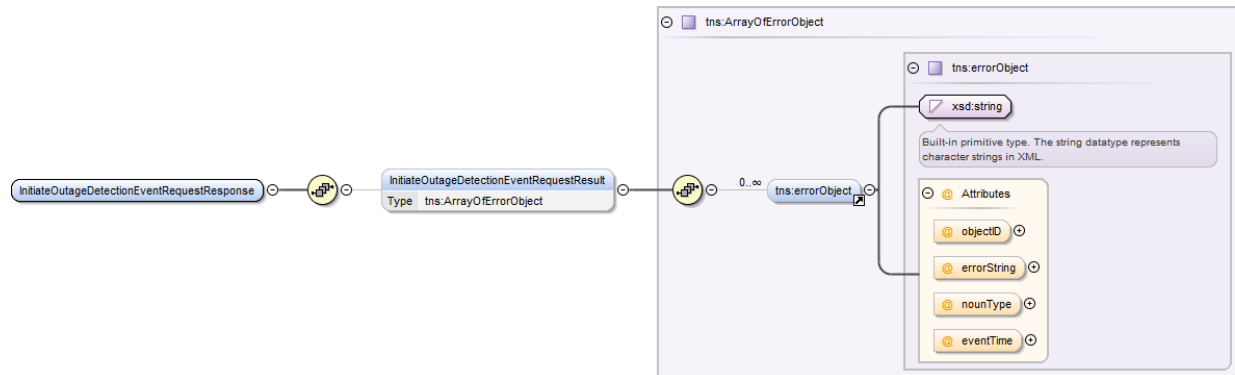


Figure 18 Initiate Outage Detection Event Request Response schema

3.3 Use Cases

This chapter describe the different use cases of the Multispeak integration.

3.3.1 Commissioning

The MeterAddNotification operation is used for commissioning process. The commissioning process can vary depends on meters characteristics. For plug and play meters the commissioning is only a pairing between SGG meter identifier and HES meter identifier.

Below the sequence diagram of the Commissioning, use case:

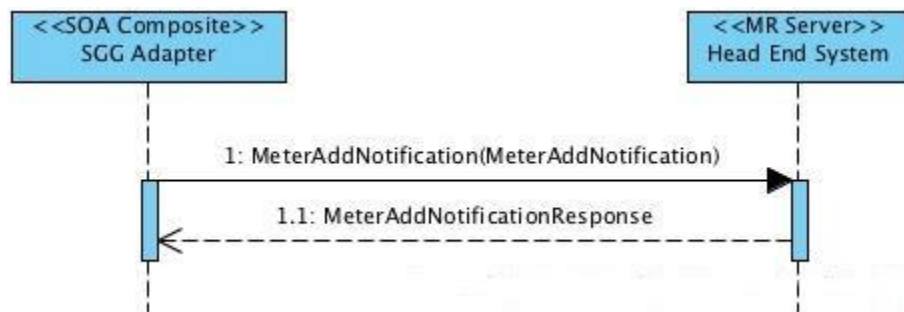


Figure 19 Multispeak Commissioning sequence diagram

- The SGG module invoke the operation **MeterAddNotification** of the **MR_Server** web-service and send the **MeterAddNotificationSoapIn** message.
- The HES perform the commissioning operation configuring the meter in his database.
- The HES reply to the SGG sending the **MeterAddNotificationSoapOut** message.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
MR_Server	MeterAddNotification	MeterAddNotificationSoapIn	MeterAddNotificationSoapOut

Table 8 Multispeak Commissioning Messages

3.3.2 Decommissioning

Below the sequence diagram of the Decommissioning, use case:



Figure 20 Multispeak Decommissioning sequence diagram

- The SGG module invoke the operation **MeterRemoveNotification** of the **MR_Server** web-service and send the **MeterRemoveNotificationSoapIn** message.
- The HES perform the decommissioning operation removing the meter from his database.
- The HES reply to the SGG sending the **MeterRemoveNotificationSoapOut** message.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
MR_Server	MeterRemoveNotification	MeterRemoveNotificationSoapIn	MeterRemoveNotificationSoapOut

Table 9 Multispeak Decommissioning Messages

3.3.3 Connection

Below the sequence diagram of the Connection use case:

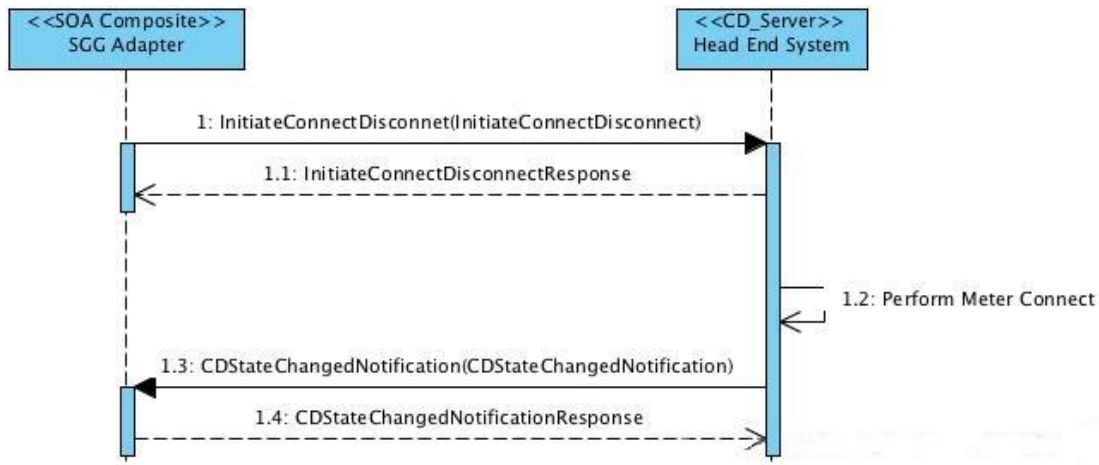


Figure 21 Multispeak Connection sequence diagram

- The SGG module invoke the operation **InitiateConnectDisconnect** of the **CD_Server** web-service and send the **InitiateConnectDisconnectSoapIn** message.
- The HES reply to the SGG sending the **InitiateConnectDisconnectSoapOut** message for ack.
- The HES perform the connection operation connecting the meter.
- The HES invoke the operation **CDStateChangedNotification** of the **CB_Server** web-service and send the **CDStateChangedNotificationSoapIn** message.
- The SGG module reply to the HES sending the **CDStateChangedNotificationSoapOut** message for ack.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
CD_Server	InitiateConnectDisconnect	InitiateConnectDisconnectSoapIn	InitiateConnectDisconnectSoapOut
CB_Server	CDStateChangedNotification	CDStateChangedNotificationSoapIn	CDStateChangedNotificationSoapOut

Table 10 Multispeak Connection Messages

3.3.4 Disconnection

Below the sequence diagram of the Disconnection use case:

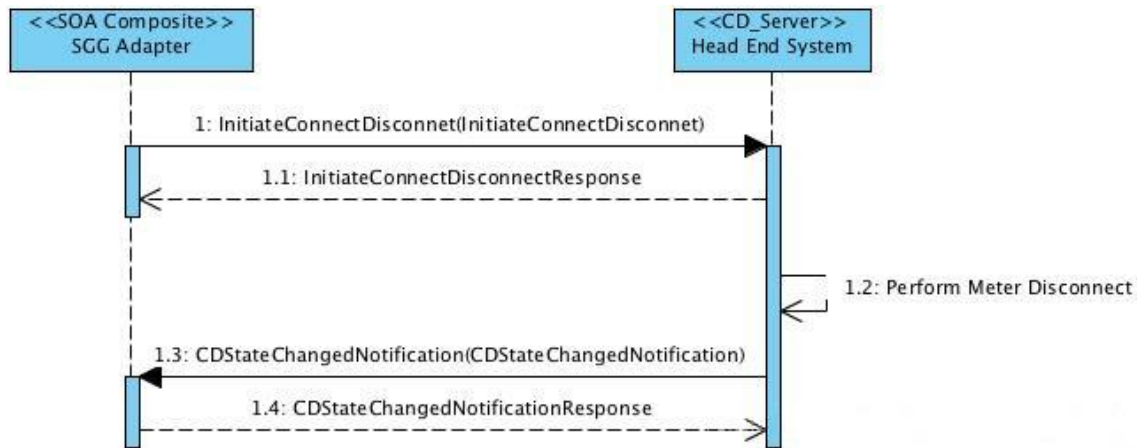


Figure 22 Multispeak Disconnection sequence diagram

- The SGG module invoke the operation **InitiateConnectDisconnect** of the **CD_Server** web-service and send the **InitiateConnectDisconnectSoapIn** message.
- The HES reply to the SGG sending the **InitiateConnectDisconnectSoapOut** message for ack.
- The HES perform the disconnection operation disconnecting the meter.
- The HES invoke the operation **CDStateChangedNotification** of the **CB_Server** web-service and send the **CDStateChangedNotificationSoapIn** message.
- The SGG module reply to the HES sending the **CDStateChangedNotificationSoapOut** message for ack.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
CD_Server	InitiateConnectDisconnect	InitiateConnectDisconnectSoapIn	InitiateConnectDisconnectSoapOut
CB_Server	CDStateChangedNotification	CDStateChangedNotificationSoapIn	CDStateChangedNotificationSoapOut

Table 11 Multispeak Disconnection Messages

3.3.5 Scheduled Meter Reads and Events

Below the sequence diagram of the Scheduled Meter Reads and Events use case:

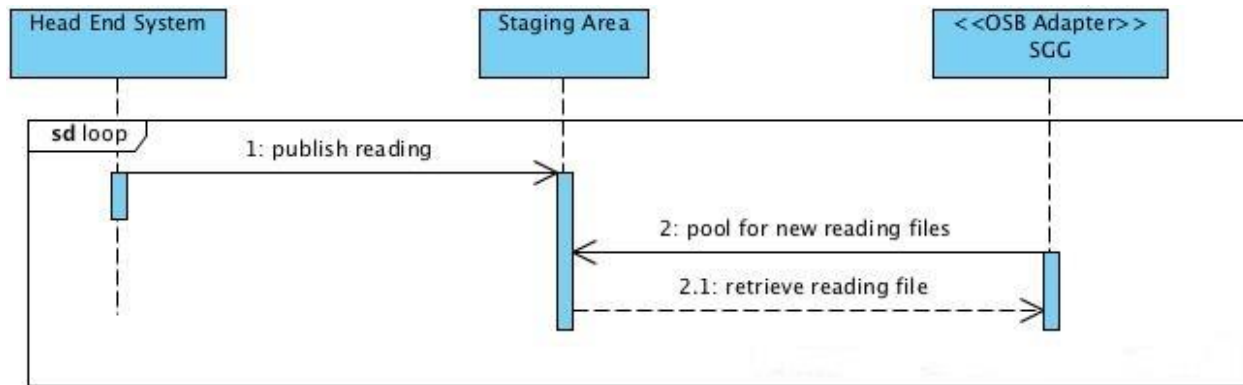


Figure 23 Multispeak Scheduled Meter Reads and Events sequence diagram

- The HES send a CSV file with meter readings and events in a Staging Area following the scheduled time configured.
- The SGG module get the CSV file from the Staging Area and store meter readings and events in his database.

The file will be uploaded through a shared folder accessible by HES through NFS protocol in a dedicated directory on SOA server.

The name of the file will be :

[HES Code]+[timestamp].csv

where HES code is a unique code for each HES.

The CSV file can contains two different record formats. One for the readings and one for the events:

Field Position	Field Name	Type	Definition
1	Record Type ID	Constant character "U"	Record Type Identifier
2	Start Datetime	Datetime in unix time format. Unix time (also known as POSIX time or UNIX Epoch time) is a system for describing a point in time, defined as an approximation of the number of seconds that have elapsed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January	Meter read's set start date time (start date time of the first interval reading in the in the provided interval reading sequence)

Field Position	Field Name	Type	Definition
		1970	
3	End Datetime	Datetime in unix time format	Meter read's set end date time (end date time of the last interval reading in the provided interval reading sequence)
4	Device ID	String	Device Identifier
5	Interval Duration	Numeric integer	SPI: Time between one reading and the next one expressed in seconds
6	UOM	String	Unit of measure of the readings
7	Readings	Array of readings. Every reading is a pair <numeric floating point, string>	Array of readings. Every reading is a pair of reading value and reading status separated by ":" character. Reading status is optional, if omitted also the ":" separator must be omitted. Every entry in the reading array is separated by "," character

Table 12 CSV file format for interval meter readings

Field Position	Field Name	Type	Definition
----------------	------------	------	------------

Field Position	Field Name	Type	Definition
1	Record Type ID	Constant character "E"	Record Type Identifier
2	Event Datetime	Datetime in Unix time format	The datetime at which the event occurred
3	Device ID	String	Device Identifier
4	Event Name	String	Event type identifier

Table 13 CSV file format for device events

The last record of the file is a control row with the below format:

Field Position	Field Name	Type	Definition
1	Record Type ID	Constant character "T"	Record Type Identifier
2	Creation Datetime	Datetime in Unix time format	File creation datetime
3	Total Records	Numeric Integer	Number of records in file

Table 14 CSV file control row format

Below an example file with demo data:

Example file
U,1533888000,1533891600,DEVICE_DG_0,900,KWH,10.72:501000,22.5:501000,3.99:501000,14.4:501000
E,1533892500,DEVICE_DG_1,Power Outage
U,1533891600,1533898800,DEVICE_DG_2,900,KWH,12.77:501000,21.41:501000,13.44:501000,34.62:501000,45.22:501000,26.34:501000,17.82:501000,41.66:501000
E,1533898800,DEVICE_DG_3,Tamper attempt suspected
U,1533898800,1533902400,DEVICE_DG_4,900,KWH,1:S
T,1536580800,5

Table 15 Meter Reads and Events sample file

3.3.6 Alarms

Below the sequence diagram of the Alarms use case:

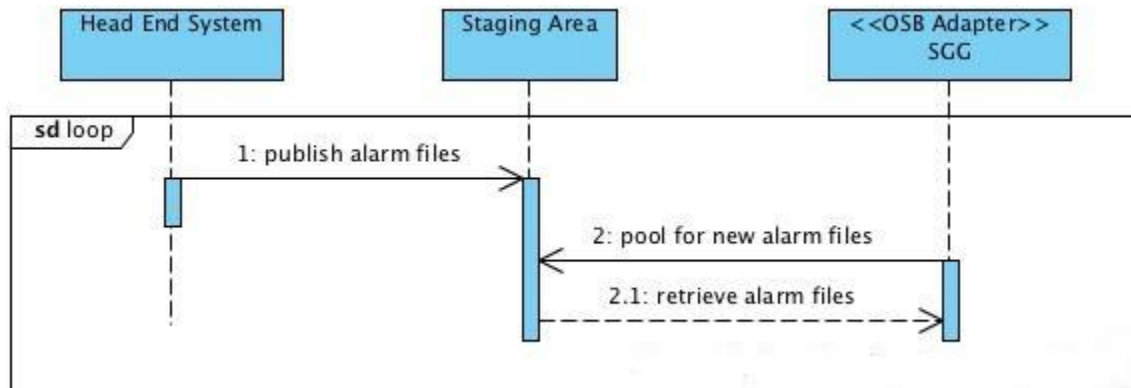


Figure 24 Multispeak Alarms sequence diagram

- The HES send a CSV file with alarms in a Staging Area following the scheduled time configured.
- The SGG module get the CSV file from the Staging Area and store alarms in his database.

The CSV file format is the same of the [§3.3.5 Scheduled Meter Reads and Events](#) use case.

3.3.7 On-Demand Meter Reading

Below the sequence diagram of the On-demand Meter Reading use case:

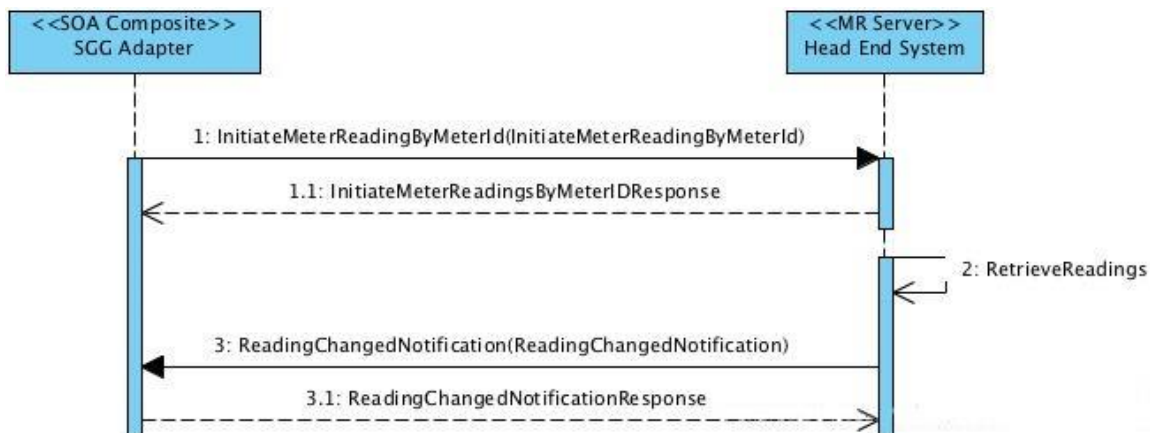


Figure 25 Multispeak On-demand Meter Reading sequence diagram

- The SGG module invoke the operation **InitiateMeterReadingByMeterId** of the **MR_Server** web-service and send the **InitiateMeterReadingByMeterIdSoapIn** message.

- The HES reply to the SGG sending the **InitiateMeterReadingByMeterIdSoapOut** message for ack.
- The HES collect the requested meter read.
- The HES invoke the operation **ReadingChangedNotification** of the **CB_Server** web-service and send the **ReadingChangedNotificationSoapIn** message.
- The SGG module reply to the HES sending the **ReadingChangedNotificationSoapOut** message for ack.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
MR_Server	InitiateMeterReadingByMeterId	InitiateMeterReadingByMeterIdSoapIn	InitiateMeterReadingByMeterIdSoapOut
CB_Server	ReadingChangedNotification	ReadingChangedNotificationSoapIn	ReadingChangedNotificationSoapOut

Table 16 Multispeak On-Demand Meter Reading Messages

3.3.8 Device Status

Below the sequence diagram of the On-demand Device Status use case:

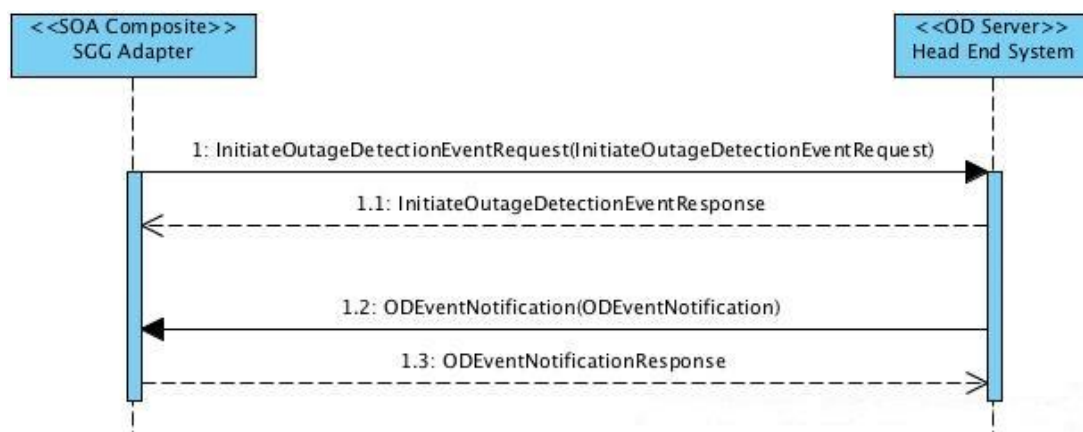


Figure 26 Multispeak Device Status sequence diagram

- The SGG module invoke the operation **InitiateOutageDetectionEventRequest** of the **OD_Server** web-service and send the **InitiateOutageDetectionEventRequestSoapIn** message.
- The HES reply to the SGG sending the **InitiateOutageDetectionEventRequestSoapOut** message for ack.
- The HES collect the status of the meter.
- The HES invoke the operation **OdEventNotification** of the **OA_Server** web-service and send the **OdEventNotificationSoapIn** message.
- The SGG module reply to the HES sending the **OdEventNotificationSoapOut** message for ack.

Below the schema of the messages:

Web-Service	Operation	Request Message	Response Message
OD_Server	InitiateOutageDetectionEventRequest	InitiateOutageDetectionEventRequestSoapIn	InitiateOutageDetectionEventRequestSoapOut
OA_Server	OdEventNotification	OdEventNotificationSoapIn	OdEventNotificationSoapOut

Table 17 Multispeak Device Status Messages

4 Annex A Multispeak Web-Services

This annex contains the source of the WSDL and the XSD related to the Multispeak web-services described in this document.

4.1 MR_Server

4.1.1 WSDL

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions targetNamespace="http://www.multispeak.org/Version_4.1_Release"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:s3="http://www.w3.org/1999/xlink"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:s1="cpsm_V4.1_Release"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s2="gml_V4.1_Release"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.multispeak.org/Version_4.1_Release">
      <s:include schemaLocation="MR_Server.xsd"/>
    </s:schema>
    <s:schema elementFormDefault="qualified" targetNamespace="cpsm_V4.1_Release">
      <s:include schemaLocation="../common/cpsm.xsd"/>
    </s:schema>
    <s:schema elementFormDefault="qualified" targetNamespace="gml_V4.1_Release">
      <s:include schemaLocation="../common/gml.xsd"/>
    </s:schema>
  </wsdl:types>

```

```

    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.w3.org/1999/xlink">
    <s:include schemaLocation="../common/xlink.xsd"/>
    </s:schema>
</wsdl:types>
<wsdl:message name="MeterRemoveNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:MeterRemoveNotification"/>
</wsdl:message>
<wsdl:message name="MeterRemoveNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:MeterRemoveNotificationResponse"/>
</wsdl:message>
<wsdl:message name="MeterRemoveNotificationMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
</wsdl:message>
<wsdl:message name="MeterAddNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:MeterAddNotification"/>
</wsdl:message>
<wsdl:message name="MeterAddNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:MeterAddNotificationResponse"/>
</wsdl:message>
<wsdl:message name="MeterAddNotificationMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
</wsdl:message>
<wsdl:message name="InitiateMeterReadingsByMeterIDSoapIn">
    <wsdl:part name="parameters" element="tns:InitiateMeterReadingsByMeterID"/>
</wsdl:message>
<wsdl:message name="InitiateMeterReadingsByMeterIDSoapOut">
    <wsdl:part name="parameters" element="tns:InitiateMeterReadingsByMeterIDResponse"/>
</wsdl:message>
<wsdl:message name="InitiateMeterReadingsByMeterIDMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
</wsdl:message>
<wsdl:portType name="MR_ServerSoap">
    <wsdl:operation name="MeterRemoveNotification">
        <wsdl:documentation>Publisher
                                notifies MR
                                to remove

```

the
 associated
 meter(s).
 MR returns
 information
 about
 failed
 transactions
 using an
 array of
 errorObjects.
 The message
 header
 attribute
 'registrationID'
 should be
 added to
 all publish
 messages to
 indicate to
 the
 subscriber
 under which
 registrationID
 they
 received
 this
 notification
 data.</wsdl:documentation>

```
<wsdl:input message="tns:MeterRemoveNotificationSoapIn"/>
<wsdl:output message="tns:MeterRemoveNotificationSoapOut"/>
</wsdl:operation>
<wsdl:operation name="MeterAddNotification">
  <wsdl:documentation>Publisher
```

notifies MR
 to Add the

associated
meter(s).MR
returns
information
about
failed
transactions
using an
array of
errorObjects.
The message
header
attribute
'registrationID'
should be
added to
all publish
messages to
indicate to
the
subscriber
under which
registrationID
they
received
this
notification
data.</wsdl:documentation>

```
<wsdl:input message="tns:MeterAddNotificationSoapIn"/>
<wsdl:output message="tns:MeterAddNotificationSoapOut"/>
</wsdl:operation>
<wsdl:operation name="InitiateMeterReadingsByMeterID">
  <wsdl:documentation>CB requests
    a new meter
    reading
    from MR, on
    meters
```

selected by
meterID. MR
returns
information
about
failed
transactions
using an
array of
errorObjects.
The meter
reading is
returned to
the CB in
the form of
a
meterReading,
anintervalData
block, or a
formattedBlock,
sent to the
URL
specified
in the
responseURL.
The
transactionID
calling
parameter
links this
Initiate
request
with the
published
data method
call.The

expiration
time
parameter
indicates
the amount
of time for
which the
publisher
should try
to obtain
and publish
the data;
if the
publisher
has been
unsuccessful
in
publishing
the data
after the
expiration
time, then
the
publisher
will
discard the
request and
the
requestor
should not
expect a
response.

