



Measured Central Management System Test Specification

Purpose

The purpose of this document is to specify the testing required for approval as a measured Central Management System (CMS) which utilises measured feedback. This test specification does not cover lighting Apparatus covered by the Central Management System Equivalent Meter Test Specification. It is intended for other technologies, as determined by accredited test agent, that it would not be appropriate to test using the existing CMS Equivalent Meter Test Specification.

The approved CMS must be used in conjunction with an approved Equivalent Meter (EM).

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1 Introduction

1.1 Scope

The functional requirements and responsibilities are set out in [BSCP520: Unmetered Supplies Registered in SMRS](#).

[BSCP520](#) includes functional requirements and responsibilities that cover:

- CMS data storage;
- Provision of data to the MA and Unmetered Supplies Operator (UMSO);
- Data validation and exception handling by the MA; and
- Application of default data by the MA.

This Test Specification covers the measured CMS tests that are required to be performed by an applicant, wishing to gain approval for use of a measured CMS as part of the overall EM, and the test evidence that should be provided to the accredited test agent, currently Balancing and Settlement Code Company (BSCCo), to demonstrate compliance with the requirements and responsibilities as per [BSCP520](#).

1.2 Approval Process

A new CMS is required by [BSCP520](#) to be approved by the Panel or its delegated authority, the Supplier Volume Allocation Group (SVG). As part of this process, the initial stages of which are managed by the Unmetered Supply User Group (UMSUG), a CMS will be tested against this specification. The UMSUG then makes a recommendation to the SVG as to whether the CMS should be approved for use.

This Test Specification aims to provide guidance to applicants by summarising the CMS requirements as specified in [BSCP520](#) in the Requirements Test Checklist ([Section 4](#)), along with the associated testing ([Section 5](#)) that is necessary in order to demonstrate compliance.

Approval would be demonstrated by the provision of test evidence gained in the process of running the specified tests to the UMSUG and SVG. Once approved, the details of the new CMS would be added to the approved list maintained by BSCCo, published on the [BSC Website](#).

In the case of material changes to software the measured CMS may need to go through this approval processes again.

1.3 Assumptions

The following assumptions have been made:

- This test specification does not cover the testing of the MA System;
- Some of the tests in this specification may need to be tailored to the specific type of Apparatus being tested, the accredited test agent will agree these test with the applicant; and
- The measured CMS applicant will make available the relationship between the measured CMS power consumption at the supply terminals to the unmetered supply and the measured CMS outputs to the accredited test agent.

2 Test Approach

The measured CMS functional requirements and responsibilities (as per [BSCP520](#)) have been mapped to System Requirement Test Checklists ([Section 4](#)). These Checklists will be used by the accredited test agent to ensure that the applicant has demonstrated compliance with all appropriate CMS requirements listed in [BSCP520](#).

Each test requirement has been given a test reference number, which can be traced back where applicable, to the relevant requirement in [BSCP520](#). Test References have been grouped into Test Groups with a summary of the tests and evidence required for each Test Group given in the Test Group Summary ([Section 5](#)).

The Test Group Summary ([Section 5](#)) has been provided as a guideline only. It is the applicant's responsibility to ensure that the tests run show compliance with each requirement listed in the System Requirements Test Checklists ([Section 4](#)), and that the test evidence has been collected in a clear and precise manner ([Section 6](#)).

It is expected that the accredited test agent will witness the execution of the tests run by the applicant at a test environment set up by the applicant.

3 Key Test Scenarios for Central Management Systems

This section contains a high level summary of the key test scenarios included in the Test Group Summary (Section 5). This section does not contain an exhaustive list of all scenarios tested. The applicant is advised to analyse the testing requirements based on all scenarios listed in the Test Group Summary (Section 5).

The key measured CMS test scenarios shall include, but will not be limited to, the following:

- Data security measures;
- Synchronisation to Universal Time Clock (UTC);
- The technical details of the measurement device to be used;
- The recording of Inventory and Equipment control information;
- The recording of operation switching times and power levels in line with the measured CMS instructions processed;
- The generation and making available of Operational Event logs in the specified format; and
- Provision of the necessary volume and performance test evidence, so as to provide assurance that the measured CMS can meet operational timescales.