```
</wsdl:documentation>
<wsdl:input message="tns:InitiateMeterReadingsByMeterIDSoapIn"/>
<wsdl:output message="tns:InitiateMeterReadingsByMeterIDSoapOut"/>
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="MR_ServerSoap" type="tns:MR_ServerSoap">
```

```

<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
<wsp:PolicyReference URI="#wss_username_token_service_policy" wsdl:required="false"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"/>
<wsdl:operation name="MeterRemoveNotification">
  <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/MeterRemoveNotification"/>
  <wsdl:input>
    <soap:body use="literal"/>
    <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
    <soap:header message="tns:MeterRemoveNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="MeterAddNotification">
  <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/MeterAddNotification"/>
  <wsdl:input>
    <soap:body use="literal"/>
    <soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
    <soap:header message="tns:MeterAddNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="InitiateMeterReadingsByMeterID">
  <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateMeterReadingsByMeterID
"/>
  <wsdl:input>

```



```

    <soap:body use="literal"/>
    <soap:header message="tns:InitiateMeterReadingsByMeterIDMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
    <soap:header message="tns:InitiateMeterReadingsByMeterIDMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
  </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="MR_Server">
  <wsdl:port name="MR_ServerSoap_pt" binding="tns:MR_ServerSoap">
    <soap:address location="http://192.168.0.233:7004/soa-
infra/services/DG_Test/DGTestHarness/MR_Server"/>
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

4.1.2 XSD

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:gml="gml_V4.1_Release"
xmlns:cpsm="cpsm_V4.1_Release">
  <xsd:include schemaLocation="../common/mspcommon.xsd"/>
  <xsd:element name="MeterAddNotification">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="addedMeters" type="tns:meters" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

```

```

<xsd:complexType name="meters" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="electricMeters" type="tns:ArrayOfElectricMeter" minOccurs="0"/>
        <xsd:element name="waterMeters" type="tns:ArrayOfWaterMeter" minOccurs="0"/>
        <xsd:element name="gasMeters" type="tns:ArrayOfGasMeter" minOccurs="0"/>
        <xsd:element name="propaneMeters" type="tns:ArrayOfPropaneMeter" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="mspMeter" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="meterNo" type="xsd:string" minOccurs="0"/>
        <xsd:element name="installedDate" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="removedDate" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="manufacturer" type="xsd:string" minOccurs="0"/>
        <xsd:element name="catalogNumber" type="xsd:string" minOccurs="0"/>
        <xsd:element name="serialNumber" type="xsd:string" minOccurs="0"/>
        <xsd:element name="metrologyFirmwareVersion" type="xsd:string" minOccurs="0"/>
        <xsd:element name="metrologyFirmwareRevision" type="xsd:string" minOccurs="0"/>
        <xsd:element name="meterType" type="xsd:string" minOccurs="0"/>
        <xsd:element name="AMRDeviceType" type="xsd:string" minOccurs="0"/>
        <xsd:element name="AMRVendor" type="xsd:string" minOccurs="0"/>
        <xsd:element name="billingCycle" type="xsd:string" minOccurs="0"/>
        <xsd:element name="meterStatusList" type="tns:ArrayOfMeterStatuses"
minOccurs="0"/>
        <xsd:element name="moduleList" type="tns:ArrayOfModule" minOccurs="0"/>
        <xsd:element name="utilityInfo" type="tns:utilityInfo" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

```

```

<xsd:complexType name="ArrayOfModule">
  <xsd:sequence>
    <xsd:element name="module" type="tns:module" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="module" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mSPDevice">
      <xsd:sequence>
        <xsd:element name="description" type="xsd:string" minOccurs="0"/>
        <xsd:element name="moduleType" type="xsd:string" minOccurs="0"/>
        <xsd:element name="firmwareVersion" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="mSPDevice" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mSPObject">
      <xsd:sequence>
        <xsd:element name="deviceClass" type="xsd:string" minOccurs="0"/>
        <xsd:element name="inServiceDate" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="outServiceDate" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="facilityID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="manufacturer" type="xsd:string" minOccurs="0"/>
        <xsd:element name="serialNumber" type="xsd:string" minOccurs="0"/>
        <xsd:element name="assetFields" type="tns:assetFields" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="assetFields">
  <xsd:sequence>
    <xsd:element name="manufacturer" type="xsd:string" minOccurs="0"/>
    <xsd:element name="serialNumber" type="xsd:string" minOccurs="0"/>
    <xsd:element name="manufacturedDate" type="xsd:dateTime" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

```

```

    <xsd:element name="price" type="tns:money" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="money">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="currencyCode" type="tns:currencyCode"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="currencyCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="USD"/>
    <xsd:enumeration value="EUR"/>
    <xsd:enumeration value="ADF"/>
    <xsd:enumeration value="ADP"/>
    <xsd:enumeration value="AED"/>
    <xsd:enumeration value="AFN"/>
    <xsd:enumeration value="ALL"/>
    <xsd:enumeration value="AMD"/>
    <xsd:enumeration value="ANG"/>
    <xsd:enumeration value="AOA"/>
    <xsd:enumeration value="ARS"/>
    <xsd:enumeration value="ATS"/>
    <xsd:enumeration value="AUD"/>
    <xsd:enumeration value="AWG"/>
    <xsd:enumeration value="AZN"/>
    <xsd:enumeration value="BAM"/>
    <xsd:enumeration value="BBD"/>
    <xsd:enumeration value="BDT"/>
    <xsd:enumeration value="BEF"/>
    <xsd:enumeration value="BGN"/>
    <xsd:enumeration value="BHD"/>
    <xsd:enumeration value="BIF"/>
    <xsd:enumeration value="BMD"/>
    <xsd:enumeration value="BND"/>
  </xsd:restriction>
</xsd:simpleType>

```

```
<xsd:enumeration value="BOB"/>
<xsd:enumeration value="BOV"/>
<xsd:enumeration value="BRL"/>
<xsd:enumeration value="BSD"/>
<xsd:enumeration value="BTN"/>
<xsd:enumeration value="BWP"/>
<xsd:enumeration value="BYR"/>
<xsd:enumeration value="BZD"/>
<xsd:enumeration value="CAD"/>
<xsd:enumeration value="CDF"/>
<xsd:enumeration value="CHE"/>
<xsd:enumeration value="CHF"/>
<xsd:enumeration value="CHW"/>
<xsd:enumeration value="CLF"/>
<xsd:enumeration value="CLP"/>
<xsd:enumeration value="CNY"/>
<xsd:enumeration value="COP"/>
<xsd:enumeration value="COU"/>
<xsd:enumeration value="CRC"/>
<xsd:enumeration value="CUP"/>
<xsd:enumeration value="CVE"/>
<xsd:enumeration value="CYP"/>
<xsd:enumeration value="CZK"/>
<xsd:enumeration value="DEM"/>
<xsd:enumeration value="DJF"/>
<xsd:enumeration value="DKK"/>
<xsd:enumeration value="DOP"/>
<xsd:enumeration value="DZD"/>
<xsd:enumeration value="EEK"/>
<xsd:enumeration value="EGP"/>
<xsd:enumeration value="ERN"/>
<xsd:enumeration value="ESP"/>
<xsd:enumeration value="ETB"/>
<xsd:enumeration value="FIM"/>
<xsd:enumeration value="FJD"/>
<xsd:enumeration value="FKP"/>
<xsd:enumeration value="FRF"/>
```

```
<xsd:enumeration value="GBP"/>
<xsd:enumeration value="GEL"/>
<xsd:enumeration value="GHS"/>
<xsd:enumeration value="GIP"/>
<xsd:enumeration value="GMD"/>
<xsd:enumeration value="GNF"/>
<xsd:enumeration value="GRD"/>
<xsd:enumeration value="GTQ"/>
<xsd:enumeration value="GYD"/>
<xsd:enumeration value="HKD"/>
<xsd:enumeration value="HNL"/>
<xsd:enumeration value="HRK"/>
<xsd:enumeration value="HTG"/>
<xsd:enumeration value="HUF"/>
<xsd:enumeration value="IDR"/>
<xsd:enumeration value="IEP"/>
<xsd:enumeration value="ILS"/>
<xsd:enumeration value="INR"/>
<xsd:enumeration value="IQD"/>
<xsd:enumeration value="IRR"/>
<xsd:enumeration value="ISK"/>
<xsd:enumeration value="ITL"/>
<xsd:enumeration value="JMD"/>
<xsd:enumeration value="JOD"/>
<xsd:enumeration value="JPY"/>
<xsd:enumeration value="KES"/>
<xsd:enumeration value="KGS"/>
<xsd:enumeration value="KHR"/>
<xsd:enumeration value="KMF"/>
<xsd:enumeration value="KPW"/>
<xsd:enumeration value="KRW"/>
<xsd:enumeration value="KWD"/>
<xsd:enumeration value="KYD"/>
<xsd:enumeration value="KZT"/>
<xsd:enumeration value="LAK"/>
<xsd:enumeration value="LBP"/>
```

```
<xsd:enumeration value="LKR"/>
<xsd:enumeration value="LRD"/>
<xsd:enumeration value="LSL"/>
<xsd:enumeration value="LTL"/>
<xsd:enumeration value="LUF"/>
<xsd:enumeration value="LVL"/>
<xsd:enumeration value="LYD"/>
<xsd:enumeration value="MAD"/>
<xsd:enumeration value="MCF"/>
<xsd:enumeration value="MDL"/>
<xsd:enumeration value="MGA"/>
<xsd:enumeration value="MKD"/>
<xsd:enumeration value="MMK"/>
<xsd:enumeration value="MNT"/>
<xsd:enumeration value="MOP"/>
<xsd:enumeration value="MRO"/>
<xsd:enumeration value="MTL"/>
<xsd:enumeration value="MUR"/>
<xsd:enumeration value="MVR"/>
<xsd:enumeration value="MWK"/>
<xsd:enumeration value="MXN"/>
<xsd:enumeration value="MXV"/>
<xsd:enumeration value="MYR"/>
<xsd:enumeration value="MZN"/>
<xsd:enumeration value="NAD"/>
<xsd:enumeration value="NGN"/>
<xsd:enumeration value="NIO"/>
<xsd:enumeration value="NLG"/>
<xsd:enumeration value="NOK"/>
<xsd:enumeration value="NPR"/>
<xsd:enumeration value="NZD"/>
<xsd:enumeration value="OMR"/>
<xsd:enumeration value="PAB"/>
<xsd:enumeration value="PEN"/>
<xsd:enumeration value="PGK"/>
<xsd:enumeration value="PHP"/>
<xsd:enumeration value="PKR"/>
```

```
<xsd:enumeration value="PLN"/>
<xsd:enumeration value="PTE"/>
<xsd:enumeration value="PYG"/>
<xsd:enumeration value="QAR"/>
<xsd:enumeration value="RON"/>
<xsd:enumeration value="RSD"/>
<xsd:enumeration value="RUB"/>
<xsd:enumeration value="RWF"/>
<xsd:enumeration value="SAR"/>
<xsd:enumeration value="SBD"/>
<xsd:enumeration value="SCR"/>
<xsd:enumeration value="SDG"/>
<xsd:enumeration value="SEK"/>
<xsd:enumeration value="SGD"/>
<xsd:enumeration value="SHP"/>
<xsd:enumeration value="SIT"/>
<xsd:enumeration value="SKK"/>
<xsd:enumeration value="SLL"/>
<xsd:enumeration value="SML"/>
<xsd:enumeration value="SOS"/>
<xsd:enumeration value="SRD"/>
<xsd:enumeration value="STD"/>
<xsd:enumeration value="SYP"/>
<xsd:enumeration value="SZL"/>
<xsd:enumeration value="THB"/>
<xsd:enumeration value="TJS"/>
<xsd:enumeration value="TMM"/>
<xsd:enumeration value="TND"/>
<xsd:enumeration value="TOP"/>
<xsd:enumeration value="TRY"/>
<xsd:enumeration value="TTD"/>
<xsd:enumeration value="TWD"/>
<xsd:enumeration value="TZS"/>
<xsd:enumeration value="UAH"/>
<xsd:enumeration value="UGX"/>
<xsd:enumeration value="USN"/>
```



```
<xsd:enumeration value="USS"/>
<xsd:enumeration value="UYU"/>
<xsd:enumeration value="UZS"/>
<xsd:enumeration value="VAL"/>
<xsd:enumeration value="VEF"/>
<xsd:enumeration value="VND"/>
<xsd:enumeration value="VUV"/>
<xsd:enumeration value="WST"/>
<xsd:enumeration value="XAF"/>
<xsd:enumeration value="XAG"/>
<xsd:enumeration value="XAU"/>
<xsd:enumeration value="XBA"/>
<xsd:enumeration value="XBB"/>
<xsd:enumeration value="XBC"/>
<xsd:enumeration value="XBD"/>
<xsd:enumeration value="XCD"/>
<xsd:enumeration value="XDR"/>
<xsd:enumeration value="XEU"/>
<xsd:enumeration value="XFU"/>
<xsd:enumeration value="XOF"/>
<xsd:enumeration value="XPD"/>
<xsd:enumeration value="XPF"/>
<xsd:enumeration value="XPT"/>
<xsd:enumeration value="XTS"/>
<xsd:enumeration value="XXX"/>
<xsd:enumeration value="YER"/>
<xsd:enumeration value="ZAR"/>
<xsd:enumeration value="ZMK"/>
<xsd:enumeration value="ZWD"/>
<xsd:enumeration value="Other"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="utilityInfo">
  <xsd:sequence>
    <xsd:element name="owner" type="xsd:string" minOccurs="0"/>
    <xsd:element name="district" type="xsd:string" minOccurs="0"/>
    <xsd:element name="serviceLocationID" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
```

```

    <xsd:element name="serviceID" type="tns:serviceID" minOccurs="0"/>
    <xsd:element name="accountNumber" type="xsd:string" minOccurs="0"/>
    <xsd:element name="customerID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="GMLLocation" type="tns:GMLLocation" minOccurs="0"/>
    <xsd:element name="gpsPoint" type="tns:gpsPoint" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="serviceID">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="serviceType" type="tns:serviceType"/>
      <xsd:attribute name="objectID" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="GMLLocation" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:PointType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="gpsPoint">
  <xsd:sequence>
    <xsd:element name="latitude" type="xsd:double"/>
    <xsd:element name="longitude" type="xsd:double"/>
    <xsd:element name="altitude" type="xsd:double" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfElectricMeter">
  <xsd:sequence>
    <xsd:element name="electricMeter" type="tns:electricMeter" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="electricMeter" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspMeter">

```

```

<xsd:sequence>
  <xsd:element name="meterBaseID" type="xsd:string" minOccurs="0"/>
  <xsd:element name="electricNameplate" type="tns:electricNameplate" minOccurs="0"/>
  <xsd:element name="electricLocationFields" type="tns:electricLocationFields"
minOccurs="0"/>
  <xsd:element name="sealNumberList" type="tns:ArrayOfSealNumbers"
minOccurs="0"/>
  <xsd:element name="parentMeterList" type="tns:ArrayOfMeterID" minOccurs="0"/>
  <xsd:element name="subMeterList" type="tns:ArrayOfMeterID" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="electricNameplate">
  <xsd:sequence>
    <xsd:element name="kh" type="xsd:float" minOccurs="0"/>
    <xsd:element name="kr" type="xsd:float" minOccurs="0"/>
    <xsd:element name="frequency" type="tns:frequency" minOccurs="0"/>
    <xsd:element name="numberOfElements" type="xsd:string" minOccurs="0"/>
    <xsd:element name="baseType" type="tns:baseType" minOccurs="0"/>
    <xsd:element name="accuracyClass" type="xsd:string" minOccurs="0"/>
    <xsd:element name="elementsVoltage" type="xsd:string" minOccurs="0"/>
    <xsd:element name="supplyVoltage" type="xsd:string" minOccurs="0"/>
    <xsd:element name="maxAmperage" type="xsd:float" minOccurs="0"/>
    <xsd:element name="testAmperage" type="xsd:float" minOccurs="0"/>
    <xsd:element name="regRatio" type="xsd:float" minOccurs="0"/>
    <xsd:element name="phases" type="xsd:long" minOccurs="0"/>
    <xsd:element name="wires" type="xsd:long" minOccurs="0"/>
    <xsd:element name="dials" type="xsd:long" minOccurs="0"/>
    <xsd:element name="form" type="xsd:string" minOccurs="0"/>
    <xsd:element name="multiplier" type="xsd:float" minOccurs="0"/>
    <xsd:element name="demandMult" type="xsd:float" minOccurs="0"/>
    <xsd:element name="supportedReadingTypes" type="tns:ArrayOfReadingTypes"
minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="frequency">

```

```

<xsd:simpleContent>
  <xsd:extension base="xsd:float">
    <xsd:attribute name="units" type="tns:frequencyUnits"/>
  </xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="frequencyUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Hz"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Cycles per second"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="baseType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Base Type 1"/>
    <xsd:enumeration value="S-base"/>
    <xsd:enumeration value="A-Base"/>
    <xsd:enumeration value="B-Base"/>
    <xsd:enumeration value="K-Base"/>
    <xsd:enumeration value="P-Base"/>
    <xsd:enumeration value="IECBottomConnected"/>
    <xsd:enumeration value="switchboard"/>
    <xsd:enumeration value="rackmount"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="electricLocationFields">
  <xsd:sequence>
    <xsd:element name="substationCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="substationName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="feederCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="bus" type="xsd:string" minOccurs="0"/>
    <xsd:element name="phaseCode" type="tns:phaseCode" minOccurs="0"/>
    <xsd:element name="eaLoc" type="tns:eaLoc" minOccurs="0"/>
    <xsd:element name="transformerBankID" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

```

```

    <xsd:element name="linemenServiceArea" type="xsd:string" minOccurs="0"/>
    <xsd:element name="poleNo" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="phaseCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="A"/>
    <xsd:enumeration value="B"/>
    <xsd:enumeration value="C"/>
    <xsd:enumeration value="N"/>
    <xsd:enumeration value="AB"/>
    <xsd:enumeration value="AC"/>
    <xsd:enumeration value="BC"/>
    <xsd:enumeration value="ABC"/>
    <xsd:enumeration value="AN"/>
    <xsd:enumeration value="BN"/>
    <xsd:enumeration value="CN"/>
    <xsd:enumeration value="ABN"/>
    <xsd:enumeration value="ACN"/>
    <xsd:enumeration value="BCN"/>
    <xsd:enumeration value="ABCN"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="eaLoc">
  <xsd:simpleContent>
    <xsd:extension base="tns:objectRef"/>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="ArrayOfWaterMeter">
  <xsd:sequence>
    <xsd:element name="waterMeter" type="tns:waterMeter" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="waterMeter" mixed="false">
  <xsd:complexContent mixed="false">

```

```

<xsd:extension base="tns:mspMeter">
  <xsd:sequence>
    <xsd:element name="waterNameplate" type="tns:waterNameplate" minOccurs="0"/>
    <xsd:element name="waterLocationFields" type="tns:waterLocationFields"
minOccurs="0"/>
  </xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="waterNameplate">
  <xsd:sequence>
    <xsd:element name="installType" type="tns:installType" minOccurs="0"/>
    <xsd:element name="fluidType" type="tns:fluidType" minOccurs="0"/>
    <xsd:element name="driveType" type="tns:driveType" minOccurs="0"/>
    <xsd:element name="pipeSize" type="tns:pipeSize" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="installType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="fluidType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
    <xsd:enumeration value="4"/>
    <xsd:enumeration value="5"/>
    <xsd:enumeration value="6"/>
  </xsd:restriction>
</xsd:simpleType>

```

```
<xsd:simpleType name="driveType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
    <xsd:enumeration value="4"/>
    <xsd:enumeration value="5"/>
    <xsd:enumeration value="6"/>
    <xsd:enumeration value="7"/>
    <xsd:enumeration value="8"/>
    <xsd:enumeration value="9"/>
    <xsd:enumeration value="10"/>
    <xsd:enumeration value="11"/>
    <xsd:enumeration value="12"/>
    <xsd:enumeration value="13"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="pipeSize">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
    <xsd:enumeration value="4"/>
    <xsd:enumeration value="5"/>
    <xsd:enumeration value="6"/>
    <xsd:enumeration value="7"/>
    <xsd:enumeration value="8"/>
    <xsd:enumeration value="9"/>
    <xsd:enumeration value="10"/>
    <xsd:enumeration value="11"/>
    <xsd:enumeration value="12"/>
    <xsd:enumeration value="13"/>
    <xsd:enumeration value="14"/>
    <xsd:enumeration value="15"/>
    <xsd:enumeration value="16"/>
  </xsd:restriction>
</xsd:simpleType>
```

```

    <xsd:enumeration value="17"/>
    <xsd:enumeration value="18"/>
    <xsd:enumeration value="19"/>
    <xsd:enumeration value="20"/>
    <xsd:enumeration value="21"/>
    <xsd:enumeration value="22"/>
    <xsd:enumeration value="23"/>
    <xsd:enumeration value="24"/>
    <xsd:enumeration value="25"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="waterLocationFields">
  <xsd:sequence>
    <xsd:element name="serviceLocationID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="waterServiceID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfGasMeter">
  <xsd:sequence>
    <xsd:element name="gasMeter" type="tns:gasMeter" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="gasMeter" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mSPMeter">
      <xsd:sequence>
        <xsd:element name="gasNameplate" type="tns:gasNameplate" minOccurs="0"/>
        <xsd:element name="gasLocationFields" type="tns:gasLocationFields" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="gasNameplate">
  <xsd:sequence>

```



```

<xsd:element name="mechanicalForm" type="tns:mechanicalForm" minOccurs="0"/>
<xsd:element name="measurementSystem" type="tns:measurementSystem"
minOccurs="0"/>
<xsd:element name="gasPressure" type="tns:gasPressure" minOccurs="0"/>
<xsd:element name="gasFlow" type="tns:gasFlow" minOccurs="0"/>
<xsd:element name="gearDriveSize" type="tns:gearDriveSize" minOccurs="0"/>
<xsd:element name="internalPipeDiameter" type="tns:internalPipeDiameter"
minOccurs="0"/>
<xsd:element name="temperatureCompensationType"
type="tns:temperatureCompensationType" minOccurs="0"/>
<xsd:element name="pressureCompensationType" type="tns:pressureCompensationType"
minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="mechanicalForm">
<xsd:restriction base="xsd:string">
<xsd:enumeration value="0"/>
<xsd:enumeration value="1"/>
<xsd:enumeration value="2"/>
<xsd:enumeration value="3"/>
<xsd:enumeration value="4"/>
<xsd:enumeration value="5"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="measurementSystem">
<xsd:restriction base="xsd:string">
<xsd:enumeration value="0"/>
<xsd:enumeration value="1"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="gasPressure">
<xsd:simpleContent>
<xsd:extension base="xsd:float">
<xsd:attribute name="maxPressureUOM" type="tns:pressureUnits"/>
</xsd:extension>
</xsd:simpleContent>
</xsd:complexType>

```

```

<xsd:simpleType name="pressureUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Pascal"/>
    <xsd:enumeration value="Newton per square meter"/>
    <xsd:enumeration value="PSI"/>
    <xsd:enumeration value="Bar"/>
    <xsd:enumeration value="Barye"/>
    <xsd:enumeration value="Atmosphere"/>
    <xsd:enumeration value="Millibar"/>
    <xsd:enumeration value="Inch of Hg"/>
    <xsd:enumeration value="Millimeter of Hg"/>
    <xsd:enumeration value="Inch of water"/>
    <xsd:enumeration value="Millimeter of water"/>
    <xsd:enumeration value="Kip"/>
    <xsd:enumeration value="Pound-force"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="gasFlow">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="maxFlowRateUOM" type="tns:uom"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="gearDriveSize">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
    <xsd:enumeration value="4"/>
    <xsd:enumeration value="5"/>
    <xsd:enumeration value="6"/>
    <xsd:enumeration value="7"/>
  </xsd:restriction>

```

```

</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="internalPipeDiameter">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
    <xsd:enumeration value="3"/>
    <xsd:enumeration value="4"/>
    <xsd:enumeration value="5"/>
    <xsd:enumeration value="6"/>
    <xsd:enumeration value="7"/>
    <xsd:enumeration value="8"/>
    <xsd:enumeration value="9"/>
    <xsd:enumeration value="10"/>
    <xsd:enumeration value="11"/>
    <xsd:enumeration value="12"/>
    <xsd:enumeration value="13"/>
    <xsd:enumeration value="14"/>
    <xsd:enumeration value="15"/>
    <xsd:enumeration value="16"/>
    <xsd:enumeration value="17"/>
    <xsd:enumeration value="18"/>
    <xsd:enumeration value="19"/>
    <xsd:enumeration value="20"/>
    <xsd:enumeration value="21"/>
    <xsd:enumeration value="22"/>
    <xsd:enumeration value="23"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="temperatureCompensationType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

<xsd:simpleType name="pressureCompensationType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
    <xsd:enumeration value="2"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="gasLocationFields">
  <xsd:sequence>
    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfPropaneMeter">
  <xsd:sequence>
    <xsd:element name="propaneMeter" type="tns:propaneMeter" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="propaneMeter" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mSPMeter">
      <xsd:sequence>
        <xsd:element name="propaneNameplate" type="tns:propaneNameplate" minOccurs="0"/>
        <xsd:element name="propaneLocationFields" type="tns:propaneLocationFields"
minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="propaneNameplate" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:gasNameplate"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="propaneLocationFields">
  <xsd:sequence>

```

```

    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="MeterAddNotificationResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="MeterAddNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="MeterRemoveNotification">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="removedMeters" type="tns:meters" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="MeterRemoveNotificationResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="MeterRemoveNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="InitiateMeterReadingsByMeterID">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="meterIDs" type="tns:ArrayOfMeterIDNillable" minOccurs="0"/>
      <xsd:element name="responseURL" type="xsd:string" minOccurs="0"/>
      <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
      <xsd:element name="expTime" type="tns:expirationTime" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:complexType name="expirationTime">

```

```

<xsd:simpleContent>
  <xsd:extension base="tns:time"/>
</xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="time">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="tns:timeUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="timeUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Milliseconds"/>
    <xsd:enumeration value="Seconds"/>
    <xsd:enumeration value="Minutes"/>
    <xsd:enumeration value="Hours"/>
    <xsd:enumeration value="Days"/>
    <xsd:enumeration value="Weeks"/>
    <xsd:enumeration value="Months"/>
    <xsd:enumeration value="Years"/>
    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:element name="InitiateMeterReadingsByMeterIDResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="InitiateMeterReadingsByMeterIDResult"
type="tns:ArrayOfErrorObject" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xsd:schema>

```

4.2 CB_Server

4.2.1 WSDL

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions targetNamespace="http://www.multispeak.org/Version_4.1_Release"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:s3="http://www.w3.org/1999/xlink"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:s1="cpsm_V4.1_Release"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s2="gml_V4.1_Release"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.multispeak.org/Version_4.1_Release">
      <s:include schemaLocation="CB_Server.xsd"/>
    </s:schema>
    <s:schema elementFormDefault="qualified" targetNamespace="cpsm_V4.1_Release">
      <s:include schemaLocation="../common/cpsm.xsd"/>
    </s:schema>
  </wsdl:types>
  <wsdl:message name="ReadingChangedNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:ReadingChangedNotification"/>
  </wsdl:message>
  <wsdl:message name="ReadingChangedNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:ReadingChangedNotificationResponse"/>
  </wsdl:message>
  <wsdl:message name="ReadingChangedNotificationMultiSpeakMsgHeader">
```

```

    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
  </wsdl:message>
  <wsdl:message name="CDStateChangedNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:CDStateChangedNotification"/>
  </wsdl:message>
  <wsdl:message name="CDStateChangedNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:CDStateChangedNotificationResponse"/>
  </wsdl:message>
  <wsdl:message name="CDStateChangedNotificationMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
  </wsdl:message>
  <wsdl:message name="CDStatesChangedNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:CDStatesChangedNotification"/>
  </wsdl:message>
  <wsdl:message name="CDStatesChangedNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:CDStatesChangedNotificationResponse"/>
  </wsdl:message>
  <wsdl:message name="CDStatesChangedNotificationMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
  </wsdl:message>
  <wsdl:portType name="CB_ServerSoap">
    <wsdl:operation name="ReadingChangedNotification">
      <wsdl:documentation>MR
        Notifies
        CB of a
        change
        in meter
        readings
        by
        sending
        the
        changed
        meterReading
        objects.
        CB
        returns

```


information
about
failed
transactions
in an
array of
errorObjects.The
transactionID
calling
parameter
links
this
Initiate
request
with the
published
data
method
call.
The
message
header
attribute
'registrationID'
should
be added
to all
publish
messages
to
indicate
to the
subscriber
under
which
registrationID
they

```

received
this
notification
data.</wsdl:documentation>
<wsdl:input message="tns:ReadingChangedNotificationSoapIn"/>
<wsdl:output message="tns:ReadingChangedNotificationSoapOut"/>
</wsdl:operation>
<wsdl:operation name="CDStateChangedNotification">
  <wsdl:documentation>CD
    notifies
    CB of
    state
    change
    for a
    connect/disconnect
    device
    By
    meterID
    and
    loadActionCode.
    The
    transactionID
    calling
    parameter
    can be
    used to
    link
    this
    action
    with an
    InitiateConectDisconnect
    call. If
    this
    transaction
    fails,
    CB

```

returns
information
about
the
failure
in a
SOAPFault.
The
message
header
attribute
'registrationID'
should
be added
to all
publish
messages
to
indicate
to the
subscriber
under
which
registrationID
they
received
this
notification
data.</wsdl:documentation>

```
<wsdl:input message="tns:CDDStateChangedNotificationSoapIn"/>
<wsdl:output message="tns:CDDStateChangedNotificationSoapOut"/>
</wsdl:operation>
<wsdl:operation name="CDDStatesChangedNotification">
  <wsdl:documentation>CDD
```

notifies
CB of
state

change(s)
for
connect/disconnect
device(s).
The
transactionID
calling
parameter
can be
used to
link
this
action
with an
InitiateConectDisconnect
call. If
this
transaction
fails,
CB
returns
information
about
the
failure
in an
array of
errorObject(s).
The
message
header
attribute
'registrationID'
should
be added
to all

publish
 messages
 to
 indicate
 to the
 subscriber
 under
 which
 registrationID
 they
 received
 this
 notification
 data.</wsdl:documentation>

```
<wsdl:input message="tns:CDStatesChangedNotificationSoapIn"/>
<wsdl:output message="tns:CDStatesChangedNotificationSoapOut"/>
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="CB_ServerSoap" type="tns:CB_ServerSoap">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="ReadingChangedNotification">
    <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/ReadingChangedNotification"/>
    <wsdl:input>
      <soap:body use="literal"/>
      <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
      <soap:header message="tns:ReadingChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="CDStateChangedNotification">
    <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/CDStateChangedNotification"/>
```

```

    <wsdl:input>
      <soap:body use="literal"/>
      <soap:header message="tns:CDStateChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
      <soap:header message="tns:CDStateChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="CDStatesChangedNotification">
    <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/CDStatesChangedNotification"/>
    <wsdl:input>
      <soap:body use="literal"/>
      <soap:header message="tns:CDStatesChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
      <soap:header message="tns:CDStatesChangedNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>
<wsdl:service name="CB_Server">
  <wsdl:port name="CB_ServerSoap" binding="tns:CB_ServerSoap">
    <soap:address location="http://192.168.0.233:7004/soa-
infra/services/DG/ConnectDisconnect/CB_ServerService"/>
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

4.2.2 XSD

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release"
xmlns:cpsm="cpsm_V4.1_Release" xmlns:gml="gml_V4.1_Release"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:include schemaLocation="../common/mspcommon.xsd"/>
  <xsd:import namespace="cpsm_V4.1_Release" schemaLocation="../common/cpsm.xsd"/>
  <xsd:element name="ReadingChangedNotification">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="changedMeterReads" type="tns:ArrayOfMeterReading1"
minOccurs="0"/>
        <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name="ArrayOfMeterReading1">
    <xsd:sequence>
      <xsd:element name="meterReading" type="tns:meterReading" nillable="true"
minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="meterReading" mixed="false">
    <xsd:complexContent mixed="false">
      <xsd:extension base="tns:mspObject">
        <xsd:sequence>
          <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
          <xsd:element name="deviceID" type="xsd:string" minOccurs="0"/>
          <xsd:element name="readingValues" type="tns:ArrayOfReadingValue" minOccurs="0"/>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="mspObject" abstract="true">

```

```

<xsd:sequence>
  <xsd:element name="extensions" type="tns:extensions" minOccurs="0"/>
  <xsd:element name="comments" type="xsd:string" minOccurs="0"/>
  <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
  <xsd:element name="objectName" type="xsd:string" minOccurs="0"/>
  <xsd:element name="identifiedObject" type="cpsm:IdentifiedObject" minOccurs="0"/>
</xsd:sequence>
<xsd:attribute name="objectID" type="xsd:string"/>
<xsd:attribute name="verb" type="tns:action" default="Change"/>
<xsd:attribute name="errorString" type="xsd:string"/>
<xsd:attribute name="replaceID" type="xsd:string"/>
<xsd:attribute name="utility" type="xsd:string"/>
<xsd:anyAttribute/>
</xsd:complexType>
<xsd:complexType name="extensions">
  <xsd:sequence>
    <xsd:any minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfExtensionsItem">
  <xsd:sequence>
    <xsd:element name="extensionsItem" type="tns:extensionsItem" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="extensionsItem">
  <xsd:sequence>
    <xsd:element name="extName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extValue" type="tns:extValue" minOccurs="0"/>
    <xsd:element name="extType" type="tns:extType" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="extValue">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="units" type="tns:uom"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

```



```

</xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="uom">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Acre ft"/>
    <xsd:enumeration value="Amps"/>
    <xsd:enumeration value="Amps RMS"/>
    <xsd:enumeration value="Amps squared RMS"/>
    <xsd:enumeration value="atmospheres"/>
    <xsd:enumeration value="Bar"/>
    <xsd:enumeration value="ccf"/>
    <xsd:enumeration value="ccf per Hr"/>
    <xsd:enumeration value="cm"/>
    <xsd:enumeration value="Corrosion"/>
    <xsd:enumeration value="Counter"/>
    <xsd:enumeration value="cubic feet"/>
    <xsd:enumeration value="cubic feet corrected"/>
    <xsd:enumeration value="cubic feet per Hr"/>
    <xsd:enumeration value="cubic feet per Hr corrected"/>
    <xsd:enumeration value="cubic feet per Hr uncorrected"/>
    <xsd:enumeration value="cubic feet uncorrected"/>
    <xsd:enumeration value="cubic meter"/>
    <xsd:enumeration value="cubic meter per Hr"/>
    <xsd:enumeration value="cubic meters corrected"/>
    <xsd:enumeration value="cubic meters per Hr corrected"/>
    <xsd:enumeration value="cubic meters per Hr uncorrected"/>
    <xsd:enumeration value="cubic meters uncorrected"/>
    <xsd:enumeration value="Current phase angle"/>
    <xsd:enumeration value="Date"/>
    <xsd:enumeration value="Date time"/>
    <xsd:enumeration value="deg C"/>
    <xsd:enumeration value="deg F"/>
    <xsd:enumeration value="deg K"/>
    <xsd:enumeration value="Differential pascal"/>
    <xsd:enumeration value="Differential pound per square inch"/>
    <xsd:enumeration value="dm"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

<xsd:enumeration value="Dollar"/>
<xsd:enumeration value="feet per second"/>
<xsd:enumeration value="Frequency"/>
<xsd:enumeration value="ft"/>
<xsd:enumeration value="ft of water"/>
<xsd:enumeration value="GQ"/>
<xsd:enumeration value="GQh"/>
<xsd:enumeration value="Gram square cm"/>
<xsd:enumeration value="GVA"/>
<xsd:enumeration value="GVAh"/>
<xsd:enumeration value="GVAR"/>
<xsd:enumeration value="GVARh"/>
<xsd:enumeration value="GW"/>
<xsd:enumeration value="GWh"/>
<xsd:enumeration value="IMP gl"/>
<xsd:enumeration value="IMP gl per Hr"/>
<xsd:enumeration value="inches"/>
<xsd:enumeration value="Inches H2O column"/>
<xsd:enumeration value="Inches HG column"/>
<xsd:enumeration value="inches of water"/>
<xsd:enumeration value="Interval timer"/>
<xsd:enumeration value="Ionization"/>
<xsd:enumeration value="Joules"/>
<xsd:enumeration value="Joules per Hr"/>
<xsd:enumeration value="kAmps"/>
<xsd:enumeration value="kAmps RMS"/>
<xsd:enumeration value="kAmps squared RMS"/>
<xsd:enumeration value="kJoules"/>
<xsd:enumeration value="kJoules per Hr"/>
<xsd:enumeration value="km"/>
<xsd:enumeration value="km per hour"/>
<xsd:enumeration value="km per second"/>
<xsd:enumeration value="kQ"/>
<xsd:enumeration value="kQh"/>
<xsd:enumeration value="kV"/>
<xsd:enumeration value="kV RMS"/>

```

```

<xsd:enumeration value="kVA"/>
<xsd:enumeration value="kVAh"/>
<xsd:enumeration value="kVAR"/>
<xsd:enumeration value="kVARh"/>
<xsd:enumeration value="kVsquared RMS"/>
<xsd:enumeration value="kW"/>
<xsd:enumeration value="kWh"/>
<xsd:enumeration value="liters"/>
<xsd:enumeration value="m"/>
<xsd:enumeration value="m per second"/>
<xsd:enumeration value="mAmps"/>
<xsd:enumeration value="Mamps"/>
<xsd:enumeration value="mAmps RMS"/>
<xsd:enumeration value="Mamps RMS"/>
<xsd:enumeration value="Mamps squared RMS"/>
<xsd:enumeration value="mAmps squared RMS"/>
<xsd:enumeration value="Meter HG column"/>
<xsd:enumeration value="micro m"/>
<xsd:enumeration value="microAmps"/>
<xsd:enumeration value="microAmps RMS"/>
<xsd:enumeration value="microAmps squared RMS"/>
<xsd:enumeration value="microJoules"/>
<xsd:enumeration value="microJoules per Hr"/>
<xsd:enumeration value="microQ"/>
<xsd:enumeration value="microQh"/>
<xsd:enumeration value="microV"/>
<xsd:enumeration value="microV RMS"/>
<xsd:enumeration value="microVA"/>
<xsd:enumeration value="microVAh"/>
<xsd:enumeration value="microVAR"/>
<xsd:enumeration value="microVARh"/>
<xsd:enumeration value="microVsquared RMS"/>
<xsd:enumeration value="microW"/>
<xsd:enumeration value="microWh"/>
<xsd:enumeration value="Minutes on battery"/>
<xsd:enumeration value="mJoules"/>
<xsd:enumeration value="MJoules"/>

```

```

<xsd:enumeration value="MJoules per Hr"/>
<xsd:enumeration value="mJoules per Hr"/>
<xsd:enumeration value="mm"/>
<xsd:enumeration value="mph"/>
<xsd:enumeration value="MQ"/>
<xsd:enumeration value="mQ"/>
<xsd:enumeration value="MQh"/>
<xsd:enumeration value="mQh"/>
<xsd:enumeration value="MV"/>
<xsd:enumeration value="mV"/>
<xsd:enumeration value="MV RMS"/>
<xsd:enumeration value="mV RMS"/>
<xsd:enumeration value="mVA"/>
<xsd:enumeration value="MVA"/>
<xsd:enumeration value="MVAh"/>
<xsd:enumeration value="mVAh"/>
<xsd:enumeration value="MVAR"/>
<xsd:enumeration value="mVAR"/>
<xsd:enumeration value="mVARh"/>
<xsd:enumeration value="MVARh"/>
<xsd:enumeration value="mVsquared RMS"/>
<xsd:enumeration value="MV squared RMS"/>
<xsd:enumeration value="MW"/>
<xsd:enumeration value="mW"/>
<xsd:enumeration value="mWh"/>
<xsd:enumeration value="MWh"/>
<xsd:enumeration value="Nbr of amps T.H.D. excess"/>
<xsd:enumeration value="Nbr of demand resets"/>
<xsd:enumeration value="Nbr of encoder tamper"/>
<xsd:enumeration value="Nbr of excursion high"/>
<xsd:enumeration value="Nbr of excursion low"/>
<xsd:enumeration value="Nbr of inversion"/>
<xsd:enumeration value="Nbr of physical tamper"/>
<xsd:enumeration value="Nbr of power loss"/>
<xsd:enumeration value="Nbr of power outage"/>
<xsd:enumeration value="Nbr of pulse"/>

```

```

<xsd:enumeration value="Nbr of removal"/>
<xsd:enumeration value="Nbr of reprogramming"/>
<xsd:enumeration value="Nbr of reverse rotation"/>
<xsd:enumeration value="Nbr of sag"/>
<xsd:enumeration value="Nbr of swells"/>
<xsd:enumeration value="Nbr of times programmed"/>
<xsd:enumeration value="Nbr of V T.H.D. excess"/>
<xsd:enumeration value="Nbr of voltage unbalance"/>
<xsd:enumeration value="Nbr of watchdog"/>
<xsd:enumeration value="Normal voltage period"/>
<xsd:enumeration value="percent"/>
<xsd:enumeration value="percent relative humidity"/>
<xsd:enumeration value="PH factor"/>
<xsd:enumeration value="pounds per square foot"/>
<xsd:enumeration value="Power factor"/>
<xsd:enumeration value="PPM chlorine"/>
<xsd:enumeration value="PPM lead"/>
<xsd:enumeration value="PPM odorant"/>
<xsd:enumeration value="PPM SO2"/>
<xsd:enumeration value="Q"/>
<xsd:enumeration value="Qh"/>
<xsd:enumeration value="Sense input"/>
<xsd:enumeration value="Static pascal"/>
<xsd:enumeration value="Static pound per square inch"/>
<xsd:enumeration value="T.H.D. Current"/>
<xsd:enumeration value="T.H.D. Voltage"/>
<xsd:enumeration value="Therm"/>
<xsd:enumeration value="Therm per Hr"/>
<xsd:enumeration value="Time"/>
<xsd:enumeration value="turbidity"/>
<xsd:enumeration value="US gl"/>
<xsd:enumeration value="US gl per Hr"/>
<xsd:enumeration value="V"/>
<xsd:enumeration value="V RMS"/>
<xsd:enumeration value="VA"/>
<xsd:enumeration value="VAh"/>
<xsd:enumeration value="VAR"/>

```

```

    <xsd:enumeration value="VARh"/>
    <xsd:enumeration value="Voltage phase angle"/>
    <xsd:enumeration value="Vsquared RMS"/>
    <xsd:enumeration value="W"/>
    <xsd:enumeration value="Wh"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="extType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="anySimpleType"/>
    <xsd:enumeration value="anyType"/>
    <xsd:enumeration value="anyURI"/>
    <xsd:enumeration value="base64Binary"/>
    <xsd:enumeration value="boolean"/>
    <xsd:enumeration value="byte"/>
    <xsd:enumeration value="date"/>
    <xsd:enumeration value="dateTime"/>
    <xsd:enumeration value="decimal"/>
    <xsd:enumeration value="double"/>
    <xsd:enumeration value="duration"/>
    <xsd:enumeration value="ENTITIES"/>
    <xsd:enumeration value="ENTITY"/>
    <xsd:enumeration value="float"/>
    <xsd:enumeration value="gDay"/>
    <xsd:enumeration value="gMonth"/>
    <xsd:enumeration value="gMonthDay"/>
    <xsd:enumeration value="gYear"/>
    <xsd:enumeration value="gYearMonth"/>
    <xsd:enumeration value="hexBinary"/>
    <xsd:enumeration value="ID"/>
    <xsd:enumeration value="IDREF"/>
    <xsd:enumeration value="IDREFS"/>
    <xsd:enumeration value="int"/>
    <xsd:enumeration value="integer"/>
    <xsd:enumeration value="language"/>
    <xsd:enumeration value="long"/>

```

```

    <xsd:enumeration value="Name"/>
    <xsd:enumeration value="NCName"/>
    <xsd:enumeration value="negativeInteger"/>
    <xsd:enumeration value="NMTOKEN"/>
    <xsd:enumeration value="NMTOKENS"/>
    <xsd:enumeration value="nonNegativeInteger"/>
    <xsd:enumeration value="nonPositiveInteger"/>
    <xsd:enumeration value="normalizedString"/>
    <xsd:enumeration value="NOTATION"/>
    <xsd:enumeration value="positiveInteger"/>
    <xsd:enumeration value="QName"/>
    <xsd:enumeration value="short"/>
    <xsd:enumeration value="string"/>
    <xsd:enumeration value="time"/>
    <xsd:enumeration value="token"/>
    <xsd:enumeration value="unsignedByte"/>
    <xsd:enumeration value="unsignedInt"/>
    <xsd:enumeration value="unsignedLong"/>
    <xsd:enumeration value="unsignedShort"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="action">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="New"/>
    <xsd:enumeration value="Change"/>
    <xsd:enumeration value="Delete"/>
    <xsd:enumeration value="Replace"/>
    <xsd:enumeration value="Link"/>
    <xsd:enumeration value="Unlink"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="ArrayOfReadingValue">
  <xsd:sequence>
    <xsd:element name="readingValue" type="tns:readingValue" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>

```

```

<xsd:complexType name="readingValue">
  <xsd:sequence>
    <xsd:element name="extensions" type="tns:extensions" minOccurs="0"/>
    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
    <xsd:element name="units" type="tns:uom" minOccurs="0"/>
    <xsd:element name="value" type="xsd:string" minOccurs="0"/>
    <xsd:element name="ratePeriod" type="xsd:string" minOccurs="0"/>
    <xsd:element name="readingType" type="xsd:string" minOccurs="0"/>
    <xsd:element name="fieldName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="name" type="xsd:string" minOccurs="0"/>
    <xsd:element name="measurementPeriod" type="tns:measurementPeriod" minOccurs="0"/>
    <xsd:element name="timeStamp" type="xsd:dateTime" minOccurs="0"/>
    <xsd:element name="readingStatusCode" type="tns:readingStatusCode" minOccurs="0"/>
    <xsd:element name="readingTypeCode" type="tns:readingTypeCode" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="measurementPeriod">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Current"/>
    <xsd:enumeration value="Previous"/>
    <xsd:enumeration value="Previous Season"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="readingStatusCode">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="originatingSystemID" type="xsd:string"/>
      <xsd:attribute name="codeCategory" type="xsd:string"/>
      <xsd:attribute name="codeIndex" type="xsd:string"/>
      <xsd:anyAttribute/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="readingTypeCode">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">

```



```

    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="timeAttribute" type="xsd:string"/>
    <xsd:attribute name="dataQualifier" type="xsd:string"/>
    <xsd:attribute name="accumulationBehavior" type="xsd:string"/>
    <xsd:attribute name="flowDirection" type="xsd:string"/>
    <xsd:attribute name="UOMCategory" type="xsd:string"/>
    <xsd:attribute name="measurementCategory" type="xsd:string"/>
    <xsd:attribute name="phaseIndex" type="xsd:string"/>
    <xsd:attribute name="unitsMultiplier" type="xsd:string"/>
    <xsd:attribute name="displayableUOM" type="xsd:string"/>
    <xsd:anyAttribute/>
  </xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:element name="ReadingChangedNotificationResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="ReadingChangedNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="CDStateChangedNotification">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="stateChange" type="tns:CDStateChange" minOccurs="0"/>
      <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:complexType name="CDStateChange" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:msoObject">
      <xsd:sequence>
        <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
        <xsd:element name="stateChange" type="tns:loadActionCode" minOccurs="0"/>
        <xsd:element name="meterEvent" type="tns:meterEvent" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>

```

```

    </xsd:sequence>
  </xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:simpleType name="loadActionCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Connect"/>
    <xsd:enumeration value="Disconnect"/>
    <xsd:enumeration value="InitiatePowerLimitation"/>
    <xsd:enumeration value="Opened"/>
    <xsd:enumeration value="Closed"/>
    <xsd:enumeration value="Open"/>
    <xsd:enumeration value="Close"/>
    <xsd:enumeration value="Armed"/>
    <xsd:enumeration value="Enabled"/>
    <xsd:enumeration value="Disabled"/>
    <xsd:enumeration value="Arm"/>
    <xsd:enumeration value="Enable"/>
    <xsd:enumeration value="Disable"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="meterEvent">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="domain" type="xsd:string"/>
      <xsd:attribute name="domainPart" type="xsd:string"/>
      <xsd:attribute name="type" type="xsd:string"/>
      <xsd:attribute name="index" type="xsd:string"/>
      <xsd:attribute name="value" type="xsd:string"/>
      <xsd:attribute name="codeString" type="xsd:string"/>
      <xsd:anyAttribute/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:element name="CDStateChangedNotificationResponse">

```

```

<xsd:complexType>
  <xsd:sequence>
    <xsd:element name="CDStateChangedNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name="CDStatesChangedNotification">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="stateChanges" type="tns:ArrayOfCDStateChange" minOccurs="0"/>
      <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:complexType name="ArrayOfCDStateChange">
  <xsd:sequence>
    <xsd:element name="CDStateChange" type="tns:CDStateChange" nillable="true"
minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="CDStatesChangedNotificationResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="CDStatesChangedNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xsd:schema>

```

4.3 CD_Server

4.3.1 WSDL

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

```

<wsdl:definitions targetNamespace="http://www.multispeak.org/Version_4.1_Release"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:s3="http://www.w3.org/1999/xlink"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:s1="cpsm_V4.1_Release"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s2="gml_V4.1_Release"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.multispeak.org/Version_4.1_Release">
      <s:include schemaLocation="CD_Server.xsd"/>
    </s:schema>
    <s:schema elementFormDefault="qualified" targetNamespace="cpsm_V4.1_Release">
      <s:include schemaLocation="../common/cpsm.xsd"/>
    </s:schema>
  </wsdl:types>
  <wsdl:message name="InitiateConnectDisconnectSoapIn">
    <wsdl:part name="parameters" element="tns:InitiateConnectDisconnect"/>
  </wsdl:message>
  <wsdl:message name="InitiateConnectDisconnectSoapOut">
    <wsdl:part name="parameters" element="tns:InitiateConnectDisconnectResponse"/>
  </wsdl:message>
  <wsdl:message name="InitiateConnectDisconnectMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
  </wsdl:message>
  <wsdl:portType name="CD_ServerSoap">
    <wsdl:operation name="InitiateConnectDisconnect">
      <wsdl:documentation>CB
                                initiates
                                a
                                connect

```

or
disconnect
action
by
issuing
one or
more
connectDisconnectEvent
objects
to the
CD. CD
returns
information
about
failed
transactions
by
returning
an array
of
errorObjects.
The
connect/disconnect
function
returns
information
about
this
action
using
the
CDStateChangedNotification
to the
URL
specified
in the
responseURL

calling
parameter
and
references
the
transactionID
specified
to link
the
transaction
to this
Initiate
request.The
expiration
time
parameter
indicates
the
amount
of time
for
which
the
publisher
should
try to
obtain
and
publish
the
data; if
the
publisher
has been
unsuccessful
in

publishing
the data
after
the
expiration
time,
then the
publisher
will
discard
the
request
and the
requestor
should
not
expect a
response.</wsdl:documentation>

```
<wsdl:input message="tns:InitiateConnectDisconnectSoapIn"/>
<wsdl:output message="tns:InitiateConnectDisconnectSoapOut"/>
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="CD_ServerSoap" type="tns:CD_ServerSoap">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="InitiateConnectDisconnect">
    <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateConnectDisconnect"/>
    <wsdl:input>
      <soap:body use="literal"/>
      <soap:header message="tns:InitiateConnectDisconnectMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
      <soap:header message="tns:InitiateConnectDisconnectMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:output>
```

```

    </wsdl:operation>
  </wsdl:binding>
  <wsdl:service name="CD_Server">
    <wsdl:port name="CD_ServerSoap_pt" binding="tns:CD_ServerSoap">
      <soap:address location="http://192.168.0.233:7004/soa-
infra/services/DG_Test/DGTestHarness/CD_Server"/>
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>

```

4.3.2 XSD

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release"
xmlns:cpsm="cpsm_V4.1_Release">
  <xsd:include schemaLocation="../common/mspcommon.xsd"/>
  <xsd:element name="InitiateConnectDisconnect">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="cdEvents" type="tns:ArrayOfConnectDisconnectEvent"
minOccurs="0"/>
        <xsd:element name="responseURL" type="xsd:string" minOccurs="0"/>
        <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="expTime" type="tns:expirationTime" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name="ArrayOfConnectDisconnectEvent">
    <xsd:sequence>
      <xsd:element name="connectDisconnectEvent" type="tns:connectDisconnectEvent"
minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>

```



```

</xsd:complexType>
<xsd:complexType name="connectDisconnectEvent" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:msoObject">
      <xsd:sequence>
        <xsd:element name="serviceLocationID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="customerID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="gridLocation" type="xsd:string" minOccurs="0"/>
        <xsd:element name="accountNumber" type="xsd:string" minOccurs="0"/>
        <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
        <xsd:element name="loadActionCode" type="tns:loadActionCode" minOccurs="0"/>
        <xsd:element name="powerLimitationValue" type="tns:powerLimitationValue"
minOccurs="0"/>
        <xsd:element name="CDReasonCode" type="tns:CDReasonCode" minOccurs="0"/>
        <xsd:element name="amountDue" type="tns:money" minOccurs="0"/>
        <xsd:element name="serviceType" type="tns:serviceType" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="powerLimitationValue">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="tns:powerLimitationUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="powerLimitationUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="kWh"/>
    <xsd:enumeration value="kW"/>
    <xsd:enumeration value="A"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="CDReasonCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

    <xsd:enumeration value="PPMBalanceNegative"/>
    <xsd:enumeration value="PPMBalancePositive"/>
    <xsd:enumeration value="NonPayment"/>
    <xsd:enumeration value="ServiceInactive"/>
    <xsd:enumeration value="PaymentAgreement"/>
    <xsd:enumeration value="PaymentReceived"/>
    <xsd:enumeration value="NewCustomer"/>
    <xsd:enumeration value="ServiceRestored"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="money">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="currencyCode" type="tns:currencyCode"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="currencyCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="USD"/>
    <xsd:enumeration value="EUR"/>
    <xsd:enumeration value="ADF"/>
    <xsd:enumeration value="ADP"/>
    <xsd:enumeration value="AED"/>
    <xsd:enumeration value="AFN"/>
    <xsd:enumeration value="ALL"/>
    <xsd:enumeration value="AMD"/>
    <xsd:enumeration value="ANG"/>
    <xsd:enumeration value="AOA"/>
    <xsd:enumeration value="ARS"/>
    <xsd:enumeration value="ATS"/>
    <xsd:enumeration value="AUD"/>
    <xsd:enumeration value="AWG"/>
    <xsd:enumeration value="AZN"/>
    <xsd:enumeration value="BAM"/>
  </xsd:restriction>

```

```
<xsd:enumeration value="BBD"/>
<xsd:enumeration value="BDT"/>
<xsd:enumeration value="BEF"/>
<xsd:enumeration value="BGN"/>
<xsd:enumeration value="BHD"/>
<xsd:enumeration value="BIF"/>
<xsd:enumeration value="BMD"/>
<xsd:enumeration value="BND"/>
<xsd:enumeration value="BOB"/>
<xsd:enumeration value="BOV"/>
<xsd:enumeration value="BRL"/>
<xsd:enumeration value="BSD"/>
<xsd:enumeration value="BTN"/>
<xsd:enumeration value="BWP"/>
<xsd:enumeration value="BYR"/>
<xsd:enumeration value="BZD"/>
<xsd:enumeration value="CAD"/>
<xsd:enumeration value="CDF"/>
<xsd:enumeration value="CHE"/>
<xsd:enumeration value="CHF"/>
<xsd:enumeration value="CHW"/>
<xsd:enumeration value="CLF"/>
<xsd:enumeration value="CLP"/>
<xsd:enumeration value="CNY"/>
<xsd:enumeration value="COP"/>
<xsd:enumeration value="COU"/>
<xsd:enumeration value="CRC"/>
<xsd:enumeration value="CUP"/>
<xsd:enumeration value="CVE"/>
<xsd:enumeration value="CYP"/>
<xsd:enumeration value="CZK"/>
<xsd:enumeration value="DEM"/>
<xsd:enumeration value="DJF"/>
<xsd:enumeration value="DKK"/>
<xsd:enumeration value="DOP"/>
<xsd:enumeration value="DZD"/>
<xsd:enumeration value="EEK"/>
```