In the scenarios below where the events cover a 24 hour period or more, the witness testing processes will be agreed between the applicant and the accredited test agent.

This test specification sets out six scenarios for the applicant to undertake and provide evidence to the accredited test agent:

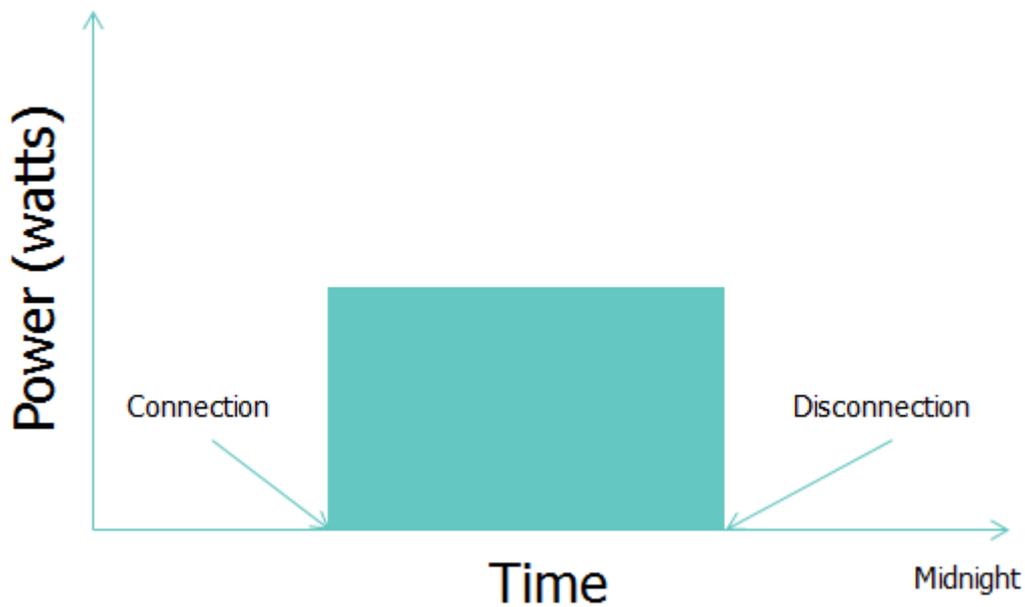
- Scenario 1 – On and Off test
- Scenario 2 – Two Events with Disconnection in Between
- Scenario 3 – No Connection, No Consumption
- Scenario 4 – Connection, No Consumption
- Scenario 5 – Consumption Over Midnight
- Scenario 6 – Communications failure

The detailed requirements for each scenario are set out below.

3.1 Scenario 1 – On and Off test

The Apparatus should be off to start with then connected and draw a steady load for over an hour. It should then be disconnected before midnight, the events should be stored within the CMS and an event log produced that demonstrates the on / off switching times and the percentage power across the duration of the events.

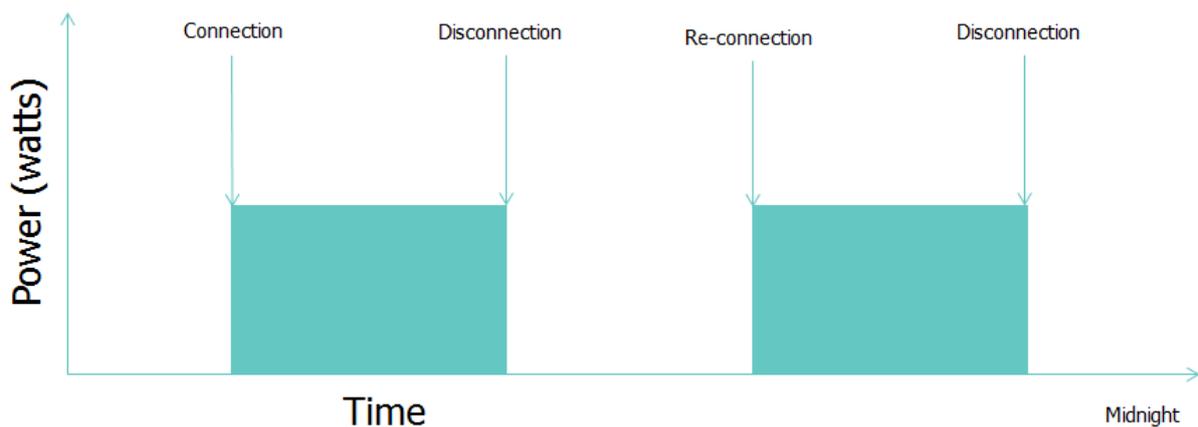
This test is designed to assess the accuracy of the energy calculation.