```
<xsd:enumeration value="EGP"/>
<xsd:enumeration value="ERN"/>
<xsd:enumeration value="ESP"/>
<xsd:enumeration value="ETB"/>
<xsd:enumeration value="FIM"/>
<xsd:enumeration value="FJD"/>
<xsd:enumeration value="FKP"/>
<xsd:enumeration value="FRF"/>
<xsd:enumeration value="GBP"/>
<xsd:enumeration value="GEL"/>
<xsd:enumeration value="GHS"/>
<xsd:enumeration value="GIP"/>
<xsd:enumeration value="GMD"/>
<xsd:enumeration value="GNF"/>
<xsd:enumeration value="GRD"/>
<xsd:enumeration value="GTQ"/>
<xsd:enumeration value="GYD"/>
<xsd:enumeration value="HKD"/>
<xsd:enumeration value="HNL"/>
<xsd:enumeration value="HRK"/>
<xsd:enumeration value="HTG"/>
<xsd:enumeration value="HUF"/>
<xsd:enumeration value="IDR"/>
<xsd:enumeration value="IEP"/>
<xsd:enumeration value="ILS"/>
<xsd:enumeration value="INR"/>
<xsd:enumeration value="IQD"/>
<xsd:enumeration value="IRR"/>
<xsd:enumeration value="ISK"/>
<xsd:enumeration value="ITL"/>
<xsd:enumeration value="JMD"/>
<xsd:enumeration value="JOD"/>
<xsd:enumeration value="JPY"/>
<xsd:enumeration value="KES"/>
<xsd:enumeration value="KGS"/>
<xsd:enumeration value="KHR"/>
```

```
<xsd:enumeration value="KMF"/>
<xsd:enumeration value="KPW"/>
<xsd:enumeration value="KRW"/>
<xsd:enumeration value="KWD"/>
<xsd:enumeration value="KYD"/>
<xsd:enumeration value="KZT"/>
<xsd:enumeration value="LAK"/>
<xsd:enumeration value="LBP"/>
<xsd:enumeration value="LKR"/>
<xsd:enumeration value="LRD"/>
<xsd:enumeration value="LSL"/>
<xsd:enumeration value="LTL"/>
<xsd:enumeration value="LUF"/>
<xsd:enumeration value="LVL"/>
<xsd:enumeration value="LYD"/>
<xsd:enumeration value="MAD"/>
<xsd:enumeration value="MCF"/>
<xsd:enumeration value="MDL"/>
<xsd:enumeration value="MGA"/>
<xsd:enumeration value="MKD"/>
<xsd:enumeration value="MMK"/>
<xsd:enumeration value="MNT"/>
<xsd:enumeration value="MOP"/>
<xsd:enumeration value="MRO"/>
<xsd:enumeration value="MTL"/>
<xsd:enumeration value="MUR"/>
<xsd:enumeration value="MVR"/>
<xsd:enumeration value="MWK"/>
<xsd:enumeration value="MXN"/>
<xsd:enumeration value="MXV"/>
<xsd:enumeration value="MYR"/>
<xsd:enumeration value="MZN"/>
<xsd:enumeration value="NAD"/>
<xsd:enumeration value="NGN"/>
<xsd:enumeration value="NIO"/>
<xsd:enumeration value="NLG"/>
<xsd:enumeration value="NOK"/>
```

```
<xsd:enumeration value="NPR"/>
<xsd:enumeration value="NZD"/>
<xsd:enumeration value="OMR"/>
<xsd:enumeration value="PAB"/>
<xsd:enumeration value="PEN"/>
<xsd:enumeration value="PGK"/>
<xsd:enumeration value="PHP"/>
<xsd:enumeration value="PKR"/>
<xsd:enumeration value="PLN"/>
<xsd:enumeration value="PTE"/>
<xsd:enumeration value="PYG"/>
<xsd:enumeration value="QAR"/>
<xsd:enumeration value="RON"/>
<xsd:enumeration value="RSD"/>
<xsd:enumeration value="RUB"/>
<xsd:enumeration value="RWF"/>
<xsd:enumeration value="SAR"/>
<xsd:enumeration value="SBD"/>
<xsd:enumeration value="SCR"/>
<xsd:enumeration value="SDG"/>
<xsd:enumeration value="SEK"/>
<xsd:enumeration value="SGD"/>
<xsd:enumeration value="SHP"/>
<xsd:enumeration value="SIT"/>
<xsd:enumeration value="SKK"/>
<xsd:enumeration value="SLL"/>
<xsd:enumeration value="SML"/>
<xsd:enumeration value="SOS"/>
<xsd:enumeration value="SRD"/>
<xsd:enumeration value="STD"/>
<xsd:enumeration value="SYP"/>
<xsd:enumeration value="SZL"/>
<xsd:enumeration value="THB"/>
<xsd:enumeration value="TJS"/>
<xsd:enumeration value="TMM"/>
<xsd:enumeration value="TND"/>
```

```
<xsd:enumeration value="TOP"/>
<xsd:enumeration value="TRY"/>
<xsd:enumeration value="TTD"/>
<xsd:enumeration value="TWD"/>
<xsd:enumeration value="TZS"/>
<xsd:enumeration value="UAH"/>
<xsd:enumeration value="UGX"/>
<xsd:enumeration value="USN"/>
<xsd:enumeration value="USS"/>
<xsd:enumeration value="UYU"/>
<xsd:enumeration value="UZS"/>
<xsd:enumeration value="VAL"/>
<xsd:enumeration value="VEF"/>
<xsd:enumeration value="VND"/>
<xsd:enumeration value="VUV"/>
<xsd:enumeration value="WST"/>
<xsd:enumeration value="XAF"/>
<xsd:enumeration value="XAG"/>
<xsd:enumeration value="XAU"/>
<xsd:enumeration value="XBA"/>
<xsd:enumeration value="XBB"/>
<xsd:enumeration value="XBC"/>
<xsd:enumeration value="XBD"/>
<xsd:enumeration value="XCD"/>
<xsd:enumeration value="XDR"/>
<xsd:enumeration value="XEU"/>
<xsd:enumeration value="XFU"/>
<xsd:enumeration value="XOF"/>
<xsd:enumeration value="XPD"/>
<xsd:enumeration value="XPF"/>
<xsd:enumeration value="XPT"/>
<xsd:enumeration value="XTS"/>
<xsd:enumeration value="XXX"/>
<xsd:enumeration value="YER"/>
<xsd:enumeration value="ZAR"/>
<xsd:enumeration value="ZMK"/>
<xsd:enumeration value="ZWD"/>
```

```

    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="expirationTime">
  <xsd:simpleContent>
    <xsd:extension base="tns:time"/>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="time">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="tns:timeUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="timeUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Milliseconds"/>
    <xsd:enumeration value="Seconds"/>
    <xsd:enumeration value="Minutes"/>
    <xsd:enumeration value="Hours"/>
    <xsd:enumeration value="Days"/>
    <xsd:enumeration value="Weeks"/>
    <xsd:enumeration value="Months"/>
    <xsd:enumeration value="Years"/>
    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:element name="InitiateConnectDisconnectResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="InitiateConnectDisconnectResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

```



```
</xsd:schema>
```

4.4 OA_Server

4.4.1 WSDL

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions targetNamespace="http://www.multispeak.org/Version_4.1_Release"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:s3="http://www.w3.org/1999/xlink"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:s1="cpsm_V4.1_Release"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s2="gml_V4.1_Release"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.multispeak.org/Version_4.1_Release">
      <s:include schemaLocation="OA_Server.xsd"/>
    </s:schema>
    <s:schema elementFormDefault="qualified" targetNamespace="cpsm_V4.1_Release">
      <s:include schemaLocation="../common/cpsm.xsd"/>
    </s:schema>
  </wsdl:types>
  <wsdl:message name="ODEventNotificationSoapIn">
    <wsdl:part name="parameters" element="tns:ODEventNotification"/>
  </wsdl:message>
  <wsdl:message name="ODEventNotificationSoapOut">
    <wsdl:part name="parameters" element="tns:ODEventNotificationResponse"/>
  </wsdl:message>
  <wsdl:message name="ODEventNotificationMultiSpeakMsgHeader">
    <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
  </wsdl:message>
```

```
</wsdl:message>
<wsdl:portType name="OA_ServerSoap">
  <wsdl:operation name="ODEventNotification">
    <wsdl:documentation>Publisher
      notifies
      OA of a
      change
      in
      OutageDetectionEvents
      by
      sending
      an array
      of
      changed
      OutageDetectionEvent
      objects.
      OA
      returns
      information
      about
      failed
      transactions
      using an
      array of
      errorObjects.
      The
      message
      header
      attribute
      'registrationID'
      should
      be added
      to all
      publish
      messages
      to
```

indicate
to the
subscriber
under
which
registrationID
they
received
this
notification
data.</wsdl:documentation>

```
<wsdl:input message="tns:ODEventNotificationSoapIn"/>
<wsdl:output message="tns:ODEventNotificationSoapOut"/>
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="OA_ServerSoap" type="tns:OA_ServerSoap">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="ODEventNotification">
    <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/ODEventNotification"/>
    <wsdl:input>
      <soap:body use="literal"/>
      <soap:header message="tns:ODEventNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
      <soap:header message="tns:ODEventNotificationMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>
<wsdl:service name="OA_Server">
  <wsdl:port name="OA_ServerSoap" binding="tns:OA_ServerSoap">
    <soap:address location="http://192.168.0.233:7004/soa-
infra/services/DG/DeviceStatusCheck/OA_ServerService"/>
  </wsdl:port>
```

```
</wsdl:service>
</wsdl:definitions>
```

4.4.2 XSD

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release"
xmlns:cpsm="cpsm_V4.1_Release" xmlns:gml="gml_V4.1_Release">
  <xsd:include schemaLocation="../common/mspcommon.xsd"/>
  <xsd:import namespace="cpsm_V4.1_Release" schemaLocation="../common/cpsm.xsd"/>
  <xsd:element name="ODEventNotification">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="ODEvents" type="tns:ArrayOfOutageDetectionEvent"
minOccurs="0"/>
        <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name="ArrayOfOutageDetectionEvent">
    <xsd:sequence>
      <xsd:element name="outageDetectionEvent" type="tns:outageDetectionEvent"
nillable="true" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="outageDetectionEvent" mixed="false">
    <xsd:complexContent mixed="false">
      <xsd:extension base="tns:mspObject">
        <xsd:sequence>
          <xsd:element name="phaseCode" type="tns:phaseCode" minOccurs="0"/>
          <xsd:element name="eventTime" type="xsd:dateTime" minOccurs="0"/>
          <xsd:element name="outageEventType" type="tns:outageEventType" minOccurs="0"/>

```

```

<xsd:element name="outageDetectionDeviceID" type="xsd:string" minOccurs="0"/>
<xsd:element name="outageDetectionDeviceType" type="tns:outageDetectDeviceType"
minOccurs="0"/>
<xsd:element name="outageLocation" type="tns:outageLocation" minOccurs="0"/>
<xsd:element name="messageList" type="tns:ArrayOfMessage" minOccurs="0"/>
<xsd:element name="outageCustomer" type="tns:outageCustomer" minOccurs="0"/>
<xsd:element name="priority" type="tns:priorityType" minOccurs="0"/>
<xsd:element name="percentConfident" type="xsd:integer" minOccurs="0"/>
<xsd:element name="problemCode" type="xsd:string" minOccurs="0"/>
<xsd:element name="resolvedLevel" type="tns:resolvedLevel" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="mspObject" abstract="true">
<xsd:sequence>
<xsd:element name="extensions" type="tns:extensions" minOccurs="0"/>
<xsd:element name="comments" type="xsd:string" minOccurs="0"/>
<xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
<xsd:element name="objectName" type="xsd:string" minOccurs="0"/>
<xsd:element name="identifiedObject" type="cpsm:IdentifiedObject" minOccurs="0"/>
</xsd:sequence>
<xsd:attribute name="objectID" type="xsd:string"/>
<xsd:attribute name="verb" type="tns:action" default="Change"/>
<xsd:attribute name="errorString" type="xsd:string"/>
<xsd:attribute name="replaceID" type="xsd:string"/>
<xsd:attribute name="utility" type="xsd:string"/>
<xsd:anyAttribute/>
</xsd:complexType>
<xsd:complexType name="extensions">
<xsd:sequence>
<xsd:any minOccurs="0" maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfExtensionsItem">
<xsd:sequence>
<xsd:element name="extensionsItem" type="tns:extensionsItem" minOccurs="0"

```

```

maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="extensionsItem">
  <xsd:sequence>
    <xsd:element name="extName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extValue" type="tns:extValue" minOccurs="0"/>
    <xsd:element name="extType" type="tns:extType" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="extValue">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="units" type="tns:uom"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="uom">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Acre ft"/>
    <xsd:enumeration value="Amps"/>
    <xsd:enumeration value="Amps RMS"/>
    <xsd:enumeration value="Amps squared RMS"/>
    <xsd:enumeration value="atmospheres"/>
    <xsd:enumeration value="Bar"/>
    <xsd:enumeration value="ccf"/>
    <xsd:enumeration value="ccf per Hr"/>
    <xsd:enumeration value="cm"/>
    <xsd:enumeration value="Corrosion"/>
    <xsd:enumeration value="Counter"/>
    <xsd:enumeration value="cubic feet"/>
    <xsd:enumeration value="cubic feet corrected"/>
    <xsd:enumeration value="cubic feet per Hr"/>
    <xsd:enumeration value="cubic feet per Hr corrected"/>
    <xsd:enumeration value="cubic feet per Hr uncorrected"/>
    <xsd:enumeration value="cubic feet uncorrected"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

<xsd:enumeration value="cubic meter"/>
<xsd:enumeration value="cubic meter per Hr"/>
<xsd:enumeration value="cubic meters corrected"/>
<xsd:enumeration value="cubic meters per Hr corrected"/>
<xsd:enumeration value="cubic meters per Hr uncorrected"/>
<xsd:enumeration value="cubic meters uncorrected"/>
<xsd:enumeration value="Current phase angle"/>
<xsd:enumeration value="Date"/>
<xsd:enumeration value="Date time"/>
<xsd:enumeration value="deg C"/>
<xsd:enumeration value="deg F"/>
<xsd:enumeration value="deg K"/>
<xsd:enumeration value="Differential pascal"/>
<xsd:enumeration value="Differential pound per square inch"/>
<xsd:enumeration value="dm"/>
<xsd:enumeration value="Dollar"/>
<xsd:enumeration value="feet per second"/>
<xsd:enumeration value="Frequency"/>
<xsd:enumeration value="ft"/>
<xsd:enumeration value="ft of water"/>
<xsd:enumeration value="GQ"/>
<xsd:enumeration value="GQh"/>
<xsd:enumeration value="Gram square cm"/>
<xsd:enumeration value="GVA"/>
<xsd:enumeration value="GVAh"/>
<xsd:enumeration value="GVAR"/>
<xsd:enumeration value="GVARh"/>
<xsd:enumeration value="GW"/>
<xsd:enumeration value="GWh"/>
<xsd:enumeration value="IMP gl"/>
<xsd:enumeration value="IMP gl per Hr"/>
<xsd:enumeration value="inches"/>
<xsd:enumeration value="Inches H2O column"/>
<xsd:enumeration value="Inches HG column"/>
<xsd:enumeration value="inches of water"/>
<xsd:enumeration value="Interval timer"/>
<xsd:enumeration value="Ionization"/>

```

```
<xsd:enumeration value="Joules"/>
<xsd:enumeration value="Joules per Hr"/>
<xsd:enumeration value="kAmps"/>
<xsd:enumeration value="kAmps RMS"/>
<xsd:enumeration value="kAmps squared RMS"/>
<xsd:enumeration value="kJoules"/>
<xsd:enumeration value="kJoules per Hr"/>
<xsd:enumeration value="km"/>
<xsd:enumeration value="km per hour"/>
<xsd:enumeration value="km per second"/>
<xsd:enumeration value="kQ"/>
<xsd:enumeration value="kQh"/>
<xsd:enumeration value="kV"/>
<xsd:enumeration value="kV RMS"/>
<xsd:enumeration value="kVA"/>
<xsd:enumeration value="kVAh"/>
<xsd:enumeration value="kVAR"/>
<xsd:enumeration value="kVARh"/>
<xsd:enumeration value="kVsquared RMS"/>
<xsd:enumeration value="kW"/>
<xsd:enumeration value="kWh"/>
<xsd:enumeration value="liters"/>
<xsd:enumeration value="m"/>
<xsd:enumeration value="m per second"/>
<xsd:enumeration value="mAmps"/>
<xsd:enumeration value="Mamps"/>
<xsd:enumeration value="mAmps RMS"/>
<xsd:enumeration value="Mamps RMS"/>
<xsd:enumeration value="Mamps squared RMS"/>
<xsd:enumeration value="mAmps squared RMS"/>
<xsd:enumeration value="Meter HG column"/>
<xsd:enumeration value="micro m"/>
<xsd:enumeration value="microAmps"/>
<xsd:enumeration value="microAmps RMS"/>
<xsd:enumeration value="microAmps squared RMS"/>
<xsd:enumeration value="microJoules"/>
```



```

<xsd:enumeration value="microJoules per Hr"/>
<xsd:enumeration value="microQ"/>
<xsd:enumeration value="microQh"/>
<xsd:enumeration value="microV"/>
<xsd:enumeration value="microV RMS"/>
<xsd:enumeration value="microVA"/>
<xsd:enumeration value="microVAh"/>
<xsd:enumeration value="microVAR"/>
<xsd:enumeration value="microVARh"/>
<xsd:enumeration value="microVsquared RMS"/>
<xsd:enumeration value="microW"/>
<xsd:enumeration value="microWh"/>
<xsd:enumeration value="Minutes on battery"/>
<xsd:enumeration value="mJoules"/>
<xsd:enumeration value="MJoules"/>
<xsd:enumeration value="MJoules per Hr"/>
<xsd:enumeration value="mJoules per Hr"/>
<xsd:enumeration value="mm"/>
<xsd:enumeration value="mph"/>
<xsd:enumeration value="MQ"/>
<xsd:enumeration value="mQ"/>
<xsd:enumeration value="MQh"/>
<xsd:enumeration value="mQh"/>
<xsd:enumeration value="MV"/>
<xsd:enumeration value="mV"/>
<xsd:enumeration value="MV RMS"/>
<xsd:enumeration value="mV RMS"/>
<xsd:enumeration value="mVA"/>
<xsd:enumeration value="MVA"/>
<xsd:enumeration value="MVAh"/>
<xsd:enumeration value="mVAh"/>
<xsd:enumeration value="MVAR"/>
<xsd:enumeration value="mVAR"/>
<xsd:enumeration value="mVARh"/>
<xsd:enumeration value="MVARh"/>
<xsd:enumeration value="mVsquared RMS"/>
<xsd:enumeration value="MV squared RMS"/>

```

```

<xsd:enumeration value="MW"/>
<xsd:enumeration value="mW"/>
<xsd:enumeration value="mWh"/>
<xsd:enumeration value="MWh"/>
<xsd:enumeration value="Nbr of amps T.H.D. excess"/>
<xsd:enumeration value="Nbr of demand resets"/>
<xsd:enumeration value="Nbr of encoder tamper"/>
<xsd:enumeration value="Nbr of excursion high"/>
<xsd:enumeration value="Nbr of excursion low"/>
<xsd:enumeration value="Nbr of inversion"/>
<xsd:enumeration value="Nbr of physical tamper"/>
<xsd:enumeration value="Nbr of power loss"/>
<xsd:enumeration value="Nbr of power outage"/>
<xsd:enumeration value="Nbr of pulse"/>
<xsd:enumeration value="Nbr of removal"/>
<xsd:enumeration value="Nbr of reprogramming"/>
<xsd:enumeration value="Nbr of reverse rotation"/>
<xsd:enumeration value="Nbr of sag"/>
<xsd:enumeration value="Nbr of swells"/>
<xsd:enumeration value="Nbr of times programmed"/>
<xsd:enumeration value="Nbr of V T.H.D. excess"/>
<xsd:enumeration value="Nbr of voltage unbalance"/>
<xsd:enumeration value="Nbr of watchdog"/>
<xsd:enumeration value="Normal voltage period"/>
<xsd:enumeration value="percent"/>
<xsd:enumeration value="percent relative humidity"/>
<xsd:enumeration value="PH factor"/>
<xsd:enumeration value="pounds per square foot"/>
<xsd:enumeration value="Power factor"/>
<xsd:enumeration value="PPM chlorine"/>
<xsd:enumeration value="PPM lead"/>
<xsd:enumeration value="PPM odorant"/>
<xsd:enumeration value="PPM SO2"/>
<xsd:enumeration value="Q"/>
<xsd:enumeration value="Qh"/>
<xsd:enumeration value="Sense input"/>

```

```

<xsd:enumeration value="Static pascal"/>
<xsd:enumeration value="Static pound per square inch"/>
<xsd:enumeration value="T.H.D. Current"/>
<xsd:enumeration value="T.H.D. Voltage"/>
<xsd:enumeration value="Therm"/>
<xsd:enumeration value="Therm per Hr"/>
<xsd:enumeration value="Time"/>
<xsd:enumeration value="turbidity"/>
<xsd:enumeration value="US gl"/>
<xsd:enumeration value="US gl per Hr"/>
<xsd:enumeration value="V"/>
<xsd:enumeration value="V RMS"/>
<xsd:enumeration value="VA"/>
<xsd:enumeration value="VAh"/>
<xsd:enumeration value="VAR"/>
<xsd:enumeration value="VARh"/>
<xsd:enumeration value="Voltage phase angle"/>
<xsd:enumeration value="Vsquared RMS"/>
<xsd:enumeration value="W"/>
<xsd:enumeration value="Wh"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="extType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="anySimpleType"/>
    <xsd:enumeration value="anyType"/>
    <xsd:enumeration value="anyURI"/>
    <xsd:enumeration value="base64Binary"/>
    <xsd:enumeration value="boolean"/>
    <xsd:enumeration value="byte"/>
    <xsd:enumeration value="date"/>
    <xsd:enumeration value="dateTime"/>
    <xsd:enumeration value="decimal"/>
    <xsd:enumeration value="double"/>
    <xsd:enumeration value="duration"/>
    <xsd:enumeration value="ENTITIES"/>
    <xsd:enumeration value="ENTITY"/>
  
```

```
<xsd:enumeration value="float"/>
<xsd:enumeration value="gDay"/>
<xsd:enumeration value="gMonth"/>
<xsd:enumeration value="gMonthDay"/>
<xsd:enumeration value="gYear"/>
<xsd:enumeration value="gYearMonth"/>
<xsd:enumeration value="hexBinary"/>
<xsd:enumeration value="ID"/>
<xsd:enumeration value="IDREF"/>
<xsd:enumeration value="IDREFS"/>
<xsd:enumeration value="int"/>
<xsd:enumeration value="integer"/>
<xsd:enumeration value="language"/>
<xsd:enumeration value="long"/>
<xsd:enumeration value="Name"/>
<xsd:enumeration value="NCName"/>
<xsd:enumeration value="negativeInteger"/>
<xsd:enumeration value="NMTOKEN"/>
<xsd:enumeration value="NMTOKENS"/>
<xsd:enumeration value="nonNegativeInteger"/>
<xsd:enumeration value="nonPositiveInteger"/>
<xsd:enumeration value="normalizedString"/>
<xsd:enumeration value="NOTATION"/>
<xsd:enumeration value="positiveInteger"/>
<xsd:enumeration value="QName"/>
<xsd:enumeration value="short"/>
<xsd:enumeration value="string"/>
<xsd:enumeration value="time"/>
<xsd:enumeration value="token"/>
<xsd:enumeration value="unsignedByte"/>
<xsd:enumeration value="unsignedInt"/>
<xsd:enumeration value="unsignedLong"/>
<xsd:enumeration value="unsignedShort"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="action">
```

```

<xsd:restriction base="xsd:string">
  <xsd:enumeration value="New"/>
  <xsd:enumeration value="Change"/>
  <xsd:enumeration value="Delete"/>
  <xsd:enumeration value="Replace"/>
  <xsd:enumeration value="Link"/>
  <xsd:enumeration value="Unlink"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="phaseCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="A"/>
    <xsd:enumeration value="B"/>
    <xsd:enumeration value="C"/>
    <xsd:enumeration value="N"/>
    <xsd:enumeration value="AB"/>
    <xsd:enumeration value="AC"/>
    <xsd:enumeration value="BC"/>
    <xsd:enumeration value="ABC"/>
    <xsd:enumeration value="AN"/>
    <xsd:enumeration value="BN"/>
    <xsd:enumeration value="CN"/>
    <xsd:enumeration value="ABN"/>
    <xsd:enumeration value="ACN"/>
    <xsd:enumeration value="BCN"/>
    <xsd:enumeration value="ABCN"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="outageEventType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Instantaneous"/>
    <xsd:enumeration value="Outage"/>
    <xsd:enumeration value="Restoration"/>
    <xsd:enumeration value="NoResponse"/>
    <xsd:enumeration value="Inferred"/>
    <xsd:enumeration value="PowerOn"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

    <xsd:enumeration value="PowerOff"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="outageDetectDeviceType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Call"/>
    <xsd:enumeration value="CustomerServiceRep"/>
    <xsd:enumeration value="InboundTelephoneDevice"/>
    <xsd:enumeration value="Meter"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="outageLocation" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="serviceLocationID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
        <xsd:element name="accountNumber" type="xsd:string" minOccurs="0"/>
        <xsd:element name="telephoneNumber" type="tns:telephoneNumber" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="telephoneNumber">
  <xsd:sequence>
    <xsd:element name="areaCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="cityCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="countryCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="localNumber" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extension" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

```

```

<xsd:complexType name="ArrayOfMessage">
  <xsd:sequence>
    <xsd:element name="message" type="tns:message" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="message" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="recordID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="eventTime" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="listenedOn" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="listenedBy" type="xsd:string" minOccurs="0"/>
        <xsd:element name="transcription" type="xsd:string" minOccurs="0"/>
        <xsd:element name="attachments" type="tns:ArrayOfAttachment" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ArrayOfAttachment">
  <xsd:sequence>
    <xsd:element name="attachment" type="tns:attachment" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="attachment" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:choice>
          <xsd:element name="contentReference" type="tns:contentReference" minOccurs="0"/>
          <xsd:element name="content" type="tns:content" minOccurs="0"/>
        </xsd:choice>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>

```

```

</xsd:complexType>
<xsd:complexType name="contentReference">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="URI" type="xsd:anyURI"/>
      <xsd:attribute name="name" type="xsd:string"/>
      <xsd:attribute name="category" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="content" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="contentBinary" type="xsd:base64Binary" minOccurs="0"/>
        <xsd:element name="contentEncoding" type="xsd:string" minOccurs="0"/>
        <xsd:element name="contentType" type="tns:contentType" minOccurs="0"/>
        <xsd:element name="fileName" type="xsd:string" minOccurs="0"/>
        <xsd:element name="sourceFilePath" type="xsd:string" minOccurs="0"/>
        <xsd:element name="attachDateTime" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="caption" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="contentType">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="type" type="tns:binaryType"/>
      <xsd:attribute name="subType" type="xsd:string"/>
      <xsd:attribute name="charset" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="binaryType">
  <xsd:restriction base="xsd:string">

```



```

    <xsd:enumeration value="text"/>
    <xsd:enumeration value="image"/>
    <xsd:enumeration value="audio"/>
    <xsd:enumeration value="video"/>
    <xsd:enumeration value="application"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="outageCustomer">
  <xsd:sequence>
    <xsd:element name="customerID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="callBackPhone" type="tns:telephoneNumber" minOccurs="0"/>
    <xsd:element name="timeToCall" type="tns:timeToCall" minOccurs="0"/>
    <xsd:element name="callBackFlag" type="xsd:boolean" minOccurs="0"/>
    <xsd:element name="callBackContactFirstName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="callBackContactLastName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="callBackContactMName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="callBackStatus" type="tns:callBackStatus" minOccurs="0"/>
    <xsd:element name="callBackCompletedTime" type="xsd:dateTime" minOccurs="0"/>
    <xsd:element name="callBackType" type="tns:callBackType" minOccurs="0"/>
    <xsd:element name="callRecordID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="outageEventID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="callerID" type="tns:telephoneNumber" minOccurs="0"/>
    <xsd:element name="serviceLocationID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="serviceID" type="tns:serviceID" minOccurs="0"/>
    <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="timeToCall">
  <xsd:sequence>
    <xsd:element name="startTime" type="xsd:dateTime" minOccurs="0"/>
    <xsd:element name="endTime" type="xsd:dateTime" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="callBackStatus">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="On"/>
    <xsd:enumeration value="Off"/>
  </xsd:restriction>

```

```

    <xsd:enumeration value="StillOff"/>
    <xsd:enumeration value="Undialable"/>
    <xsd:enumeration value="MaxDial"/>
    <xsd:enumeration value="NoResponse"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="callBackType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="IVR"/>
    <xsd:enumeration value="Manual"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="priorityType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Normal"/>
    <xsd:enumeration value="NeedsAttention"/>
    <xsd:enumeration value="Urgent"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="resolvedLevel">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Meter"/>
    <xsd:enumeration value="Address"/>
    <xsd:enumeration value="Unresolved"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="serviceID">
  <xsd:simpleContent>

```

```

<xsd:extension base="xsd:string">
  <xsd:attribute name="serviceType" type="tns:serviceType"/>
  <xsd:attribute name="objectID" type="xsd:string"/>
</xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:element name="ODEventNotificationResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="ODEventNotificationResult" type="tns:ArrayOfErrorObject"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xsd:schema>

```

4.5 OD_Server

4.5.1 WSDL

```

<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions targetNamespace="http://www.multispeak.org/Version_4.1_Release"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:s3="http://www.w3.org/1999/xlink"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release" xmlns:s1="cpsm_V4.1_Release"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:s2="gml_V4.1_Release"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.multispeak.org/Version_4.1_Release">

```

```
<s:include schemaLocation="OD_Server.xsd"/>
</s:schema>
  <s:schema elementFormDefault="qualified"
targetNamespace="cpsm_V4.1_Release">
  <s:include schemaLocation="../common/cpsm.xsd"/>
  </s:schema>
</wsdl:types>
<wsdl:message name="InitiateOutageDetectionEventRequestSoapIn">
  <wsdl:part name="parameters" element="tns:InitiateOutageDetectionEventRequest"/>
</wsdl:message>
<wsdl:message name="InitiateOutageDetectionEventRequestSoapOut">
  <wsdl:part name="parameters"
element="tns:InitiateOutageDetectionEventRequestResponse"/>
</wsdl:message>
<wsdl:message name="InitiateOutageDetectionEventRequestMultiSpeakMsgHeader">
  <wsdl:part name="MultiSpeakMsgHeader" element="tns:MultiSpeakMsgHeader"/>
</wsdl:message>
<wsdl:portType name="OD_ServerSoap">
  <wsdl:operation name="InitiateOutageDetectionEventRequest">
    <wsdl:documentation>Client
                                requests
                                server
                                to
                                update
                                the
                                status
                                of an
                                outageDetectionDevice.
                                OD
                                responds
                                by
                                publishing
                                a
                                revised
                                outageDetectionEvent
                                (using
```

the
ODEventNotification
method
on
OA-OD)
to the
URL
specified
in the
responseURL
parameter.
OD
returns
information
about
failed
transactions
using an
array of
errorObjects.
The
transactionID
calling
parameter
is
included
to link
a
returned
ODEventNotification
with
this
request.
The
expiration
time
parameter

indicates
the
amount
of time
for
which
the
publisher
should
try to
obtain
and
publish
the
data; if
the
publisher
has been
unsuccessful
in
publishing
the data
after
the
expiration
time,
then the
publisher
will
discard
the
request
and the
requestor
should
not

```

        expect a
        response.</wsdl:documentation>

        <wsdl:input message="tns:InitiateOutageDetectionEventRequestSoapIn"/>
        <wsdl:output message="tns:InitiateOutageDetectionEventRequestSoapOut"/>
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="OD_ServerSoap" type="tns:OD_ServerSoap">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <wsp:PolicyReference URI="#wss_username_token_service_policy" wsdl:required="false"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"/>
    <wsdl:operation name="InitiateOutageDetectionEventRequest">
        <soap:operation style="document"
soapAction="http://www.multispeak.org/Version_4.1_Release/InitiateOutageDetectionEventReq
uest"/>
        <wsdl:input>
            <soap:body use="literal"/>
            <soap:header message="tns:InitiateOutageDetectionEventRequestMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal"/>
            <soap:header message="tns:InitiateOutageDetectionEventRequestMultiSpeakMsgHeader"
part="MultiSpeakMsgHeader" use="literal"/>
        </wsdl:output>
    </wsdl:operation>
</wsdl:binding>
<wsdl:service name="OD_Server">
    <wsdl:port name="OD_ServerSoap_pt" binding="tns:OD_ServerSoap">
        <soap:address location="http://192.168.0.233:7004/soa-
infra/services/DG_Test/DGTestHarness/OD_Server"/>
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

4.5.2 XSD

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:tns="http://www.multispeak.org/Version_4.1_Release"
xmlns:cpsm="cpsm_V4.1_Release" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:include schemaLocation="../common/mspcommon.xsd"/>
  <xsd:element name="InitiateOutageDetectionEventRequest">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="meterIDs" type="tns:ArrayOfMeterIDNillable" minOccurs="0"/>
        <xsd:element name="requestDate" type="xsd:dateTime"/>
        <xsd:element name="responseURL" type="xsd:string" minOccurs="0"/>
        <xsd:element name="transactionID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="expTime" type="tns:expirationTime" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name="expirationTime">
    <xsd:simpleContent>
      <xsd:extension base="tns:time"/>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:complexType name="time">
    <xsd:simpleContent>
      <xsd:extension base="xsd:float">
        <xsd:attribute name="units" type="tns:timeUnits"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="timeUnits">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Milliseconds"/>
      <xsd:enumeration value="Seconds"/>
      <xsd:enumeration value="Minutes"/>
    </xsd:restriction>
  </xsd:simpleType>

```



```

    <xsd:enumeration value="Hours"/>
    <xsd:enumeration value="Days"/>
    <xsd:enumeration value="Weeks"/>
    <xsd:enumeration value="Months"/>
    <xsd:enumeration value="Years"/>
    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:element name="InitiateOutageDetectionEventRequestResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="InitiateOutageDetectionEventRequestResult"
type="tns:ArrayOfErrorObject" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xsd:schema>

```

4.6 Common XSD

4.6.1 Cpsm

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="cpsm_V4.1_Release" elementFormDefault="qualified"
attributeFormDefault="unqualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:cpsm="cpsm_V4.1_Release" xmlns:gml="gml_V4.1_Release">
  <xsd:import namespace="gml_V4.1_Release" schemaLocation="gml.xsd"/>
  <xsd:complexType name="IdentifiedObject" abstract="true">
    <xsd:sequence>
      <xsd:element name="mRID" type="xsd:string" minOccurs="0"/>
      <xsd:element name="description" type="xsd:string" minOccurs="0"/>
      <xsd:element name="Names" type="cpsm:ArrayOfName" minOccurs="0"/>
    </xsd:sequence>
    <xsd:anyAttribute/>
  </xsd:complexType>
  <xsd:complexType name="ArrayOfName">

```

```

<xsd:sequence>
  <xsd:element name="Name" type="cpsm:Name" minOccurs="0"
maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="Name">
  <xsd:sequence>
    <xsd:element name="nameString" type="xsd:string" minOccurs="0"/>
    <xsd:element name="description" type="xsd:string" minOccurs="0"/>
    <xsd:element name="NameType" type="cpsm:NameType" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="NameType">
  <xsd:sequence>
    <xsd:element name="nameString" type="xsd:string" minOccurs="0"/>
    <xsd:element name="description" type="xsd:string" minOccurs="0"/>
    <xsd:element name="NameTypeAuthority" type="cpsm:NameTypeAuthority"
minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="NameTypeAuthority">
  <xsd:sequence>
    <xsd:element name="nameString" type="xsd:string" minOccurs="0"/>
    <xsd:element name="description" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ConformLoadSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:SeasonDayTypeSchedule"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="SeasonDayTypeSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:RegularIntervalSchedule">
      <xsd:sequence>
        <xsd:element name="dayType" type="cpsm:DayType" minOccurs="0"/>

```

```

    <xsd:element name="seasonType" type="cpms:Season" minOccurs="0"/>
  </xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="RegularIntervalSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpms:BasicIntervalSchedule">
      <xsd:sequence>
        <xsd:element name="timeStep" type="cpms:Seconds" minOccurs="0"/>
        <xsd:element name="endTime" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="timePoints" type="cpms:TimePoints" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="BasicIntervalSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpms:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="startTime" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="value1Unit" type="xsd:string" minOccurs="0"/>
        <xsd:element name="value2Unit" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="mspCIMObject" abstract="true">
  <xsd:sequence>
    <xsd:element name="extensions" type="cpms:extensions" minOccurs="0"/>
    <xsd:element name="comments" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extensionsList" type="cpms:extensionsList" minOccurs="0"/>
    <xsd:element name="IdentifiedObject" type="cpms:IdentifiedObject" minOccurs="0"/>
  </xsd:sequence>
  <xsd:attribute name="objectID" type="xsd:string"/>
  <xsd:attribute name="verb" type="cpms:action" default="Change"/>
  <xsd:attribute name="errorString" type="xsd:string"/>

```

```

    <xsd:attribute name="replaceID" type="xsd:string"/>
    <xsd:attribute name="utility" type="xsd:string"/>
    <xsd:anyAttribute/>
  </xsd:complexType>
  <xsd:complexType name="extensions">
    <xsd:sequence>
      <xsd:any minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="extensionsList">
    <xsd:sequence>
      <xsd:element name="extensionsItem" type="cpdm:extensionsItem" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="extensionsItem">
    <xsd:sequence>
      <xsd:element name="extName" type="xsd:string" minOccurs="0"/>
      <xsd:element name="extValue" type="xsd:string" minOccurs="0"/>
      <xsd:element name="extType" minOccurs="0">
        <xsd:simpleType>
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="anySimpleType"/>
            <xsd:enumeration value="anyType"/>
            <xsd:enumeration value="anyURI"/>
            <xsd:enumeration value="base64Binary"/>
            <xsd:enumeration value="boolean"/>
            <xsd:enumeration value="byte"/>
            <xsd:enumeration value="date"/>
            <xsd:enumeration value="dateTime"/>
            <xsd:enumeration value="decimal"/>
            <xsd:enumeration value="double"/>
            <xsd:enumeration value="duration"/>
            <xsd:enumeration value="ENTITIES"/>
            <xsd:enumeration value="ENTITY"/>
            <xsd:enumeration value="float"/>

```

```
<xsd:enumeration value="gDay"/>
<xsd:enumeration value="gMonth"/>
<xsd:enumeration value="gMonthDay"/>
<xsd:enumeration value="gYear"/>
<xsd:enumeration value="gYearMonth"/>
<xsd:enumeration value="hexBinary"/>
<xsd:enumeration value="ID"/>
<xsd:enumeration value="IDREF"/>
<xsd:enumeration value="IDREFS"/>
<xsd:enumeration value="int"/>
<xsd:enumeration value="integer"/>
<xsd:enumeration value="language"/>
<xsd:enumeration value="long"/>
<xsd:enumeration value="Name"/>
<xsd:enumeration value="NCName"/>
<xsd:enumeration value="negativeInteger"/>
<xsd:enumeration value="NMTOKEN"/>
<xsd:enumeration value="NMTOKENS"/>
<xsd:enumeration value="nonNegativeInteger"/>
<xsd:enumeration value="nonPositiveInteger"/>
<xsd:enumeration value="normalizedString"/>
<xsd:enumeration value="NOTATION"/>
<xsd:enumeration value="positiveInteger"/>
<xsd:enumeration value="QName"/>
<xsd:enumeration value="short"/>
<xsd:enumeration value="string"/>
<xsd:enumeration value="time"/>
<xsd:enumeration value="token"/>
<xsd:enumeration value="unsignedByte"/>
<xsd:enumeration value="unsignedInt"/>
<xsd:enumeration value="unsignedLong"/>
<xsd:enumeration value="unsignedShort"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
</xsd:sequence>
</xsd:complexType>
```

```

<xsd:simpleType name="action">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="New"/>
    <xsd:enumeration value="Change"/>
    <xsd:enumeration value="Delete"/>
    <xsd:enumeration value="Replace"/>
    <xsd:enumeration value="Link"/>
    <xsd:enumeration value="Unlink"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="GeographicalRegion" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="SubGeographicalRegion" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="geographicalRegionID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="EquivalentNetwork" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="EquipmentContainer" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="contentsList" type="cpism:ContentsList" minOccurs="0"/>
        <xsd:element name="connectivityNodes" type="cpism:ConnectivityNodes"
minOccurs="0"/>

```

```

    <xsd:element name="connectivitySections" type="cpsm:ConnectivitySections"
minOccurs="0"/>
    </xsd:sequence>
    </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ContentsList">
    <xsd:sequence>
        <xsd:element name="contentsItem" type="cpsm:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="objectRef">
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="noun" type="xsd:QName"/>
    <xsd:attribute name="objectID" type="xsd:string"/>
    <xsd:attribute name="utility" type="xsd:string"/>
</xsd:complexType>
<xsd:complexType name="ConnectivityNodes">
    <xsd:sequence>
        <xsd:element name="NodeFields" type="cpsm:NodeFields" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="NodeFields">
    <xsd:sequence>
        <xsd:element name="connectivityNodeID" type="cpsm:nodeIdentifier" minOccurs="0"/>
        <xsd:element name="substationID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="measurements" type="cpsm:measurements" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="nodeIdentifier">
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="objectID" type="xsd:string"/>
</xsd:complexType>
<xsd:complexType name="measurements">
    <xsd:sequence>

```

```

    <xsd:element name="measurementID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ConnectivitySections">
  <xsd:sequence>
    <xsd:element name="sectionID" type="xsd:string" minOccurs="0"/>
    <xsd:element name="parentSectionID" type="cpsm:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="Line" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:EquipmentContainer">
      <xsd:sequence>
        <xsd:element name="regionID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Bay" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:EquipmentContainer">
      <xsd:sequence>
        <xsd:element name="voltageLevelID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="breakerConfiguration" type="cpsm:BreakerConfiguration"
minOccurs="0"/>
        <xsd:element name="busbarConfiguration" type="cpsm:BusbarConfiguration"
minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:simpleType name="BreakerConfiguration">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="singleBreaker"/>
  </xsd:restriction>
</xsd:simpleType>

```



```

    <xsd:enumeration value="breakerAndAHalf"/>
    <xsd:enumeration value="doubleBreaker"/>
    <xsd:enumeration value="noBreaker"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="BusbarConfiguration">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="singleBus"/>
    <xsd:enumeration value="doubleBus"/>
    <xsd:enumeration value="mainWithTransfer"/>
    <xsd:enumeration value="ringBus"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="VoltageLevel" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpdm:EquipmentContainer">
      <xsd:sequence>
        <xsd:element name="baseVoltageID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="highVoltageLimit" type="cpdm:voltage" minOccurs="0"/>
        <xsd:element name="lowVoltageLimit" type="cpdm:voltage" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="voltage">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpdm:voltageUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="voltageUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="V"/>
    <xsd:enumeration value="kV"/>
    <xsd:enumeration value="MV"/>
    <xsd:enumeration value="mV"/>
  </xsd:restriction>

```

```

    <xsd:enumeration value="microV"/>
    <xsd:enumeration value="Per Unit"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="ConductingEquipment" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="GMLLocation" type="gml:PointType" minOccurs="0"/>
        <xsd:element name="GMLLine" type="gml:LineStringType" minOccurs="0"/>
        <xsd:element name="connectivitySections" type="cpism:ConnectivitySections"
minOccurs="0"/>
        <xsd:element name="connectivityNodes" type="cpism:ConnectivityNodes"
minOccurs="0"/>
        <xsd:element name="phaseCode" type="cpism:phaseCode" minOccurs="0"/>
        <xsd:element name="normallyInService" type="xsd:boolean" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:simpleType name="phaseCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="A"/>
    <xsd:enumeration value="B"/>
    <xsd:enumeration value="C"/>
    <xsd:enumeration value="N"/>
    <xsd:enumeration value="AB"/>
    <xsd:enumeration value="AC"/>
    <xsd:enumeration value="BC"/>
    <xsd:enumeration value="ABC"/>
    <xsd:enumeration value="AN"/>
    <xsd:enumeration value="BN"/>
    <xsd:enumeration value="CN"/>
    <xsd:enumeration value="ABN"/>
    <xsd:enumeration value="ACN"/>
    <xsd:enumeration value="BCN"/>
  </xsd:restriction>

```

```

    <xsd:enumeration value="ABCN"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="TransformerWinding" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:ConductingEquipment">
      <xsd:sequence>
        <xsd:element name="tapChangers" type="cpsm:TapChangers" minOccurs="0"/>
        <xsd:element name="baseVoltageID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="windingNativeAttributes" type="cpsm:WindingNativeAttributes"
minOccurs="0"/>
        <xsd:element name="terminalList" type="cpsm:TerminalList" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="TapChangers">
  <xsd:sequence>
    <xsd:element name="TapChanger" type="cpsm:TapChanger" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="TapChanger" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:ConductingEquipment">
      <xsd:sequence>
        <xsd:element name="regulatingControl" type="cpsm:RegulatingControl"
minOccurs="0"/>
        <xsd:element name="voltageBandwidth" type="cpsm:voltage" minOccurs="0"/>
        <xsd:element name="numberOfSteps" type="xsd:integer" minOccurs="0"/>
        <xsd:element name="ptRatio" type="xsd:double" minOccurs="0"/>
        <xsd:element name="ctRating" type="cpsm:current" minOccurs="0"/>
        <xsd:element name="ampacity" type="cpsm:current" minOccurs="0"/>
        <xsd:element name="initialDelay" type="cpsm:Seconds" minOccurs="0"/>
        <xsd:element name="subsequentDelay" type="cpsm:Seconds" minOccurs="0"/>
        <xsd:element name="nativeAttributes" type="cpsm:TapChangerNativeAttributes"

```

```

minOccurs="0"/>
    <xsd:element name="terminalID" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="RegulatingControl" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="terminalID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="regulationSchedule" type="cpsm:RegulationSchedule"
minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="RegulationSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:RegularIntervalSchedule">
      <xsd:sequence>
        <xsd:element name="lineDropCompensation" type="xsd:boolean" minOccurs="0"/>
        <xsd:element name="lineDropR" type="cpsm:resistance" minOccurs="0"/>
        <xsd:element name="lineDropX" type="cpsm:reactance" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="resistance">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:zUnit"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="zUnit">

```

```

<xsd:restriction base="xsd:string">
  <xsd:enumeration value="Ohms"/>
  <xsd:enumeration value="Percent"/>
  <xsd:enumeration value="Per Unit"/>
  <xsd:enumeration value="Total"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="reactance">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:zUnit"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="current">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:currentUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="currentUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="A"/>
    <xsd:enumeration value="mA"/>
    <xsd:enumeration value="kA"/>
    <xsd:enumeration value="MA"/>
    <xsd:enumeration value="Per Unit"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="Seconds">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="unit" type="cpsm:UnitSymbol"/>
      <xsd:attribute name="multiplier" type="cpsm:UnitMultiplier"/>
      <xsd:anyAttribute/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

```

```

</xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="UnitSymbol">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="VA"/>
    <xsd:enumeration value="W"/>
    <xsd:enumeration value="VAr"/>
    <xsd:enumeration value="VAh"/>
    <xsd:enumeration value="Wh"/>
    <xsd:enumeration value="VArh"/>
    <xsd:enumeration value="V"/>
    <xsd:enumeration value="ohm"/>
    <xsd:enumeration value="A"/>
    <xsd:enumeration value="F"/>
    <xsd:enumeration value="H"/>
    <xsd:enumeration value="C"/>
    <xsd:enumeration value="s"/>
    <xsd:enumeration value="min"/>
    <xsd:enumeration value="h"/>
    <xsd:enumeration value="deg"/>
    <xsd:enumeration value="rad"/>
    <xsd:enumeration value="J"/>
    <xsd:enumeration value="N"/>
    <xsd:enumeration value="S"/>
    <xsd:enumeration value="none"/>
    <xsd:enumeration value="Hz"/>
    <xsd:enumeration value="kg"/>
    <xsd:enumeration value="Pa"/>
    <xsd:enumeration value="m"/>
    <xsd:enumeration value="m2"/>
    <xsd:enumeration value="m3"/>
    <xsd:enumeration value="V/VAr"/>
    <xsd:enumeration value="W/Hz"/>
    <xsd:enumeration value="J/s"/>
    <xsd:enumeration value="s-1"/>
    <xsd:enumeration value="kg/J"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

    <xsd:enumeration value="W/s"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="UnitMultiplier">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="p"/>
    <xsd:enumeration value="n"/>
    <xsd:enumeration value="micro"/>
    <xsd:enumeration value="m"/>
    <xsd:enumeration value="c"/>
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="k"/>
    <xsd:enumeration value="M"/>
    <xsd:enumeration value="G"/>
    <xsd:enumeration value="T"/>
    <xsd:enumeration value="none"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="TapChangerNativeAttributes">
  <xsd:sequence>
    <xsd:element name="highStep" type="xsd:integer" minOccurs="0"/>
    <xsd:element name="lowStep" type="xsd:integer" minOccurs="0"/>
    <xsd:element name="neutralU" type="cpsm:voltage" minOccurs="0"/>
    <xsd:element name="neutralStep" type="xsd:integer" minOccurs="0"/>
    <xsd:element name="normalStep" type="xsd:integer" minOccurs="0"/>
    <xsd:element name="stepPhaseShiftIncrement" type="cpsm:angle" minOccurs="0"/>
    <xsd:element name="stepVoltageIncrement" type="cpsm:PerCent" minOccurs="0"/>
    <xsd:element name="type" type="cpsm:TapChangerKind" minOccurs="0"/>
    <xsd:element name="tcuControlMode" type="cpsm:TransformerControlMode"
minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="angle">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:angleUnits"/>
    </xsd:extension>
  </xsd:simpleContent>

```

```

</xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="angleUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Degrees"/>
    <xsd:enumeration value="Minutes"/>
    <xsd:enumeration value="Seconds"/>
    <xsd:enumeration value="Radians"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="PerCent">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="TapChangerKind">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="fixed"/>
    <xsd:enumeration value="voltageControl"/>
    <xsd:enumeration value="phaseControl"/>
    <xsd:enumeration value="voltageAndPhaseControl"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="TransformerControlMode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="off"/>
    <xsd:enumeration value="local"/>
    <xsd:enumeration value="volt"/>
    <xsd:enumeration value="active"/>
    <xsd:enumeration value="reactive"/>
  </xsd:restriction>
</xsd:simpleType>

```



```

<xsd:complexType name="WindingNativeAttributes">
  <xsd:sequence>
    <xsd:element name="ratedU" type="cpsm:voltage" minOccurs="0"/>
    <xsd:element name="ratedS" type="cpsm:apparentPower" minOccurs="0"/>
    <xsd:element name="windingType" type="cpsm:WindingType" minOccurs="0"/>
    <xsd:element name="b" type="cpsm:susceptance" minOccurs="0"/>
    <xsd:element name="r" type="cpsm:resistance" minOccurs="0"/>
    <xsd:element name="x" type="cpsm:reactance" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="apparentPower">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:apparentPowerUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="apparentPowerUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="VA"/>
    <xsd:enumeration value="kVA"/>
    <xsd:enumeration value="MVA"/>
    <xsd:enumeration value="Per Unit"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="WindingType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Primary"/>
    <xsd:enumeration value="Secondary"/>
    <xsd:enumeration value="Tertiary"/>
    <xsd:enumeration value="Quaternary"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="susceptance">
  <xsd:simpleContent>

```

```

    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:sUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="sUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="microS"/>
    <xsd:enumeration value="mS"/>
    <xsd:enumeration value="S"/>
    <xsd:enumeration value="kS"/>
    <xsd:enumeration value="MS"/>
    <xsd:enumeration value="Siemens"/>
    <xsd:enumeration value="mho"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="TerminalList">
  <xsd:sequence>
    <xsd:element name="terminalID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="Connector" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:ConductingEquipment"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="BusbarSection" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:Connector">
      <xsd:sequence>
        <xsd:element name="busbarType" type="xsd:string" minOccurs="0"/>
        <xsd:element name="equipmentContainerID" type="cpsm:objectRef" minOccurs="0"/>
        <xsd:element name="bayID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>

```

```

</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="EquivalentEquipment" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:ConductingEquipment"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="EquivalentShunt" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:EquivalentEquipment">
      <xsd:sequence>
        <xsd:element name="g" type="cpsm:conductance" minOccurs="0"/>
        <xsd:element name="b" type="cpsm:susceptance" minOccurs="0"/>
        <xsd:element name="equivalentNetworkID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="conductance">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpsm:sUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="EquivalentBranch" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:EquivalentEquipment">
      <xsd:sequence>
        <xsd:element name="r" type="cpsm:resistance" minOccurs="0"/>
        <xsd:element name="x" type="cpsm:reactance" minOccurs="0"/>
        <xsd:element name="equivalentNetworkID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Terminal" mixed="false">

```

```

<xsd:complexContent mixed="false">
  <xsd:extension base="cpism:ConductingEquipment">
    <xsd:sequence>
      <xsd:element name="measurements" type="cpism:measurements" minOccurs="0"/>
    </xsd:sequence>
  </xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="GeneratingUnit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:ConductingEquipment">
      <xsd:sequence>
        <xsd:element name="equipmentContainerID" type="cpism:objectRef" minOccurs="0"/>
        <xsd:element name="GrossToNetActivePowerCurve"
type="cpism:GrossToNetActivePowerCurve" minOccurs="0"/>
        <xsd:element name="ReactiveCapabilityCurve" type="cpism:ReactiveCapabilityCurve"
minOccurs="0"/>
        <xsd:element name="efficiency" type="xsd:float" minOccurs="0"/>
        <xsd:element name="initialP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="longPF" type="xsd:float" minOccurs="0"/>
        <xsd:element name="maxOperatingP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="minOperatingP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="normalPF" type="xsd:float" minOccurs="0"/>
        <xsd:element name="genControlSource" type="cpism:GeneratorControlSource"
minOccurs="0"/>
        <xsd:element name="ratedGrossMaxP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="ratedGrossMinP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="ratedNetMaxP" type="cpism:activePower" minOccurs="0"/>
        <xsd:element name="shortPF" type="xsd:float" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="GrossToNetActivePowerCurve" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:Curve"/>
  </xsd:complexContent>
</xsd:complexType>