3.2 Scenario 2 – Two Events with Disconnection in Between

This scenario involves two events where the Apparatus is disconnected in between.

The Apparatus should be off to start with then connected and draw a steady load over a half hour interval. It should then be disconnected and stay off for an hour. It should then be reconnected and draw a load for over half an hour and then be disconnected before midnight. This should provide event logs reflecting that both events are accurately recorded.



The applicant must demonstrate that the on and off events and percentage load are accurately reflected in the event log. If the Apparatus has configurable load a scenario with variable load will be agreed with the accredited test agent.

NB Scenario 2 should be repeated and used as the communications failure model in Scenario 6.

3.3 Scenario 3 – No Connection, No Consumption

The Apparatus should not be connected for an entire day. The applicant must demonstrate that when no Apparatus is connected a zero event is produced in the event log.

3.4 Scenario 4 – Connection, No Consumption

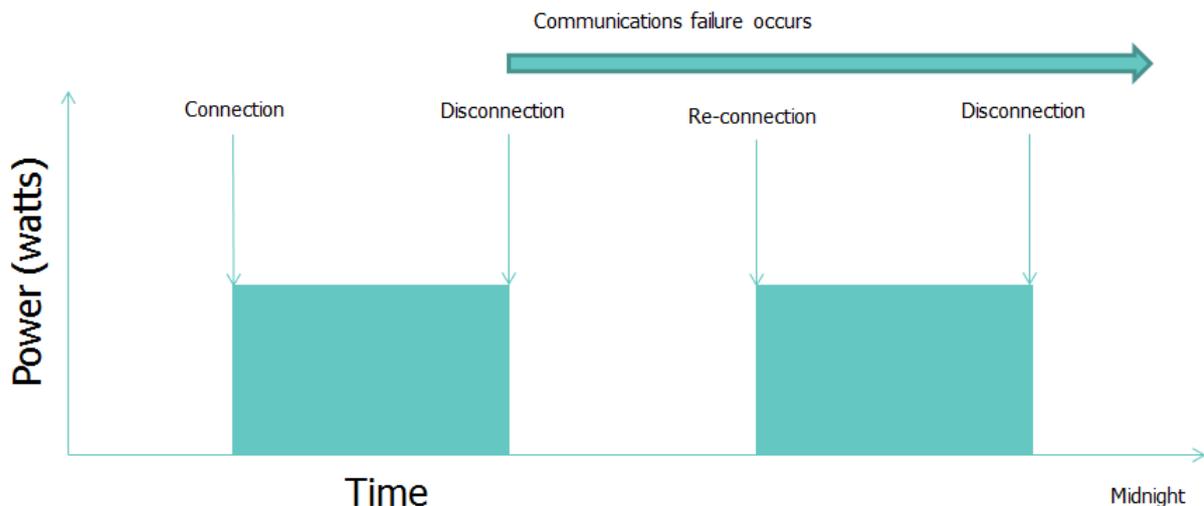
The Apparatus should be connected for an entire day but not consuming power. The applicant must demonstrate that when the Apparatus is connected but consuming zero power that a zero event is produced in the event log.

3.5 Scenario 5 – Consumption Over Midnight

In this scenario the Apparatus is connected and consuming power before midnight and continues to consumer power over the midnight boundary into the next day. The applicant must demonstrate that the Apparatus is still connected at midnight and records the correct event data, even though the consumption occurred the previous day. This test will require two event logs spanning the two consecutive days.

3.6 Scenario 6 – Communications Failure

The applicant must demonstrate that an accurate event log is maintained if there is a communications failure during part or all of the event log. This test scenario is a repeat of Scenario 2 with a communications failure replicated where the measured CMS system is unable to record and report power level recorded during the entirety of the second event.