```

```

    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="Curve" mixed="false">
    <xsd:complexContent mixed="false">
      <xsd:extension base="cpism:mspCIMObject">
        <xsd:sequence>
          <xsd:element name="curveStyle" type="cpism:CurveStyle" minOccurs="0"/>
          <xsd:element name="xUnit" type="xsd:string" minOccurs="0"/>
          <xsd:element name="y1Unit" type="xsd:string" minOccurs="0"/>
          <xsd:element name="y2Unit" type="xsd:string" minOccurs="0"/>
          <xsd:element name="dataPoints" type="cpism:DataPoints" minOccurs="0"/>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:simpleType name="CurveStyle">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="constantYValue"/>
      <xsd:enumeration value="straightLineYValues"/>
      <xsd:enumeration value="rampYValues"/>
      <xsd:enumeration value="formula"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="DataPoints">
    <xsd:sequence>
      <xsd:element name="curveData" type="cpism:CurveData" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CurveData">
    <xsd:sequence>
      <xsd:element name="xvalue" type="xsd:float" minOccurs="0"/>
      <xsd:element name="y1value" type="xsd:float" minOccurs="0"/>
      <xsd:element name="y2value" type="xsd:float" minOccurs="0"/>
    </xsd:sequence>
    <xsd:anyAttribute/>
  </xsd:complexType>

```

```

<xsd:complexType name="ReactiveCapabilityCurve" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:Curve"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="activePower">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="units" type="cpism:realPowerUnits"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:simpleType name="realPowerUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="mW"/>
    <xsd:enumeration value="W"/>
    <xsd:enumeration value="kW"/>
    <xsd:enumeration value="MW"/>
    <xsd:enumeration value="GW"/>
    <xsd:enumeration value="Per Unit"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="GeneratorControlSource">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Unavailable"/>
    <xsd:enumeration value="offAGC"/>
    <xsd:enumeration value="onAGC"/>
    <xsd:enumeration value="PlantControl"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="ThermalGeneratingUnit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:GeneratingUnit"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="HydroGeneratingUnit" mixed="false">

```

```

<xsd:complexContent mixed="false">
  <xsd:extension base="cpm:GeneratingUnit"/>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="RegulatingCondEq" abstract="true" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpm:ConductingEquipment">
      <xsd:sequence>
        <xsd:element name="equipmentContainerID" type="cpm:objectRef" minOccurs="0"/>
        <xsd:element name="regulatingControlID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="StaticVarCompensator" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpm:RegulatingCondEq">
      <xsd:sequence>
        <xsd:element name="capacitiveRating" type="cpm:reactivePower" minOccurs="0"/>
        <xsd:element name="inductiveRating" type="cpm:reactivePower" minOccurs="0"/>
        <xsd:element name="sVCControlMode" minOccurs="0">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="ReactivePower"/>
              <xsd:enumeration value="Voltage"/>
              <xsd:enumeration value="Off"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:element>
        <xsd:element name="slope" minOccurs="0">
          <xsd:complexType>
            <xsd:simpleContent>
              <xsd:extension base="xsd:float">
                <xsd:attribute name="units">
                  <xsd:simpleType>
                    <xsd:restriction base="xsd:string">
                      <xsd:enumeration value="kV/MVAr"/>

```

```

        </xsd:restriction>
        </xsd:simpleType>
        </xsd:attribute>
        </xsd:extension>
        </xsd:simpleContent>
        </xsd:complexType>
        </xsd:element>
        <xsd:element name="voltageSetPoint" type="cpism:voltage" minOccurs="0"/>
        </xsd:sequence>
        </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
    <xsd:complexType name="reactivePower">
        <xsd:simpleContent>
            <xsd:extension base="xsd:float">
                <xsd:attribute name="units" type="cpism:reactivePowerUnits"/>
            </xsd:extension>
        </xsd:simpleContent>
    </xsd:complexType>
    <xsd:simpleType name="reactivePowerUnits">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="mVAr"/>
            <xsd:enumeration value="VAr"/>
            <xsd:enumeration value="kVAr"/>
            <xsd:enumeration value="MVAr"/>
            <xsd:enumeration value="GVAr"/>
            <xsd:enumeration value="Per Unit"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:complexType name="PowerSystemResource" abstract="true" mixed="false">
        <xsd:complexContent mixed="false">
            <xsd:extension base="cpism:mspCIMObject"/>
        </xsd:complexContent>
    </xsd:complexType>
    <xsd:complexType name="LoadArea" mixed="false">
        <xsd:complexContent mixed="false">

```



```

    <xsd:extension base="cpsm:PowerSystemResource"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="BaseVoltage" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="nominalVoltage" type="cpsm:voltage" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Unit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ConnectivityNode" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="voltageLevelID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="subControlAreaID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="nominalVoltage" type="xsd:string" minOccurs="0"/>
        <xsd:element name="substationID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="measurementList" type="cpsm:measurements" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Accumulator" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="maxValue" type="xsd:positiveInteger" minOccurs="0"/>
        <xsd:element name="accumulatorValues" type="cpsm:AccumulatorValues"
minOccurs="0"/>

```

```

<xsd:element name="units" type="cpsm:uom" minOccurs="0"/>
<xsd:element name="unitID" type="xsd:string" minOccurs="0"/>
<xsd:element name="quality" type="cpsm:qualityDescription" minOccurs="0"/>
<xsd:element name="timeSpan" minOccurs="0">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="startTime" type="xsd:dateTime"/>
      <xsd:element name="stopTime" type="xsd:dateTime"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="phase" type="cpsm:phaseCode" minOccurs="0"/>
<xsd:element name="harmonic" type="xsd:integer" minOccurs="0"/>
<xsd:element name="quadrant" type="cpsm:accountability" minOccurs="0"/>
<xsd:element name="measurementTypeID" type="xsd:string" minOccurs="0"/>
<xsd:element name="terminalID" type="xsd:string" minOccurs="0"/>
<xsd:element name="powerSystemResourceID" type="cpsm:objectRef" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="AccumulatorValues">
  <xsd:sequence>
    <xsd:element name="AccumulatorValue" type="cpsm:AccumulatorValue" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="AccumulatorValue" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:MeasurementValue">
      <xsd:sequence>
        <xsd:element name="value" type="xsd:positiveInteger" minOccurs="0"/>
        <xsd:element name="measurementValueSourceID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>

```

```

</xsd:complexType>
<xsd:complexType name="MeasurementValue" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="timeStamp" type="xsd:dateTime" minOccurs="0"/>
        <xsd:element name="sensorAccuracy" type="cpism:PerCent" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="DiscreteValue" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:MeasurementValue">
      <xsd:sequence>
        <xsd:element name="value" type="xsd:integer" minOccurs="0"/>
        <xsd:element name="measurementValueSourceID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="AnalogValue" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:MeasurementValue">
      <xsd:sequence>
        <xsd:element name="value" type="xsd:positiveInteger" minOccurs="0"/>
        <xsd:element name="measurementValueSourceID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="StringMeasurementValue" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:MeasurementValue">
      <xsd:sequence>
        <xsd:element name="value" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

```

```

</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:simpleType name="uom">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Wh"/>
    <xsd:enumeration value="W"/>
    <xsd:enumeration value="kWh"/>
    <xsd:enumeration value="kW"/>
    <xsd:enumeration value="MWh"/>
    <xsd:enumeration value="MW"/>
    <xsd:enumeration value="GWh"/>
    <xsd:enumeration value="GW"/>
    <xsd:enumeration value="mWh"/>
    <xsd:enumeration value="mW"/>
    <xsd:enumeration value="microWh"/>
    <xsd:enumeration value="microW"/>
    <xsd:enumeration value="VARh"/>
    <xsd:enumeration value="VAR"/>
    <xsd:enumeration value="kVARh"/>
    <xsd:enumeration value="kVAR"/>
    <xsd:enumeration value="MVARh"/>
    <xsd:enumeration value="MVAR"/>
    <xsd:enumeration value="GVARh"/>
    <xsd:enumeration value="GVAR"/>
    <xsd:enumeration value="mVARh"/>
    <xsd:enumeration value="mVAR"/>
    <xsd:enumeration value="microVARh"/>
    <xsd:enumeration value="microVAR"/>
    <xsd:enumeration value="VAh"/>
    <xsd:enumeration value="VA"/>
    <xsd:enumeration value="kVAh"/>
    <xsd:enumeration value="kVA"/>
    <xsd:enumeration value="MVAh"/>
    <xsd:enumeration value="MVA"/>
    <xsd:enumeration value="GVAh"/>

```

```

<xsd:enumeration value="GVA"/>
<xsd:enumeration value="mVAh"/>
<xsd:enumeration value="mVA"/>
<xsd:enumeration value="microVAh"/>
<xsd:enumeration value="microVA"/>
<xsd:enumeration value="Qh"/>
<xsd:enumeration value="Q"/>
<xsd:enumeration value="kQh"/>
<xsd:enumeration value="kQ"/>
<xsd:enumeration value="MQh"/>
<xsd:enumeration value="MQ"/>
<xsd:enumeration value="GQh"/>
<xsd:enumeration value="GQ"/>
<xsd:enumeration value="mQh"/>
<xsd:enumeration value="mQ"/>
<xsd:enumeration value="microQh"/>
<xsd:enumeration value="microQ"/>
<xsd:enumeration value="V RMS"/>
<xsd:enumeration value="kV RMS"/>
<xsd:enumeration value="MV RMS"/>
<xsd:enumeration value="mV RMS"/>
<xsd:enumeration value="microV RMS"/>
<xsd:enumeration value="V"/>
<xsd:enumeration value="kV"/>
<xsd:enumeration value="MV"/>
<xsd:enumeration value="mV"/>
<xsd:enumeration value="microV"/>
<xsd:enumeration value="Vsquared RMS"/>
<xsd:enumeration value="kVsquared RMS"/>
<xsd:enumeration value="MV squared RMS"/>
<xsd:enumeration value="mVsquared RMS"/>
<xsd:enumeration value="microVsquared RMS"/>
<xsd:enumeration value="Amps RMS"/>
<xsd:enumeration value="kAmps RMS"/>
<xsd:enumeration value="MAmps RMS"/>
<xsd:enumeration value="mAmps RMS"/>
<xsd:enumeration value="microAmps RMS"/>

```

```

<xsd:enumeration value="Amps"/>
<xsd:enumeration value="kAmps"/>
<xsd:enumeration value="MAmps"/>
<xsd:enumeration value="mAmps"/>
<xsd:enumeration value="microAmps"/>
<xsd:enumeration value="Amps squared RMS"/>
<xsd:enumeration value="kAmps squared RMS"/>
<xsd:enumeration value="MAmps squared RMS"/>
<xsd:enumeration value="mAmps squared RMS"/>
<xsd:enumeration value="microAmps squared RMS"/>
<xsd:enumeration value="T.H.D. Voltage"/>
<xsd:enumeration value="T.H.D. Current"/>
<xsd:enumeration value="Voltage phase angle"/>
<xsd:enumeration value="Current phase angle"/>
<xsd:enumeration value="Power factor"/>
<xsd:enumeration value="Time"/>
<xsd:enumeration value="Date"/>
<xsd:enumeration value="Date time"/>
<xsd:enumeration value="Interval timer"/>
<xsd:enumeration value="Frequency"/>
<xsd:enumeration value="Counter"/>
<xsd:enumeration value="Sense input"/>
<xsd:enumeration value="Nbr of pulse"/>
<xsd:enumeration value="Nbr of sag"/>
<xsd:enumeration value="Nbr of swells"/>
<xsd:enumeration value="Nbr of power outage"/>
<xsd:enumeration value="Nbr of excursion low"/>
<xsd:enumeration value="Nbr of excursion high"/>
<xsd:enumeration value="Normal voltage period"/>
<xsd:enumeration value="Nbr of voltage unbalance"/>
<xsd:enumeration value="Nbr of V T.H.D. excess"/>
<xsd:enumeration value="Nbr of amps T.H.D. excess"/>
<xsd:enumeration value="Nbr of demand resets"/>
<xsd:enumeration value="Nbr of times programmed"/>
<xsd:enumeration value="Minutes on battery"/>
<xsd:enumeration value="Nbr of inversion"/>

```

```

<xsd:enumeration value="Nbr of removal"/>
<xsd:enumeration value="Nbr of reprogramming"/>
<xsd:enumeration value="Nbr of power loss"/>
<xsd:enumeration value="Nbr of reverse rotation"/>
<xsd:enumeration value="Nbr of physical tamper"/>
<xsd:enumeration value="Nbr of encoder tamper"/>
<xsd:enumeration value="Nbr of watchdog"/>
<xsd:enumeration value="cubic meters uncorrected"/>
<xsd:enumeration value="cubic meters per Hr uncorrected"/>
<xsd:enumeration value="cubic meters corrected"/>
<xsd:enumeration value="cubic meters per Hr corrected"/>
<xsd:enumeration value="cubic feet uncorrected"/>
<xsd:enumeration value="cubic feet per Hr uncorrected"/>
<xsd:enumeration value="cubic feet corrected"/>
<xsd:enumeration value="cubic feet per Hr corrected"/>
<xsd:enumeration value="deg C"/>
<xsd:enumeration value="deg F"/>
<xsd:enumeration value="deg K"/>
<xsd:enumeration value="Joules"/>
<xsd:enumeration value="Joules per Hr"/>
<xsd:enumeration value="kJoules"/>
<xsd:enumeration value="kJoules per Hr"/>
<xsd:enumeration value="MJoules"/>
<xsd:enumeration value="MJoules per Hr"/>
<xsd:enumeration value="mJoules"/>
<xsd:enumeration value="mJoules per Hr"/>
<xsd:enumeration value="microJoules"/>
<xsd:enumeration value="microJoules per Hr"/>
<xsd:enumeration value="Therm"/>
<xsd:enumeration value="Therm per Hr"/>
<xsd:enumeration value="Static pascal"/>
<xsd:enumeration value="Differential pascal"/>
<xsd:enumeration value="Static pound per square inch"/>
<xsd:enumeration value="Differential pound per square inch"/>
<xsd:enumeration value="Gram square cm"/>
<xsd:enumeration value="Meter HG column"/>
<xsd:enumeration value="Inches HG column"/>

```

```
<xsd:enumeration value="Inches H2O column"/>
<xsd:enumeration value="Bar"/>
<xsd:enumeration value="percent relative humidity"/>
<xsd:enumeration value="PPM odorant"/>
<xsd:enumeration value="cubic meter"/>
<xsd:enumeration value="cubic meter per Hr"/>
<xsd:enumeration value="cubic feet"/>
<xsd:enumeration value="cubic feet per Hr"/>
<xsd:enumeration value="ccf"/>
<xsd:enumeration value="ccf per Hr"/>
<xsd:enumeration value="US gl"/>
<xsd:enumeration value="US gl per Hr"/>
<xsd:enumeration value="IMP gl"/>
<xsd:enumeration value="IMP gl per Hr"/>
<xsd:enumeration value="Acre ft"/>
<xsd:enumeration value="PPM lead"/>
<xsd:enumeration value="turbidity"/>
<xsd:enumeration value="PPM chlorine"/>
<xsd:enumeration value="PH factor"/>
<xsd:enumeration value="Corrosion"/>
<xsd:enumeration value="Ionization"/>
<xsd:enumeration value="PPM SO2"/>
<xsd:enumeration value="liters"/>
<xsd:enumeration value="pounds per square foot"/>
<xsd:enumeration value="inches of water"/>
<xsd:enumeration value="ft of water"/>
<xsd:enumeration value="atmospheres"/>
<xsd:enumeration value="Dollar"/>
<xsd:enumeration value="inches"/>
<xsd:enumeration value="ft"/>
<xsd:enumeration value="m"/>
<xsd:enumeration value="dm"/>
<xsd:enumeration value="km"/>
<xsd:enumeration value="cm"/>
<xsd:enumeration value="mm"/>
<xsd:enumeration value="micro m"/>
```



```

    <xsd:enumeration value="mph"/>
    <xsd:enumeration value="feet per second"/>
    <xsd:enumeration value="km per hour"/>
    <xsd:enumeration value="km per second"/>
    <xsd:enumeration value="m per second"/>
    <xsd:enumeration value="percent"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="qualityDescription">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Measured"/>
    <xsd:enumeration value="Default"/>
    <xsd:enumeration value="Estimated"/>
    <xsd:enumeration value="Calculated"/>
    <xsd:enumeration value="Initial"/>
    <xsd:enumeration value="Last"/>
    <xsd:enumeration value="Failed"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="accountability">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Q1"/>
    <xsd:enumeration value="Q2"/>
    <xsd:enumeration value="Q3"/>
    <xsd:enumeration value="Q4"/>
    <xsd:enumeration value="Q1-2"/>
    <xsd:enumeration value="Q1-3"/>
    <xsd:enumeration value="Q1-4"/>
    <xsd:enumeration value="Q2-3"/>
    <xsd:enumeration value="Q2-4"/>
    <xsd:enumeration value="Q3-4"/>
    <xsd:enumeration value="Q1-2-3"/>
    <xsd:enumeration value="Q1-2-4"/>
    <xsd:enumeration value="Q1-3-4"/>
    <xsd:enumeration value="Q2-3-4"/>
    <xsd:enumeration value="Q1-2-3-4"/>
    <xsd:enumeration value="Q1-2-netFlow"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

    <xsd:enumeration value="Q1-3-netFlow"/>
    <xsd:enumeration value="Q1-4-netFlow"/>
    <xsd:enumeration value="Q2-3-netFlow"/>
    <xsd:enumeration value="Q2-4-netFlow"/>
    <xsd:enumeration value="Q3-4-netFlow"/>
    <xsd:enumeration value="Q1-2-3-netFlow"/>
    <xsd:enumeration value="Q1-2-4-netFlow"/>
    <xsd:enumeration value="Q1-3-4-netFlow"/>
    <xsd:enumeration value="Q2-3-4-netFlow"/>
    <xsd:enumeration value="Q1-2-3-4-netFlow"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="StringMeasurement" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="stringMeasurementValue" type="cpism:StringMeasurementValue"
minOccurs="0"/>
        <xsd:element name="measurementTypeID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="measurementValueSourceID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="MeasurementType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="MeasurementValueSource" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="SubLoadArea" mixed="false">
  <xsd:complexContent mixed="false">

```

```

    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="loadAreaID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ConformLoadGroup" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="subLoadAreaID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="conformLoadSchedule" type="cpism:ConformLoadSchedule"
minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="NonConformLoadGroup" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="subLoadAreaID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="nonConformLoadSchedule"
type="cpism:NonConformLoadSchedule" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="NonConformLoadSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:SeasonDayTypeSchedule"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ControlArea" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:mspCIMObject">

```

```

<xsd:sequence>
  <xsd:element name="netInterchange" type="cpsm:activePower" minOccurs="0"/>
  <xsd:element name="tieFlow" minOccurs="0">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="positiveFlowIn" type="xsd:boolean" minOccurs="0"/>
        <xsd:element name="terminalID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="type" minOccurs="0">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="AGC"/>
        <xsd:enumeration value="Forecast"/>
        <xsd:enumeration value="Interchange"/>
        <xsd:enumeration value="Other"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:element>
  <xsd:element name="EnergyAreaID" type="xsd:string" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ControlAreaGeneratingUnit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="controlAreaID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="generatingUnitID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ActivePowerLimit" mixed="false">

```

```

<xsd:complexContent mixed="false">
  <xsd:extension base="cpsm:mspCIMObject">
    <xsd:sequence>
      <xsd:element name="value" type="cpsm:activePower" minOccurs="0"/>
      <xsd:element name="type" type="xsd:string" minOccurs="0"/>
      <xsd:element name="operationalLimitSetID" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ApparentPowerLimit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="value" type="cpsm:activePower" minOccurs="0"/>
        <xsd:element name="type" type="xsd:string" minOccurs="0"/>
        <xsd:element name="operationalLimitSetID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="CurrentLimit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="value" type="cpsm:activePower" minOccurs="0"/>
        <xsd:element name="type" type="xsd:string" minOccurs="0"/>
        <xsd:element name="operationalLimitSetID" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="VoltageLimit" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="value" type="cpsm:activePower" minOccurs="0"/>

```

```

    <xsd:element name="type" type="xsd:string" minOccurs="0"/>
    <xsd:element name="operationalLimitSetID" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="OperationalLimitSet" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="equipmentID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="limits" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="limitID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="DayType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Discrete" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:mspCIMObject">
      <xsd:sequence>
        <xsd:element name="maxValue" type="xsd:integer" minOccurs="0"/>
        <xsd:element name="minValue" type="xsd:integer" minOccurs="0"/>
        <xsd:element name="normalValue" type="xsd:integer" minOccurs="0"/>
        <xsd:element name="discreteValue" type="cpsm:DiscreteValue" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

```

```

<xsd:element name="units" type="cpism:uom" minOccurs="0"/>
<xsd:element name="unitID" type="xsd:string" minOccurs="0"/>
<xsd:element name="quality" type="cpism:qualityDescription" minOccurs="0"/>
<xsd:element name="phase" type="cpism:phaseCode" minOccurs="0"/>
<xsd:element name="unitPrefix" type="cpism:unitPrefix" minOccurs="0"/>
<xsd:element name="harmonic" type="xsd:integer" minOccurs="0"/>
<xsd:element name="quadrant" type="cpism:accountability" minOccurs="0"/>
<xsd:element name="measurementTypeID" type="xsd:string" minOccurs="0"/>
<xsd:element name="terminalID" type="xsd:string" minOccurs="0"/>
<xsd:element name="powerSystemResourceID" type="cpism:objectRef" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:simpleType name="unitPrefix">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Maximum"/>
    <xsd:enumeration value="Minimum"/>
    <xsd:enumeration value="Average"/>
    <xsd:enumeration value="Instantaneous"/>
    <xsd:enumeration value="Cumulative"/>
    <xsd:enumeration value="Quantity"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="IrregularIntervalSchedule" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpism:BasicIntervalSchedule">
      <xsd:sequence>
        <xsd:element name="TimePoints" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="IrregularTimePoint" type="cpism:IrregularTimePoint"
minOccurs="0" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

```

```

    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="IrregularTimePoint">
  <xsd:sequence>
    <xsd:element name="time" type="cpsm:Seconds" minOccurs="0"/>
    <xsd:element name="value1" type="xsd:float" minOccurs="0"/>
    <xsd:element name="value2" type="xsd:float" minOccurs="0"/>
  </xsd:sequence>
  <xsd:anyAttribute/>
</xsd:complexType>
<xsd:complexType name="TimePoints">
  <xsd:sequence>
    <xsd:element name="timePoint" type="cpsm:RegularTimePoint" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="RegularTimePoint">
  <xsd:sequence>
    <xsd:element name="sequenceNumber" type="xsd:integer" minOccurs="0"/>
    <xsd:element name="value1" type="xsd:float" minOccurs="0"/>
    <xsd:element name="value2" type="xsd:float" minOccurs="0"/>
  </xsd:sequence>
  <xsd:anyAttribute/>
</xsd:complexType>
<xsd:complexType name="LoadCurve" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="cpsm:RegularIntervalSchedule">
      <xsd:sequence>
        <xsd:element name="subLoadAreaID" type="xsd:string" minOccurs="0"/>
        <xsd:element name="season" type="cpsm:Season" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="Season">

```



```

<xsd:sequence>
  <xsd:element name="name" type="cpms:SeasonName" minOccurs="0"/>
  <xsd:element name="endDate" type="xsd:dateTime" minOccurs="0"/>
  <xsd:element name="startDate" type="xsd:dateTime" minOccurs="0"/>
</xsd:sequence>
<xsd:anyAttribute/>
</xsd:complexType>
<xsd:simpleType name="SeasonName">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="winter"/>
    <xsd:enumeration value="spring"/>
    <xsd:enumeration value="summer"/>
    <xsd:enumeration value="fall"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="SynchronousMachineType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="generator"/>
    <xsd:enumeration value="condenser"/>
    <xsd:enumeration value="generator_or_condenser"/>
    <xsd:enumeration value="motor"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="SynchronousMachineOperatingMode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="generator"/>
    <xsd:enumeration value="condenser"/>
    <xsd:enumeration value="motor"/>
  </xsd:restriction>
</xsd:simpleType>
</xsd:schema>

```

4.6.2 Gml

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="gml_V4.1_Release" elementFormDefault="qualified"

```

```

attributeFormDefault="unqualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gml="gml_V4.1_Release">
  <xsd:import namespace="http://www.w3.org/1999/xlink" schemaLocation="xlink.xsd"/>
  <xsd:complexType name="PointType" mixed="false">
    <xsd:complexContent mixed="false">
      <xsd:extension base="gml:AbstractGeometryType">
        <xsd:sequence>
          <xsd:choice>
            <xsd:element name="coord" type="gml:CoordType" minOccurs="0"/>
            <xsd:element name="coordinates" type="gml:CoordinatesType" minOccurs="0"/>
          </xsd:choice>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="AbstractGeometryType" abstract="true"/>
  <xsd:complexType name="LineStringType" mixed="false">
    <xsd:complexContent mixed="false">
      <xsd:extension base="gml:AbstractGeometryType">
        <xsd:sequence>
          <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="coord" type="gml:CoordType" minOccurs="0"/>
            <xsd:element name="coordinates" type="gml:CoordinatesType" minOccurs="0"/>
          </xsd:choice>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="CoordType">
    <xsd:sequence>
      <xsd:element name="X" type="xsd:decimal"/>
      <xsd:element name="Y" type="xsd:decimal" minOccurs="0"/>
      <xsd:element name="Z" type="xsd:decimal" minOccurs="0"/>
      <xsd:element name="Bulge" type="xsd:float" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

```

```

<xsd:complexType name="CoordinatesType">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="decimal" type="xsd:string" default="."/>
      <xsd:attribute name="cs" type="xsd:string" default=","/>
      <xsd:attribute name="ts" type="xsd:string" default=" "/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="LinearRingType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:AbstractGeometryType">
      <xsd:sequence>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
          <xsd:element name="coordinates" type="gml:CoordinatesType" minOccurs="0"/>
          <xsd:element name="coord" type="gml:CoordType" minOccurs="0"/>
        </xsd:choice>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PolygonType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:AbstractGeometryType">
      <xsd:sequence>
        <xsd:element name="outerBoundaryIs" type="gml:LinearRingType" minOccurs="0"/>
        <xsd:element name="innerBoundaryIs" type="gml:LinearRingType" minOccurs="0"
maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="AbstractGeometryCollectionBaseType" abstract="true"
mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:AbstractGeometryType"/>
  </xsd:complexContent>

```

```

</xsd:complexType>
<xsd:complexType name="GeometryCollectionType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:AbstractGeometryCollectionBaseType">
      <xsd:sequence>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
          <xsd:element name="polygonMember" type="gml:PolygonMemberType"
minOccurs="0"/>
          <xsd:element name="pointMember" type="gml:PointMemberType" minOccurs="0"/>
          <xsd:element name="geometryMember" type="gml:GeometryAssociationType"
minOccurs="0"/>
          <xsd:element name="lineStringMember" type="gml:LineStringMemberType"
minOccurs="0"/>
        </xsd:choice>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PolygonMemberType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryAssociationType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="GeometryAssociationType">
  <xsd:sequence>
    <xsd:choice>
      <xsd:element name="Point" type="gml:PointType" minOccurs="0"/>
      <xsd:element name="MultiLineString" type="gml:MultiLineStringType" minOccurs="0"/>
      <xsd:element name="MultiPoint" type="gml:MultiPointType" minOccurs="0"/>
      <xsd:element name="MultiPolygon" type="gml:MultiPolygonType" minOccurs="0"/>
      <xsd:element name="LineString" type="gml:LineStringType" minOccurs="0"/>
      <xsd:element name="Polygon" type="gml:PolygonType" minOccurs="0"/>
      <xsd:element name="LinearRing" type="gml:LinearRingType" minOccurs="0"/>
      <xsd:element name="MultiGeometry" type="gml:GeometryCollectionType"
minOccurs="0"/>
    </xsd:choice>
  </xsd:sequence>

```