The applicant must demonstrate that the readings sent for the first consumption event (before the communications failure) are included in the initial event log, whilst the later readings will not be included in the initial event log. Once the later readings have communicated then a subsequent event log should be produced with the revised consumption, showing both consumption periods, for the test day.

4 Requirements Test Checklist

This section provides a checklist of measured CMS System requirements. The applicant is expected to comply with these system requirements for approval as a measured CMS.

Where applicable each requirement has been allocated the appropriate [BSCP520](#) reference.

It is the applicant's responsibility to perform the appropriate tests in order to demonstrate compliance with all relevant system requirements.

The certified test agent will use the Test Checklist to monitor compliance of each requirement.

The appropriate default switch regime for the Apparatus will be agreed upon with the certified test agent on a product by product basis.

The MA requirements are not covered in this test specification, only that the applicant must demonstrate that the MA should be able to download and process the event logs.



Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 1	<u>Configuration Control</u>			
Test 1.1	CMS software version	Non-functional		
Test 1.2	CMS operating platform and version	Non-functional		
Test 1.3	The technical details of the measurement device to be used	Non-functional		
Test Group 2	<u>Synchronisation to UTC</u>	4.6.3.3(i)		

4.1.2 Data Input and Storage Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 3a	<u>Detailed Inventory information</u>			
Test 3.1	Add, delete, modify manually or electronically:	Functional		
Test 3.1.1	Road Reference	Functional		
Test 3.1.2	Town, Parish, District	Functional		
Test 3.1.3	Road Name	Functional		
Test 3.1.4	Location	Functional		
Test 3.1.5	Unit Type	Functional		
Test 3.1.6	Unit Identity	Functional		
Test 3.1.7	CMS Unit Reference	Functional		
Test 3.1.8	Charge Code	Functional		
Test 3.1.9	Number of Items	Functional		
Test 3.1.10	Switch Regime	Functional	Agreed default switch regime	
Test 3.1.11	Number of Controls	Functional		
Test 3.1.12	Control Charge Code	Functional		
Test 3.1.13	Ordinance Survey Grid ref 'East' or Latitude	Functional		
Test 3.1.14	Ordinance Survey Grid ref 'North' or Longitude	Functional		
Test 3.1.15	Exit Point	Functional	If appropriate	

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 3.2	Audit Trail	Functional		
Test Group 3b	<u>Inventory control information</u>			
Test 3.3	Add, delete, modify manually or electronically:	Functional		
Test 3.3.1	Sub-Meter ID	Functional		
Test 3.3.2	Effective From Date	Functional		
Test 3.3.3	CMS Unit Reference	Functional		
Test 3.3.4	Number of Items	Functional	This test only applies to Apparatus where more than one item is connected to a single CMS unit reference.	
Test 3.3.5	Switch Regime	Functional	Agreed default switch regime	
Test 3.3.6	Charge Code	Functional		
Test 3.4	Audit Trail	Functional		
Test Group 4	<u>Equipment control information</u>		This test group refers to the control device	
Test 4.1	Add, delete, modify manually or electronically	Functional		
Test 4.1.1	CMS Unit Reference	Functional		
Test 4.1.2	Sum of CMS Controller devices	Functional		
Test 4.1.3	Switch Regime	Functional	Agreed default switch regime	
Test 4.1.4	Charge Code	Functional		
Test 4.2	Audit Trail	Functional		

4.1.3 Process Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 5	<u>CMS Event Driven Measurement</u>		Where events are driven by the connection of Apparatus to an exit point	
Test 5.1	Scenario 1	4.5.2.3		
Test 5.2	Scenario 2	4.5.2.3		
Test 5.3	Scenario 3	4.5.2.3		
Test 5.4	Scenario 4	4.5.2.3		
Test 5.5	Scenario 5	4.5.2.3		
Test 5.6	Scenario 6	4.5.2.3		
Test Group 6	<u>Record operational switching times and power levels</u>		Events and power levels should be available via a user interface to the CMS	
Test 6.1	Record operational switching times for Scenarios 1 to 6	4.6.3.3(b) 4.6.3.3(c)		
Test 6.2	Audit Trail	4.6.3.3(h)		
Test Group 7	<u>Generate Operational Event Log</u>		Generate events for each scenario	
Test 7.1	Scenario 1	4.5.2.3		
Test 7.2	Scenario 2	4.5.2.3		
Test 7.3	Scenario 3	4.5.2.3		
Test 7.4	Scenario 4	4.5.2.3		
Test 7.5	Scenario 5	4.5.2.3		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 7.6	Scenario 6	4.5.2.3		
Test 7.7	Available daily and on request	4.6.6.3(b) 4.6.6.3(c)	Evidence the MA can get the file daily and on request	
Test 7.8	Audit Trail	4.6.6.3(h)		
Test Group 8	<u>Volume and Performance</u>			
Test 8.1	Compliance with operational timescales	Functional		

4.1.4 Data Output Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 9	<u>Operational Event Log</u>		Testing that the event log is in the correct format	
Test 10.1	File Format	4.6.6.3(c)		
Test 10.2	Filename	4.6.6.3(c)		
Test 10.3	Header identifier	4.6.6.3(c)		
Test 10.4	Sub-Meter ID	4.6.6.3(c)		
Test 10.5	Date	4.6.6.3(c)		
Test 10.6	Version	4.6.6.3(c)		
Test 10.7	CMS Unit reference	4.6.6.3(c)		
Test 10.8	Time	4.6.6.3(c)		
Test 10.10	Percentage of base power	4.6.6.3(c)		
Test 10.10	Information Flag	4.6.6.3(c)		
Test 10.11	Trailer	4.6.6.3(c)		



5 Test Group Summary

This section provides a guideline to the testing that should be performed and the test evidence that should be secured to demonstrate compliance with the CMS requirements as per the Requirements Checklist ([Section 4](#)).

Approval as a measured CMS would be demonstrated by the provision of test evidence to the UMSUG and SVG, gained in the process of running the tests specified in this section.

The applicant should secure test evidence in the format specified in [Section 6](#).

Test Group Ref	Test Requirement Overview	Test Evidence Overview
Test Group 1	<p><u>System Configuration</u> The operator of the CMS should demonstrate the software versioning and operating platforms that will be subject to approval.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • The software is subject to version control; • The software version and platform subject to approval have been noted.
Test Group 2	<p><u>Synchronisation to UTC</u> The operator of the CMS System should demonstrate that the CMS System is synchronised to UTC, either by connection to internet time servers or a radio clock, and are accurate to within ± 20 seconds.</p>	<ul style="list-style-type: none"> • Evidence that the CMS System is synchronised to UTC within ± 20 seconds.
Test Group 3	<p><u>Inventory control information</u> The operator of the CMS System should demonstrate the addition, modification and deletion of Inventory Control information required for the key test scenarios specified in Section 3, either manually or electronically. The Data subject to testing is:</p> <ul style="list-style-type: none"> • Sub-Meter ID • Effective From Data • CMS Unit Reference • Number of Items • Switch Regime • Charge Code <p>There is also a detailed inventory test that it is input, stored and amended correctly with an appropriate audit trail. Note this must also demonstrate where CMS operating in more than one Distribution Area, inventory information is assigned to the correct sub-meter ID.</p>	<p>No Evidence is required for the Test Group however the applicant should inform the certified test agent of the data required for the Test Scenarios described in Section 3.</p>
Test Group 4	<p><u>Equipment control information</u> If applicable the operator of the measured CMS should demonstrate the addition, modification and deletion of Equipment Control information required for the Scenarios described in Section 3, either manually or electronically.</p>	<p>No Evidence is required for the Test Group however the applicant should inform the certified test agent of the data required for the Test Scenarios described in Section 3.</p>