```

</xsd:sequence>
<xsd:attribute ref="xlink:type"/>
<xsd:attribute ref="xlink:href"/>
<xsd:attribute ref="xlink:role"/>
<xsd:attribute ref="xlink:arcrole"/>
<xsd:attribute ref="xlink:title"/>
<xsd:attribute ref="xlink:show"/>
<xsd:attribute ref="xlink:actuate"/>
<xsd:attribute name="remoteSchema" type="xsd:anyURI" form="qualified"/>
</xsd:complexType>
<xsd:complexType name="MultiLineStringType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryCollectionType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="MultiPointType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryCollectionType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="MultiPolygonType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryCollectionType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PointMemberType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryAssociationType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="LineStringMemberType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:GeometryAssociationType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="LinearRingMemberType" mixed="false">
  <xsd:complexContent mixed="false">

```

```

    <xsd:extension base="gml:GeometryAssociationType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="BoxType" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="gml:AbstractGeometryType">
      <xsd:sequence>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
          <xsd:element name="coord" type="gml:CoordType" minOccurs="0"/>
          <xsd:element name="coordinates" type="gml:CoordinatesType" minOccurs="0"/>
        </xsd:choice>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
</xsd:schema>

```

4.6.3 Mspcommon

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.multispeak.org/Version_4.1_Release"
  elementFormDefault="qualified" attributeFormDefault="unqualified"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:tns="http://www.multispeak.org/Version_4.1_Release"
  xmlns:cpsm="cpsm_V4.1_Release" xmlns:gml="gml_V4.1_Release">
  <xsd:import namespace="cpsm_V4.1_Release" schemaLocation="cpsm.xsd"/>
  <xsd:import namespace="gml_V4.1_Release" schemaLocation="gml.xsd"/>
  <xsd:element name="MultiSpeakMsgHeader" type="tns:MultiSpeakMsgHeader"/>
  <xsd:complexType name="MultiSpeakMsgHeader">
    <xsd:attribute name="MajorVersion" type="xsd:integer"/>
    <xsd:attribute name="MinorVersion" type="xsd:integer"/>
    <xsd:attribute name="Build" type="xsd:integer"/>
    <xsd:attribute name="Branch" type="xsd:integer"/>
    <xsd:attribute name="BuildString" type="tns:BuildDescriptor" use="required"/>
    <xsd:attribute name="UserID" type="xsd:string"/>
  </xsd:complexType>

```

```

<xsd:attribute name="Pwd" type="xsd:string"/>
<xsd:attribute name="AppName" type="xsd:string"/>
<xsd:attribute name="AppVersion" type="xsd:string"/>
<xsd:attribute name="Company" type="xsd:string"/>
<xsd:attribute name="DefaultCurrencyCode" type="tns:DefaultCurrencyCode"/>
<xsd:attribute name="CSUnits" type="tns:MessageHeaderCSUnits" default="feet"/>
<xsd:attribute name="CoordinateSystemName" type="xsd:string"/>
<xsd:attribute name="CoordinateSystemAuthority" type="xsd:string"/>
<xsd:attribute name="CoordinateSystemAuthorityCode" type="xsd:string"/>
<xsd:attribute name="Datum" type="xsd:string"/>
<xsd:attribute name="SessionID" type="xsd:string"/>
<xsd:attribute name="PreviousSessionID" type="xsd:string"/>
<xsd:attribute name="ObjectsRemaining" type="xsd:integer"/>
<xsd:attribute name="LastSent" type="xsd:string"/>
<xsd:attribute name="RegistrationID" type="xsd:string"/>
<xsd:attribute name="MessageID" type="xsd:string"/>
<xsd:attribute name="TimeStamp" type="xsd:dateTime"/>
<xsd:attribute name="Context" type="tns:MessageContext"/>
<xsd:attribute name="AuditID" type="xsd:string"/>
<xsd:attribute name="AuditPassword" type="xsd:string"/>
<xsd:anyAttribute/>
</xsd:complexType>
<xsd:simpleType name="BuildDescriptor">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="PR"/>
    <xsd:enumeration value="RC"/>
    <xsd:enumeration value="Branch"/>
    <xsd:enumeration value="Release"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="MessageHeaderCSUnits">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="feet"/>
    <xsd:enumeration value="meters"/>
    <xsd:enumeration value="USSurveyFeet"/>
  </xsd:restriction>
</xsd:simpleType>

```

```
<xsd:enumeration value="other"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="MessageContext">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Production"/>
    <xsd:enumeration value="Testing"/>
    <xsd:enumeration value="Development"/>
    <xsd:enumeration value="Study"/>
    <xsd:enumeration value="Training"/>
    <xsd:enumeration value="Other"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="DefaultCurrencyCode">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="USD"/>
    <xsd:enumeration value="EUR"/>
    <xsd:enumeration value="AED"/>
    <xsd:enumeration value="AFN"/>
    <xsd:enumeration value="ALL"/>
    <xsd:enumeration value="AMD"/>
    <xsd:enumeration value="ANG"/>
    <xsd:enumeration value="AOA"/>
    <xsd:enumeration value="ARS"/>
    <xsd:enumeration value="AUD"/>
    <xsd:enumeration value="AWG"/>
    <xsd:enumeration value="AZN"/>
    <xsd:enumeration value="BAM"/>
    <xsd:enumeration value="BBD"/>
    <xsd:enumeration value="BDT"/>
    <xsd:enumeration value="BGN"/>
    <xsd:enumeration value="BHD"/>
    <xsd:enumeration value="BIF"/>
    <xsd:enumeration value="BMD"/>
    <xsd:enumeration value="BND"/>
    <xsd:enumeration value="BOB"/>
  </xsd:restriction>
</xsd:simpleType>
```



```
<xsd:enumeration value="BOV"/>
<xsd:enumeration value="BRL"/>
<xsd:enumeration value="BSD"/>
<xsd:enumeration value="BTN"/>
<xsd:enumeration value="BWP"/>
<xsd:enumeration value="BYR"/>
<xsd:enumeration value="BZD"/>
<xsd:enumeration value="CAD"/>
<xsd:enumeration value="CDF"/>
<xsd:enumeration value="CHE"/>
<xsd:enumeration value="CHF"/>
<xsd:enumeration value="CHW"/>
<xsd:enumeration value="CLF"/>
<xsd:enumeration value="CLP"/>
<xsd:enumeration value="CNY"/>
<xsd:enumeration value="COP"/>
<xsd:enumeration value="COU"/>
<xsd:enumeration value="CRC"/>
<xsd:enumeration value="CUP"/>
<xsd:enumeration value="CVE"/>
<xsd:enumeration value="CZK"/>
<xsd:enumeration value="DJF"/>
<xsd:enumeration value="DKK"/>
<xsd:enumeration value="DOP"/>
<xsd:enumeration value="DZD"/>
<xsd:enumeration value="EEK"/>
<xsd:enumeration value="EGP"/>
<xsd:enumeration value="ERN"/>
<xsd:enumeration value="ETB"/>
<xsd:enumeration value="FJD"/>
<xsd:enumeration value="FKP"/>
<xsd:enumeration value="GBP"/>
<xsd:enumeration value="GEL"/>
<xsd:enumeration value="GHS"/>
<xsd:enumeration value="GIP"/>
<xsd:enumeration value="GMD"/>
<xsd:enumeration value="GNF"/>
```

```
<xsd:enumeration value="GTQ"/>
<xsd:enumeration value="GYD"/>
<xsd:enumeration value="HKD"/>
<xsd:enumeration value="HNL"/>
<xsd:enumeration value="HRK"/>
<xsd:enumeration value="HTG"/>
<xsd:enumeration value="HUF"/>
<xsd:enumeration value="IDR"/>
<xsd:enumeration value="ILS"/>
<xsd:enumeration value="INR"/>
<xsd:enumeration value="IQD"/>
<xsd:enumeration value="IRR"/>
<xsd:enumeration value="ISK"/>
<xsd:enumeration value="JMD"/>
<xsd:enumeration value="JOD"/>
<xsd:enumeration value="JPY"/>
<xsd:enumeration value="KES"/>
<xsd:enumeration value="KGS"/>
<xsd:enumeration value="KHR"/>
<xsd:enumeration value="KMF"/>
<xsd:enumeration value="KPW"/>
<xsd:enumeration value="KRW"/>
<xsd:enumeration value="KWD"/>
<xsd:enumeration value="KYD"/>
<xsd:enumeration value="KZT"/>
<xsd:enumeration value="LAK"/>
<xsd:enumeration value="LBP"/>
<xsd:enumeration value="LKR"/>
<xsd:enumeration value="LRD"/>
<xsd:enumeration value="LSL"/>
<xsd:enumeration value="LTL"/>
<xsd:enumeration value="LVL"/>
<xsd:enumeration value="LYD"/>
<xsd:enumeration value="MAD"/>
<xsd:enumeration value="MDL"/>
<xsd:enumeration value="MGA"/>
```

```
<xsd:enumeration value="MKD"/>
<xsd:enumeration value="MMK"/>
<xsd:enumeration value="MNT"/>
<xsd:enumeration value="MOP"/>
<xsd:enumeration value="MRO"/>
<xsd:enumeration value="MUR"/>
<xsd:enumeration value="MVR"/>
<xsd:enumeration value="MWK"/>
<xsd:enumeration value="MXN"/>
<xsd:enumeration value="MXV"/>
<xsd:enumeration value="MYR"/>
<xsd:enumeration value="MZN"/>
<xsd:enumeration value="NAD"/>
<xsd:enumeration value="NGN"/>
<xsd:enumeration value="NIO"/>
<xsd:enumeration value="NOK"/>
<xsd:enumeration value="NPR"/>
<xsd:enumeration value="NZD"/>
<xsd:enumeration value="OMR"/>
<xsd:enumeration value="PAB"/>
<xsd:enumeration value="PEN"/>
<xsd:enumeration value="PGK"/>
<xsd:enumeration value="PHP"/>
<xsd:enumeration value="PKR"/>
<xsd:enumeration value="PLN"/>
<xsd:enumeration value="PYG"/>
<xsd:enumeration value="QAR"/>
<xsd:enumeration value="RON"/>
<xsd:enumeration value="RSD"/>
<xsd:enumeration value="RUB"/>
<xsd:enumeration value="RWF"/>
<xsd:enumeration value="SAR"/>
<xsd:enumeration value="SBD"/>
<xsd:enumeration value="SCR"/>
<xsd:enumeration value="SDG"/>
<xsd:enumeration value="SEK"/>
<xsd:enumeration value="SGD"/>
```

```
<xsd:enumeration value="SHP"/>
<xsd:enumeration value="SKK"/>
<xsd:enumeration value="SLL"/>
<xsd:enumeration value="SOS"/>
<xsd:enumeration value="SRD"/>
<xsd:enumeration value="STD"/>
<xsd:enumeration value="SYP"/>
<xsd:enumeration value="SZL"/>
<xsd:enumeration value="THB"/>
<xsd:enumeration value="TJS"/>
<xsd:enumeration value="TMM"/>
<xsd:enumeration value="TND"/>
<xsd:enumeration value="TOP"/>
<xsd:enumeration value="TRY"/>
<xsd:enumeration value="TTD"/>
<xsd:enumeration value="TWD"/>
<xsd:enumeration value="TZS"/>
<xsd:enumeration value="UAH"/>
<xsd:enumeration value="UGX"/>
<xsd:enumeration value="USN"/>
<xsd:enumeration value="USS"/>
<xsd:enumeration value="UYU"/>
<xsd:enumeration value="UZS"/>
<xsd:enumeration value="VEF"/>
<xsd:enumeration value="VND"/>
<xsd:enumeration value="VUV"/>
<xsd:enumeration value="WST"/>
<xsd:enumeration value="XAF"/>
<xsd:enumeration value="XAG"/>
<xsd:enumeration value="XAU"/>
<xsd:enumeration value="XBA"/>
<xsd:enumeration value="XBB"/>
<xsd:enumeration value="XBC"/>
<xsd:enumeration value="XBD"/>
<xsd:enumeration value="XCD"/>
<xsd:enumeration value="XDR"/>
```

```
<xsd:enumeration value="XFU"/>
<xsd:enumeration value="XOF"/>
<xsd:enumeration value="XPD"/>
<xsd:enumeration value="XPF"/>
<xsd:enumeration value="XPT"/>
<xsd:enumeration value="XTS"/>
<xsd:enumeration value="XXX"/>
<xsd:enumeration value="YER"/>
<xsd:enumeration value="ZAR"/>
<xsd:enumeration value="ZMK"/>
<xsd:enumeration value="ZWD"/>
<xsd:enumeration value="ADF"/>
<xsd:enumeration value="ADP"/>
<xsd:enumeration value="ATS"/>
<xsd:enumeration value="BEF"/>
<xsd:enumeration value="CYP"/>
<xsd:enumeration value="DEM"/>
<xsd:enumeration value="ESP"/>
<xsd:enumeration value="FIM"/>
<xsd:enumeration value="FRF"/>
<xsd:enumeration value="GRD"/>
<xsd:enumeration value="IEP"/>
<xsd:enumeration value="ITL"/>
<xsd:enumeration value="LUF"/>
<xsd:enumeration value="MCF"/>
<xsd:enumeration value="MTL"/>
<xsd:enumeration value="NLG"/>
<xsd:enumeration value="PTE"/>
<xsd:enumeration value="SIT"/>
<xsd:enumeration value="SML"/>
<xsd:enumeration value="VAL"/>
<xsd:enumeration value="XEU"/>
<xsd:enumeration value="Other"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="loadActionCode">
  <xsd:restriction base="xsd:string">
```

```

<xsd:enumeration value="Connect"/>
<xsd:enumeration value="Disconnect"/>
<xsd:enumeration value="InitiatePowerLimitation"/>
<xsd:enumeration value="Opened"/>
<xsd:enumeration value="Closed"/>
<xsd:enumeration value="Open"/>
<xsd:enumeration value="Close"/>
<xsd:enumeration value="Armed"/>
<xsd:enumeration value="Enabled"/>
<xsd:enumeration value="Disabled"/>
<xsd:enumeration value="Arm"/>
<xsd:enumeration value="Enable"/>
<xsd:enumeration value="Disable"/>
<xsd:enumeration value="Unknown"/>
</xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="uom">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Acre ft"/>
    <xsd:enumeration value="Amps"/>
    <xsd:enumeration value="Amps RMS"/>
    <xsd:enumeration value="Amps squared RMS"/>
    <xsd:enumeration value="atmospheres"/>
    <xsd:enumeration value="Bar"/>
    <xsd:enumeration value="ccf"/>
    <xsd:enumeration value="ccf per Hr"/>
    <xsd:enumeration value="cm"/>
    <xsd:enumeration value="Corrosion"/>
    <xsd:enumeration value="Counter"/>
    <xsd:enumeration value="cubic feet"/>
    <xsd:enumeration value="cubic feet corrected"/>
    <xsd:enumeration value="cubic feet per Hr"/>
    <xsd:enumeration value="cubic feet per Hr corrected"/>
    <xsd:enumeration value="cubic feet per Hr uncorrected"/>
    <xsd:enumeration value="cubic feet uncorrected"/>
    <xsd:enumeration value="cubic meter"/>
  </xsd:restriction>
</xsd:simpleType>

```

```

<xsd:enumeration value="cubic meter per Hr"/>
<xsd:enumeration value="cubic meters corrected"/>
<xsd:enumeration value="cubic meters per Hr corrected"/>
<xsd:enumeration value="cubic meters per Hr uncorrected"/>
<xsd:enumeration value="cubic meters uncorrected"/>
<xsd:enumeration value="Current phase angle"/>
<xsd:enumeration value="Date"/>
<xsd:enumeration value="Date time"/>
<xsd:enumeration value="deg C"/>
<xsd:enumeration value="deg F"/>
<xsd:enumeration value="deg K"/>
<xsd:enumeration value="Differential pascal"/>
<xsd:enumeration value="Differential pound per square inch"/>
<xsd:enumeration value="dm"/>
<xsd:enumeration value="Dollar"/>
<xsd:enumeration value="feet per second"/>
<xsd:enumeration value="Frequency"/>
<xsd:enumeration value="ft"/>
<xsd:enumeration value="ft of water"/>
<xsd:enumeration value="GQ"/>
<xsd:enumeration value="GQh"/>
<xsd:enumeration value="Gram square cm"/>
<xsd:enumeration value="GVA"/>
<xsd:enumeration value="GVAh"/>
<xsd:enumeration value="GVAR"/>
<xsd:enumeration value="GVARh"/>
<xsd:enumeration value="GW"/>
<xsd:enumeration value="GWh"/>
<xsd:enumeration value="IMP gl"/>
<xsd:enumeration value="IMP gl per Hr"/>
<xsd:enumeration value="inches"/>
<xsd:enumeration value="Inches H2O column"/>
<xsd:enumeration value="Inches HG column"/>
<xsd:enumeration value="inches of water"/>
<xsd:enumeration value="Interval timer"/>
<xsd:enumeration value="Ionization"/>
<xsd:enumeration value="Joules"/>

```

```

<xsd:enumeration value="Joules per Hr"/>
<xsd:enumeration value="kAmps"/>
<xsd:enumeration value="kAmps RMS"/>
<xsd:enumeration value="kAmps squared RMS"/>
<xsd:enumeration value="kJoules"/>
<xsd:enumeration value="kJoules per Hr"/>
<xsd:enumeration value="km"/>
<xsd:enumeration value="km per hour"/>
<xsd:enumeration value="km per second"/>
<xsd:enumeration value="kQ"/>
<xsd:enumeration value="kQh"/>
<xsd:enumeration value="kV"/>
<xsd:enumeration value="kV RMS"/>
<xsd:enumeration value="kVA"/>
<xsd:enumeration value="kVAh"/>
<xsd:enumeration value="kVAR"/>
<xsd:enumeration value="kVARh"/>
<xsd:enumeration value="kVsquared RMS"/>
<xsd:enumeration value="kW"/>
<xsd:enumeration value="kWh"/>
<xsd:enumeration value="liters"/>
<xsd:enumeration value="m"/>
<xsd:enumeration value="m per second"/>
<xsd:enumeration value="mAmps"/>
<xsd:enumeration value="Mamps"/>
<xsd:enumeration value="mAmps RMS"/>
<xsd:enumeration value="Mamps RMS"/>
<xsd:enumeration value="Mamps squared RMS"/>
<xsd:enumeration value="mAmps squared RMS"/>
<xsd:enumeration value="Meter HG column"/>
<xsd:enumeration value="micro m"/>
<xsd:enumeration value="microAmps"/>
<xsd:enumeration value="microAmps RMS"/>
<xsd:enumeration value="microAmps squared RMS"/>
<xsd:enumeration value="microJoules"/>
<xsd:enumeration value="microJoules per Hr"/>

```



```

<xsd:enumeration value="microQ"/>
<xsd:enumeration value="microQh"/>
<xsd:enumeration value="microV"/>
<xsd:enumeration value="microV RMS"/>
<xsd:enumeration value="microVA"/>
<xsd:enumeration value="microVAh"/>
<xsd:enumeration value="microVAR"/>
<xsd:enumeration value="microVARh"/>
<xsd:enumeration value="microVsquared RMS"/>
<xsd:enumeration value="microW"/>
<xsd:enumeration value="microWh"/>
<xsd:enumeration value="Minutes on battery"/>
<xsd:enumeration value="mJoules"/>
<xsd:enumeration value="MJoules"/>
<xsd:enumeration value="MJoules per Hr"/>
<xsd:enumeration value="mJoules per Hr"/>
<xsd:enumeration value="mm"/>
<xsd:enumeration value="mph"/>
<xsd:enumeration value="MQ"/>
<xsd:enumeration value="mQ"/>
<xsd:enumeration value="MQh"/>
<xsd:enumeration value="mQh"/>
<xsd:enumeration value="MV"/>
<xsd:enumeration value="mV"/>
<xsd:enumeration value="MV RMS"/>
<xsd:enumeration value="mV RMS"/>
<xsd:enumeration value="mVA"/>
<xsd:enumeration value="MVA"/>
<xsd:enumeration value="MVAh"/>
<xsd:enumeration value="mVAh"/>
<xsd:enumeration value="MVAR"/>
<xsd:enumeration value="mVAR"/>
<xsd:enumeration value="mVARh"/>
<xsd:enumeration value="MVARh"/>
<xsd:enumeration value="mVsquared RMS"/>
<xsd:enumeration value="MV squared RMS"/>
<xsd:enumeration value="MW"/>

```

```

<xsd:enumeration value="mW"/>
<xsd:enumeration value="mWh"/>
<xsd:enumeration value="MWh"/>
<xsd:enumeration value="Nbr of amps T.H.D. excess"/>
<xsd:enumeration value="Nbr of demand resets"/>
<xsd:enumeration value="Nbr of encoder tamper"/>
<xsd:enumeration value="Nbr of excursion high"/>
<xsd:enumeration value="Nbr of excursion low"/>
<xsd:enumeration value="Nbr of inversion"/>
<xsd:enumeration value="Nbr of physical tamper"/>
<xsd:enumeration value="Nbr of power loss"/>
<xsd:enumeration value="Nbr of power outage"/>
<xsd:enumeration value="Nbr of pulse"/>
<xsd:enumeration value="Nbr of removal"/>
<xsd:enumeration value="Nbr of reprogramming"/>
<xsd:enumeration value="Nbr of reverse rotation"/>
<xsd:enumeration value="Nbr of sag"/>
<xsd:enumeration value="Nbr of swells"/>
<xsd:enumeration value="Nbr of times programmed"/>
<xsd:enumeration value="Nbr of V T.H.D. excess"/>
<xsd:enumeration value="Nbr of voltage unbalance"/>
<xsd:enumeration value="Nbr of watchdog"/>
<xsd:enumeration value="Normal voltage period"/>
<xsd:enumeration value="percent"/>
<xsd:enumeration value="percent relative humidity"/>
<xsd:enumeration value="PH factor"/>
<xsd:enumeration value="pounds per square foot"/>
<xsd:enumeration value="Power factor"/>
<xsd:enumeration value="PPM chlorine"/>
<xsd:enumeration value="PPM lead"/>
<xsd:enumeration value="PPM odorant"/>
<xsd:enumeration value="PPM SO2"/>
<xsd:enumeration value="Q"/>
<xsd:enumeration value="Qh"/>
<xsd:enumeration value="Sense input"/>
<xsd:enumeration value="Static pascal"/>

```

```

    <xsd:enumeration value="Static pound per square inch"/>
    <xsd:enumeration value="T.H.D. Current"/>
    <xsd:enumeration value="T.H.D. Voltage"/>
    <xsd:enumeration value="Therm"/>
    <xsd:enumeration value="Therm per Hr"/>
    <xsd:enumeration value="Time"/>
    <xsd:enumeration value="turbidity"/>
    <xsd:enumeration value="US gl"/>
    <xsd:enumeration value="US gl per Hr"/>
    <xsd:enumeration value="V"/>
    <xsd:enumeration value="V RMS"/>
    <xsd:enumeration value="VA"/>
    <xsd:enumeration value="VAh"/>
    <xsd:enumeration value="VAR"/>
    <xsd:enumeration value="VARh"/>
    <xsd:enumeration value="Voltage phase angle"/>
    <xsd:enumeration value="Vsquared RMS"/>
    <xsd:enumeration value="W"/>
    <xsd:enumeration value="Wh"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="outageEventType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Instantaneous"/>
    <xsd:enumeration value="Outage"/>
    <xsd:enumeration value="Restoration"/>
    <xsd:enumeration value="NoResponse"/>
    <xsd:enumeration value="Inferred"/>
    <xsd:enumeration value="PowerOn"/>
    <xsd:enumeration value="PowerOff"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="serviceType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Electric"/>

```

```

    <xsd:enumeration value="Gas"/>
    <xsd:enumeration value="Water"/>
    <xsd:enumeration value="Propane"/>
    <xsd:enumeration value="Refuse"/>
    <xsd:enumeration value="Sewer"/>
    <xsd:enumeration value="Telecom"/>
    <xsd:enumeration value="TV"/>
    <xsd:enumeration value="Cable"/>
    <xsd:enumeration value="Heating"/>
    <xsd:enumeration value="Steam"/>
    <xsd:enumeration value="Transportation"/>
    <xsd:enumeration value="All"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unknown"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="action">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="New"/>
    <xsd:enumeration value="Change"/>
    <xsd:enumeration value="Delete"/>
    <xsd:enumeration value="Replace"/>
    <xsd:enumeration value="Link"/>
    <xsd:enumeration value="Unlink"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="mspObject" abstract="true">
  <xsd:sequence>
    <xsd:element name="extensions" type="tns:extensions" minOccurs="0"/>
    <xsd:element name="comments" type="xsd:string" minOccurs="0"/>
    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
    <xsd:element name="objectName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="identifiedObject" type="cpsm:IdentifiedObject" minOccurs="0"/>
  </xsd:sequence>
  <xsd:attribute name="objectID" type="xsd:string"/>
  <xsd:attribute name="verb" type="tns:action" default="Change"/>

```

```

    <xsd:attribute name="errorString" type="xsd:string"/>
    <xsd:attribute name="replaceID" type="xsd:string"/>
    <xsd:attribute name="utility" type="xsd:string"/>
    <xsd:anyAttribute/>
  </xsd:complexType>
  <xsd:complexType name="extensions">
    <xsd:sequence>
      <xsd:any minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ArrayOfExtensionsItem">
    <xsd:sequence>
      <xsd:element name="extensionsItem" type="tns:extensionsItem" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="extensionsItem">
    <xsd:sequence>
      <xsd:element name="extName" type="xsd:string" minOccurs="0"/>
      <xsd:element name="extValue" type="tns:extValue" minOccurs="0"/>
      <xsd:element name="extType" type="tns:extType" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="extValue">
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="units" type="tns:uom"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="extType">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="anySimpleType"/>
      <xsd:enumeration value="anyType"/>
      <xsd:enumeration value="anyURI"/>
      <xsd:enumeration value="base64Binary"/>
      <xsd:enumeration value="boolean"/>
    </xsd:restriction>
  </xsd:simpleType>

```

```
<xsd:enumeration value="byte"/>
<xsd:enumeration value="date"/>
<xsd:enumeration value="dateTime"/>
<xsd:enumeration value="decimal"/>
<xsd:enumeration value="double"/>
<xsd:enumeration value="duration"/>
<xsd:enumeration value="ENTITIES"/>
<xsd:enumeration value="ENTITY"/>
<xsd:enumeration value="float"/>
<xsd:enumeration value="gDay"/>
<xsd:enumeration value="gMonth"/>
<xsd:enumeration value="gMonthDay"/>
<xsd:enumeration value="gYear"/>
<xsd:enumeration value="gYearMonth"/>
<xsd:enumeration value="hexBinary"/>
<xsd:enumeration value="ID"/>
<xsd:enumeration value="IDREF"/>
<xsd:enumeration value="IDREFS"/>
<xsd:enumeration value="int"/>
<xsd:enumeration value="integer"/>
<xsd:enumeration value="language"/>
<xsd:enumeration value="long"/>
<xsd:enumeration value="Name"/>
<xsd:enumeration value="NCName"/>
<xsd:enumeration value="negativeInteger"/>
<xsd:enumeration value="NMTOKEN"/>
<xsd:enumeration value="NMTOKENS"/>
<xsd:enumeration value="nonNegativeInteger"/>
<xsd:enumeration value="nonPositiveInteger"/>
<xsd:enumeration value="normalizedString"/>
<xsd:enumeration value="NOTATION"/>
<xsd:enumeration value="positiveInteger"/>
<xsd:enumeration value="QName"/>
<xsd:enumeration value="short"/>
<xsd:enumeration value="string"/>
<xsd:enumeration value="time"/>
```

```

    <xsd:enumeration value="token"/>
    <xsd:enumeration value="unsignedByte"/>
    <xsd:enumeration value="unsignedInt"/>
    <xsd:enumeration value="unsignedLong"/>
    <xsd:enumeration value="unsignedShort"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="ArrayOfErrorObject">
  <xsd:sequence>
    <xsd:element ref="tns:errorObject" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="errorObject">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="objectID" type="xsd:string"/>
      <xsd:attribute name="errorString" type="xsd:string"/>
      <xsd:attribute name="nounType" type="xsd:string"/>
      <xsd:attribute name="eventTime" type="xsd:dateTime"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:element name="errorObject" type="tns:errorObject" nillable="true"/>
<xsd:complexType name="meterID">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="meterNo" type="xsd:string"/>
      <xsd:attribute name="serviceType" type="tns:serviceType"/>
      <xsd:attribute name="objectID" type="xsd:string"/>
      <xsd:attribute name="utility" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="ArrayOfReadingValue">
  <xsd:sequence>
    <xsd:element ref="tns:readingValue" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>

```

```

</xsd:complexType>
<xsd:complexType name="readingValue">
  <xsd:sequence>
    <xsd:element name="extensions" type="tns:extensions" minOccurs="0"/>
    <xsd:element name="extensionsList" type="tns:ArrayOfExtensionsItem" minOccurs="0"/>
    <xsd:element name="units" type="tns:uom" minOccurs="0"/>
    <xsd:element name="value" type="xsd:string" minOccurs="0"/>
    <xsd:element name="ratePeriod" type="xsd:string" minOccurs="0"/>
    <xsd:element name="readingType" type="xsd:string" minOccurs="0"/>
    <xsd:element name="fieldName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="name" type="xsd:string" minOccurs="0"/>
    <xsd:element name="measurementPeriod" type="tns:measurementPeriod" minOccurs="0"/>
    <xsd:element name="timeStamp" type="xsd:dateTime" minOccurs="0"/>
    <xsd:element name="readingStatusCode" type="tns:readingStatusCode" minOccurs="0"/>
    <xsd:element name="readingTypeCode" type="tns:readingTypeCode" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="measurementPeriod">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Current"/>
    <xsd:enumeration value="Previous"/>
    <xsd:enumeration value="Previous Season"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="readingStatusCode">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="originatingSystemID" type="xsd:string"/>
      <xsd:attribute name="codeCategory" type="xsd:string"/>
      <xsd:attribute name="codeIndex" type="xsd:string"/>
      <xsd:anyAttribute/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="readingTypeCode">
  <xsd:simpleContent>

```



```

<xsd:extension base="xsd:string">
  <xsd:attribute name="name" type="xsd:string"/>
  <xsd:attribute name="timeAttribute" type="xsd:string"/>
  <xsd:attribute name="dataQualifier" type="xsd:string"/>
  <xsd:attribute name="accumulationBehavior" type="xsd:string"/>
  <xsd:attribute name="flowDirection" type="xsd:string"/>
  <xsd:attribute name="UOMCategory" type="xsd:string"/>
  <xsd:attribute name="measurementCategory" type="xsd:string"/>
  <xsd:attribute name="phaseIndex" type="xsd:string"/>
  <xsd:attribute name="unitsMultiplier" type="xsd:string"/>
  <xsd:attribute name="displayableUOM" type="xsd:string"/>
  <xsd:anyAttribute/>
</xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:element name="readingValues" type="tns:ArrayOfReadingValue"/>
<xsd:element name="readingValue" type="tns:readingValue"/>
<xsd:complexType name="ArrayOfMeterIDNillable">
  <xsd:sequence>
    <xsd:element name="meterID" type="tns:meterID" nillable="true" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfMeterID">
  <xsd:sequence>
    <xsd:element name="meterID" type="tns:meterID" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="meterReading" mixed="false">
  <xsd:complexContent mixed="false">
    <xsd:extension base="tns:mspObject">
      <xsd:sequence>
        <xsd:element name="meterID" type="tns:meterID" minOccurs="0"/>
        <xsd:element name="deviceID" type="xsd:string" minOccurs="0"/>
        <xsd:element ref="tns:readingValues" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

```

```

    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ArrayOfMeterReading">
  <xsd:sequence>
    <xsd:element name="meterReading" type="tns:meterReading" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="objectRef">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="name" type="xsd:string"/>
      <xsd:attribute name="noun" type="xsd:QName"/>
      <xsd:attribute name="objectID" type="xsd:string"/>
      <xsd:attribute name="utility" type="xsd:string"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef">
  <xsd:sequence>
    <xsd:element name="locationReference" type="tns:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef1">
  <xsd:sequence>
    <xsd:element name="cabinetContentsItem" type="tns:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef2">
  <xsd:sequence>
    <xsd:element name="contentsItem" type="tns:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>

```

```

</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef3">
  <xsd:sequence>
    <xsd:element name="applicationPoint" type="tns:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef4">
  <xsd:sequence>
    <xsd:element name="jobID" type="tns:objectRef" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfObjectRef5">
  <xsd:sequence>
    <xsd:element name="objectRef" type="tns:objectRef" nillable="true" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfConfigurationGroupIDs">
  <xsd:sequence>
    <xsd:element name="configurationGroupID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfPremiseIDs">
  <xsd:sequence>
    <xsd:element name="premiseID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfVehicleIDs">
  <xsd:sequence>
    <xsd:element name="vehicleID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>

```

```

<xsd:complexType name="ArrayOfEquipmentIDs">
  <xsd:sequence>
    <xsd:element name="equipmentID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfWorkerIDs">
  <xsd:sequence>
    <xsd:element name="workerID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfFixedChargeCodes">
  <xsd:sequence>
    <xsd:element name="fixedChargeCode" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfInformationItems">
  <xsd:sequence>
    <xsd:element name="informationItem" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfTransactionTypes">
  <xsd:sequence>
    <xsd:element name="transactionType" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfVals">
  <xsd:sequence>
    <xsd:element name="val" type="xsd:string" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfString">

```

```

<xsd:sequence>
  <xsd:element name="string" type="xsd:string" nillable="true" minOccurs="0"
maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfCrewIDs">
  <xsd:sequence>
    <xsd:element name="crewID" type="xsd:string" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfSkillIDs">
  <xsd:sequence>
    <xsd:element name="skillID" type="xsd:string" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfCapabilityIDs">
  <xsd:sequence>
    <xsd:element name="capabilityID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfLoadManagementDeviceIDs">
  <xsd:sequence>
    <xsd:element name="loadManagementDeviceID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfInHomeDisplayIDs">
  <xsd:sequence>
    <xsd:element name="inHomeDisplayID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ArrayOfMeterGroupIDs">
  <xsd:sequence>
    <xsd:element name="meterGroupID" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>

```

```

    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ArrayOfMeterStatuses">
    <xsd:sequence>
      <xsd:element name="meterStatus" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:element name="GetPublishMethodsResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="GetPublishMethodsResult" type="tns:ArrayOfString"
minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name="ArrayOfMethodNames">
    <xsd:sequence>
      <xsd:element name="methodName" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ArrayOfReadingTypes">
    <xsd:sequence>
      <xsd:element name="readingType" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ArrayOfSealNumbers">
    <xsd:sequence>
      <xsd:element name="sealNumber" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:element name="GetDomainNamesResponse">
    <xsd:complexType>

```

```

    <xsd:sequence>
      <xsd:element name="GetDomainNamesResult" type="tns:ArrayOfString"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="GetMethodsResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="GetMethodsResult" type="tns:ArrayOfString" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xsd:schema>

```

4.6.4 Xlink

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.w3.org/1999/xlink"
elementFormDefault="qualified" attributeFormDefault="unqualified"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xlink="http://www.w3.org/1999/xlink">
  <xsd:attribute name="type" type="xsd:string"/>
  <xsd:attribute name="href" type="xsd:anyURI"/>
  <xsd:attribute name="role" type="xsd:anyURI"/>
  <xsd:attribute name="arcrole" type="xsd:anyURI"/>
  <xsd:attribute name="title" type="xsd:string"/>
  <xsd:attribute name="show" type="xlink:GeometryAssociationTypeShow"/>
  <xsd:simpleType name="GeometryAssociationTypeShow">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="new"/>
      <xsd:enumeration value="replace"/>
      <xsd:enumeration value="embed"/>
      <xsd:enumeration value="other"/>
      <xsd:enumeration value="none"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:schema>

```

```
</xsd:simpleType>
<xsd:attribute name="actuate" type="xlink:GeometryAssociationTypeActuate"/>
<xsd:simpleType name="GeometryAssociationTypeActuate">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="onLoad"/>
    <xsd:enumeration value="onRequest"/>
    <xsd:enumeration value="other"/>
    <xsd:enumeration value="none"/>
  </xsd:restriction>
</xsd:simpleType>
</xsd:schema>
```


5 Annex B Payloads Examples

5.1 MeterAddNotification (Commissioning)

5.1.1 Request

POST /content/multispeak/specifications/416/MR_Server.asmx HTTP/1.1

Host: multispeakorg.net

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

<?xml version="1.0" encoding="utf-8"?>

<soap12:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap12="http://www.w3.org/2003/05/soap-envelope">

<soap12:Header>

<MultiSpeakMsgHeader MajorVersion="integer" MinorVersion="integer" Build="integer" Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string" Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string" CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string" SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string" RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or Development or Study or Training or Other" AuditID="string" AuditPassword="string"

```

xmlns="http://www.multispeak.org/Version_4.1_Release" />
</soap12:Header>
<soap12:Body>
  <MeterAddNotification xmlns="http://www.multispeak.org/Version_4.1_Release">
    <addedMeters>
      <electricMeters>
        <electricMeter>
          <meterBaselD>string</meterBaselD>
          <electricNameplate xsi:nil="true" />
          <electricLocationFields xsi:nil="true" />
          <sealNumberList xsi:nil="true" />
          <parentMeterList xsi:nil="true" />
          <subMeterList xsi:nil="true" />
          <meterConnectionStatus>Other or Connected or Disconnected or DisconnectedNonPay or
Unknown</meterConnectionStatus>
          <configuredReadingTypes xsi:nil="true" />
          <meterCommAddress>string</meterCommAddress>
          <billingStatusInformation xsi:nil="true" />
          <remoteReconnectSetting>Other or Connect or Arm or PowerLimitation or CISAuthRequired or
None or Unknown</remoteReconnectSetting>
        </electricMeter>
      </electricMeters>
    </addedMeters>
  </MeterAddNotification>
</soap12:Body>
</soap12:Envelope>

```

5.1.2 Response

HTTP/1.1 200 OK

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

<?xml version="1.0" encoding="utf-8"?>

<soap12:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap12="http://www.w3.org/2003/05/soap-envelope">

<soap12:Header>

<MultiSpeakMsgHeader MajorVersion="integer" MinorVersion="integer" Build="integer" Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string" Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string" CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string" SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string" RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or Development or Study or Training or Other" AuditID="string" AuditPassword="string" xmlns="http://www.multispeak.org/Version_4.1_Release" />

</soap12:Header>

<soap12:Body>

<MeterAddNotificationResponse xmlns="http://www.multispeak.org/Version_4.1_Release">

<MeterAddNotificationResult>

```

    <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
    <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
  </MeterAddNotificationResult>
</MeterAddNotificationResponse>
</soap12:Body>
</soap12:Envelope>

```

5.2 MeterRemoveNotification (Decommissioning)

5.2.1 Request

POST /content/multispeak/specifications/416/MR_Server.asmx HTTP/1.1

Host: multispeakorg.net

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

<?xml version="1.0" encoding="utf-8"?>

```

<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"    xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">

```

<soap12:Header>

```

    <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or

```

PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string" CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string" SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string" RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or Development or Study or Training or Other" AuditID="string" AuditPassword="string" xmlns="http://www.multispeak.org/Version_4.1_Release" />

</soap12:Header>

<soap12:Body>

<MeterRemoveNotification xmlns="http://www.multispeak.org/Version_4.1_Release">

<removedMeters>

<electricMeters>

<electricMeter>

<meterBaselD>string</meterBaselD>

<electricNameplate xsi:nil="true" />

<electricLocationFields xsi:nil="true" />

<sealNumberList xsi:nil="true" />

<parentMeterList xsi:nil="true" />

<subMeterList xsi:nil="true" />

<meterConnectionStatus>Other or Connected or Disconnected or DisconnectedNonPay or Unknown</meterConnectionStatus>

<configuredReadingTypes xsi:nil="true" />

<meterCommAddress>string</meterCommAddress>

<billingStatusInformation xsi:nil="true" />

<remoteReconnectSetting>Other or Connect or Arm or PowerLimitation or CISAuthRequired or None or Unknown</remoteReconnectSetting>

</electricMeter>

</electricMeters>

</removedMeters>

```

    </MeterRemoveNotification>

</soap12:Body>

</soap12:Envelope>

```

5.2.2 Response

HTTP/1.1 200 OK

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

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

```

<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"      xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">

```

```
  <soap12:Header>
```

```

    <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or
FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
CoordinateSystemAuthority="string"      CoordinateSystemAuthorityCode="string"      Datum="string"
SessionID="string"      PreviousSessionID="string"      ObjectsRemaining="integer"      LastSent="string"
RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
Development or Study or Training or Other" AuditID="string" AuditPassword="string"

```

```

xmlns="http://www.multispeak.org/Version_4.1_Release" />
</soap12:Header>
<soap12:Body>
  <MeterRemoveNotificationResponse xmlns="http://www.multispeak.org/Version_4.1_Release">
    <MeterRemoveNotificationResult>
      <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
      <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
    </MeterRemoveNotificationResult>
  </MeterRemoveNotificationResponse>
</soap12:Body>
</soap12:Envelope>

```

5.3 InitiateConnectDisconnect (Connection, Disconnection)

5.3.1 Request

POST /content/multispeak/specifications/416/CD_Server.asmx HTTP/1.1

Host: multispeakorg.net

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

<?xml version="1.0" encoding="utf-8"?>

```

<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"    xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">

```

<soap12:Header>

```

  <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or

```

GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string" CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string" SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string" RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or Development or Study or Training or Other" AuditID="string" AuditPassword="string" xmlns="http://www.multispeak.org/Version_4.1_Release" />

</soap12:Header>

<soap12:Body>

<InitiateConnectDisconnect xmlns="http://www.multispeak.org/Version_4.1_Release">

<cdEvents>

<connectDisconnectEvent>

<serviceLocationID>string</serviceLocationID>

<customerID>string</customerID>

<gridLocation>string</gridLocation>

<accountNumber>string</accountNumber>

<meterID meterNo="string" serviceType="Electric or Gas or Water or Propane or Refuse or Sewer or Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown" objectID="string" utility="string" />

<loadActionCode>Connect or Disconnect or InitiatePowerLimitation or CancelPowerLimitation or Opened or Closed or Open or Close or Armed or Enabled or Disabled or Arm or Enable or Disable or Unknown</loadActionCode>

<powerLimitationValue units="kWh or kW or A" />

<CDReasonCode>Other or PPMBalanceNegative or PPMBalancePositive or NonPayment or ServiceInactive or PaymentAgreement or PaymentReceived or NewCustomer or ServiceRestored or ServiceReconnected or Unknown</CDReasonCode>

<amountDue currencyCode="USD or EUR or ADF or ADP or AED or AFN or ALL or AMD or ANG or AOA or ARS or ATS or AUD or AWG or AZN or BAM or BBD or BDT or BEF or BGN or BHD or BIF or

BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or CVE or CYP or CZK or DEM or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ESP or ETB or FIM or FJD or FKP or FRF or GBP or GEL or GHS or GIP or GMD or GNF or GRD or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or IEP or ILS or INR or IQD or IRR or ISK or ITL or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LUF or LVL or LYD or MAD or MCF or MDL or MGA or MKD or MMK or MNT or MOP or MRO or MTL or MUR or MVR or MWK or MXN or MXV or MYR or MZN or NAD or NGN or NIO or NLG or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or PTE or PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or SIT or SKK or SLL or SML or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VAL or VEF or VND or VUV or WST or XAF or XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XEU or XFU or XOF or XPD or XPF or XPT or XTS or XXX or YER or ZAR or ZMK or ZWD or Other" />

<serviceType>Electric or Gas or Water or Propane or Refuse or Sewer or Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown</serviceType>

<billingTerms>string</billingTerms>

</connectDisconnectEvent>

</cdEvents>

<responseURL>string</responseURL>

<transactionID>string</transactionID>

<expTime />

</InitiateConnectDisconnect>

</soap12:Body>

</soap12:Envelope>

5.3.2 Response

HTTP/1.1 200 OK

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

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

```
<soap12:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">
```

```
<soap12:Header>
```

```
<MultiSpeakMsgHeader MajorVersion="integer" MinorVersion="integer" Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or
FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string"
SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string"
RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
Development or Study or Training or Other" AuditID="string" AuditPassword="string"
xmlns="http://www.multispeak.org/Version_4.1_Release" />
```

```
</soap12:Header>
```

```
<soap12:Body>
```

```
<InitiateConnectDisconnectResponse xmlns="http://www.multispeak.org/Version_4.1_Release">
```

```
<InitiateConnectDisconnectResult>
```

```
<errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
```

```
<errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
```

```
</InitiateConnectDisconnectResult>
```

```

</InitiateConnectDisconnectResponse>

</soap12:Body>

</soap12:Envelope>

```

5.4 InitiateMeterReadingsByMeterId (On-Demand Meter Reading)

5.4.1 Request

POST /content/multispeak/specifications/416/MR_Server.asmx HTTP/1.1

Host: multispeakorg.net

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

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

```

<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"    xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">

```

```
  <soap12:Header>
```

```

    <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or

```

```

FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string"
SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string"
RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
Development or Study or Training or Other" AuditID="string" AuditPassword="string"
xmlns="http://www.multispeak.org/Version_4.1_Release" />

</soap12:Header>

<soap12:Body>

  <InitiateMeterReadingsByMeterID xmlns="http://www.multispeak.org/Version_4.1_Release">

    <meterIDs>

      <meterID meterNo="string" serviceType="Electric or Gas or Water or Propane or Refuse or Sewer or
Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown"
objectID="string" utility="string" />

      <meterID meterNo="string" serviceType="Electric or Gas or Water or Propane or Refuse or Sewer or
Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown"
objectID="string" utility="string" />

    </meterIDs>

    <responseURL>string</responseURL>

    <transactionID>string</transactionID>

    <expTime />

  </InitiateMeterReadingsByMeterID>

</soap12:Body>

</soap12:Envelope>

```

5.4.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/soap+xml; charset=utf-8
Content-Length: length

<?xml version="1.0" encoding="utf-8"?>

<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"    xmlns:soap12="http://www.w3.org/2003/05/soap-

```

```

envelope">
  <soap12:Header>
    <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
    Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
    Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
    EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
    BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
    BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
    CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
    GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
    ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
    or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
    MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
    or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
    PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
    SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
    or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
    XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
    XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or
    FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
    Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
    CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string"
    SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string"
    RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
    Development or Study or Training or Other" AuditID="string" AuditPassword="string"
    xmlns="http://www.multispeak.org/Version_4.1_Release" />
  </soap12:Header>
  <soap12:Body>
    <InitiateMeterReadingsByMeterIDResponse xmlns="http://www.multispeak.org/Version_4.1_Release">
      <InitiateMeterReadingsByMeterIDResult>
        <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
        <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />
      </InitiateMeterReadingsByMeterIDResult>
    </InitiateMeterReadingsByMeterIDResponse>
  </soap12:Body>
</soap12:Envelope>

```

5.5 InitiateOutageDetectionEventRequest

5.5.1 Request

POST /content/multispeak/specifications/416/OD_Server.asmx HTTP/1.1

Host: multispeakorg.net

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

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

```
<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"      xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">
```

```
<soap12:Header>
```

```
<MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or
CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or
FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
CoordinateSystemAuthority="string"      CoordinateSystemAuthorityCode="string"      Datum="string"
SessionID="string"      PreviousSessionID="string"      ObjectsRemaining="integer"      LastSent="string"
RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
Development or Study or Training or Other" AuditID="string" AuditPassword="string"
xmlns="http://www.multispeak.org/Version_4.1_Release" />
```

```
</soap12:Header>
```

```

<soap12:Body>
  <InitiateOutageDetectionEventRequest xmlns="http://www.multispeak.org/Version_4.1_Release">
    <meterIDs>
      <meterID meterNo="string" serviceType="Electric or Gas or Water or Propane or Refuse or Sewer or
Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown"
objectID="string" utility="string" />
      <meterID meterNo="string" serviceType="Electric or Gas or Water or Propane or Refuse or Sewer or
Telecom or TV or Cable or Heating or Steam or Transportation or All or Other or Unknown"
objectID="string" utility="string" />
    </meterIDs>
    <requestDate>dateTime</requestDate>
    <responseURL>string</responseURL>
    <transactionID>string</transactionID>
    <expTime />
  </InitiateOutageDetectionEventRequest>
</soap12:Body>
</soap12:Envelope>

```

5.5.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/soap+xml; charset=utf-8
Content-Length: length

<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"    xmlns:soap12="http://www.w3.org/2003/05/soap-
envelope">
  <soap12:Header>
    <MultiSpeakMsgHeader      MajorVersion="integer"      MinorVersion="integer"      Build="integer"
Branch="integer" BuildString="PR or RC or Branch or Release or Other or Unknown" UserID="string"
Pwd="string" AppName="string" AppVersion="string" Company="string" DefaultCurrencyCode="USD or
EUR or AED or AFN or ALL or AMD or ANG or AOA or ARS or AUD or AWG or AZN or BAM or BBD or
BDT or BGN or BHD or BIF or BMD or BND or BOB or BOV or BRL or BSD or BTN or BWP or BYR or
BZD or CAD or CDF or CHE or CHF or CHW or CLF or CLP or CNY or COP or COU or CRC or CUP or

```

```

CVE or CZK or DJF or DKK or DOP or DZD or EEK or EGP or ERN or ETB or FJD or FKP or GBP or
GEL or GHS or GIP or GMD or GNF or GTQ or GYD or HKD or HNL or HRK or HTG or HUF or IDR or
ILS or INR or IQD or IRR or ISK or JMD or JOD or JPY or KES or KGS or KHR or KMF or KPW or KRW
or KWD or KYD or KZT or LAK or LBP or LKR or LRD or LSL or LTL or LVL or LYD or MAD or MDL or
MGA or MKD or MMK or MNT or MOP or MRO or MUR or MVR or MWK or MXN or MXV or MYR or MZN
or NAD or NGN or NIO or NOK or NPR or NZD or OMR or PAB or PEN or PGK or PHP or PKR or PLN or
PYG or QAR or RON or RSD or RUB or RWF or SAR or SBD or SCR or SDG or SEK or SGD or SHP or
SKK or SLL or SOS or SRD or STD or SYP or SZL or THB or TJS or TMM or TND or TOP or TRY or TTD
or TWD or TZS or UAH or UGX or USN or USS or UYU or UZS or VEF or VND or VUV or WST or XAF or
XAG or XAU or XBA or XBB or XBC or XBD or XCD or XDR or XFU or XOF or XPD or XPF or XPT or
XTS or XXX or YER or ZAR or ZMK or ZWD or ADF or ADP or ATS or BEF or CYP or DEM or ESP or
FIM or FRF or GRD or IEP or ITL or LUF or MCF or MTL or NLG or PTE or SIT or SML or VAL or XEU or
Other" CSUnits="feet or meters or USSurveyFeet or other" CoordinateSystemName="string"
CoordinateSystemAuthority="string" CoordinateSystemAuthorityCode="string" Datum="string"
SessionID="string" PreviousSessionID="string" ObjectsRemaining="integer" LastSent="string"
RegistrationID="string" MessageID="string" TimeStamp="dateTime" Context="Production or Testing or
Development or Study or Training or Other" AuditID="string" AuditPassword="string"
xmlns="http://www.multispeak.org/Version_4.1_Release" />

</soap12:Header>

<soap12:Body>

  <InitiateOutageDetectionEventRequestResponse
xmlns="http://www.multispeak.org/Version_4.1_Release">

    <InitiateOutageDetectionEventRequestResult>

      <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />

      <errorObject objectID="string" errorString="string" nounType="string" eventTime="dateTime" />

    </InitiateOutageDetectionEventRequestResult>

  </InitiateOutageDetectionEventRequestResponse>

</soap12:Body>

</soap12:Envelope>

```


6 Annex C Frequently Asked Questions

Q. What is the Use case/command to be used for updating firmware?

R. Multispeak 4.1 does not include firmware update process started by CIS or MDM. Firmware update is a process started and handled by HES.

Q. Elaborate with a high level view about the process of loading the meter to WAM after the shipment received in the store.

R. Loading meter to WAM process is not part of the MDM/SGG-HES integration.

Q. Is the MDM required in pre-paid Multispeak use cases?

R. From Multispeak official documentation: *"For the pre-paid metering use cases, it is particularly important to note that although a Meter Data Management system is shown in nearly all the use cases, such a system is not required to execute the use case and thus to be in compliance with the MultiSpeak specification"*.

Q. Please list the events code and descriptions expected to be notified.

R. From Multispeak official documentation: *"Event codes in MultiSpeak Version 4.1 should be chosen from among those specified in Annex E ("Recommended EndDeviceEvent category enumerations") to IEC 61968-9 Ed.1: Application integration at electric utilities – System interfaces for distribution management – Part 9: Interface for meter reading and control."*

Q. Please list the meter reading types expected.

R. From Multispeak official documentation: *"The definition of reading Type comes from Annex C of IEC 61968-9"*

Q. Is the customer info should be mandatory in HES as some HES will not store this info. Will the system depends on some customer info stored in the HES? Noting that this info exist in the XSD of MeterAddNotification.

R. No, the system does not depends on customer info stored in the HES.

Q. Please add business description for each filed in the WS

R. Please refer to official Multispeak documentation available at <https://multispeakorg.net>

Q. The list of use cases is not comprehensive to cover the scope of work of RFP1.

R. This document describes the integration between MDM/SGG and HES based on RFP2 requirements.

Q. Expected state in the HES is missing in this document.

R. HES processes are out of scope of this document and out of scope of RFP2.

Q. For scheduled operation is the file based integration the only way or the preferred way?

R. As per Multispeak specifications, is not the only way but is the way used by Oracle/SGG.

Q. Unix time is the number of seconds that have elapsed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January 1970?

R. Yes.