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>The Data subject to testing is:</p> <ul style="list-style-type: none"> • CMS Unit Reference • Sum of CMS Controller devices • Switch Regime • Charge Code 	
Test Group 5	<p><u>CMS Event Driven Measurement</u> The operator of the measured CMS should demonstrate event driven measurement of operational switching times and recorded power consumption for CMS Units in the CMS System for the Scenarios 1 to 6. Details of the scenarios subject to testing are given in Section 3. If applicable a measurement should be produced indicating that there has been connection/disconnection or change in power level.</p>	<ul style="list-style-type: none"> • Evidence that the measurements were successful in the response of an event, except for the control failure where the necessary business processes or local working instruction were followed showing the operational procedures taken for fault correction to allow for revised measurements the following days. • If applicable, evidence that the measurement in response to the event is correct.
Test Group 6	<p><u>Record operational switching times and power levels</u> The operator of the CMS System should demonstrate the recording of operational switching times and power levels for CMS Units in the CMS System for the Scenarios 1 to 6. Details of the scenarios subject to testing are given in Section 3. The operator of the CMS System should demonstrate the audit trail for the above scenarios.</p>	<ul style="list-style-type: none"> • Evidence that the data recorded is correctly in the CMS; • Evidence that the audit trail is correct.
Test Group 7	<p><u>Generate Operational Event Log - normal processing and communications failure</u> The operator of the measured CMS should demonstrate that the daily operational event logs of the operational switching times and power levels for specified measured CMS are able to be downloaded by the MA in the specified format for the Scenarios 1 to 6.</p> <p>The operator of the CMS should demonstrate a communications failure (no data for a CMS Unit).</p> <p>Operational Event Log – revision to previously reported data</p>	<p>The CMS operator must provide evidence that:</p> <ul style="list-style-type: none"> • The operational event logs have been successfully created; • The operational event log values are correct; • The operational event logs are sent on a daily basis • The operation event logs are in the specified file format (See Test Group 9) • The audit trail is correct and the operational event logs have been retained for audit purposes

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>The operator of the CMS should demonstrate that data can be revised by either issuing a refresh or an incremental operational event log in the specified format (Scenario 6). The Refresh or Incremental Flow should cover:</p> <ul style="list-style-type: none"> • Refresh Flow <ul style="list-style-type: none"> ○ A complete refresh of the operational event logs which includes previously unknown data; ○ A complete refresh of the operational event logs which includes data which has been amended. • Incremental Flow <ul style="list-style-type: none"> ○ An incremental update of operational event log which includes previously unknown data; ○ An incremental update of operational event log which includes data which has been amended. <p>Details of the scenarios subject to testing are given in Section 3 The CMS operator should demonstrate that the operational event logs can be produced for the Scenarios above for audit and testing purposes.</p>	
Test Group 8	<p>Volume and Performance The operator of the CMS System should provide tests evidence of volume and performance tests completed by the applicant as part of their system testing, to the accredited test agent so that compliance with operational timescales can be accessed.</p>	Evidence of volume and performance tests provided to the accredited test agent.
Test Group 9	<p>Operational Event Log – File format The operator of the CMS System should demonstrate that the operational event logs are in the specified format as per BSCP520 Section 4.6.6.3(c).</p>	<p>Evidence that the operational event logs are in the correct format including the Filename, Trailer and the following key data fields:</p> <ul style="list-style-type: none"> • Header identifier • Sub-Meter ID • Date • Version • CMS Unit reference • Time • Percentage of base power • Information Flag

6 Recording Test Results

It is the applicants' responsibility for recording tests result in the format specified below. Evidence should be secured for each Test Reference listed in the Requirement Test Checklist ([Section 4](#)). Evidence guidelines are given for each Test Group in the Test Group Summary ([Section 5](#)). The applicant should capture evidence in accordance with these guidelines.

The following convention should be used for labelling evidence where possible:

<System>_<Test Group>_<Run Date>_<Run Number>_<Test Reference>

For example, the reference CMS_Test Group2_250408_1_Test 2.3 should be recorded on the top of each piece of evidence associated with the following test:

Test System: Central Management System

Test Group: 2

Run Date: 25-04-2008

Run Number: 1

Test Ref: 2.3

Test to check the system security of the measured CMS for the Customer.

Appendix A – Terms used in this Document

Other acronyms and defined terms take the meanings defined in the Balancing and Settlement Code (the Code), Section X.

Acronym/Term	Definition
CMS	Central Management System
EM	Equivalent Meter
MA	Meter Administrator
MOA	Meter Operator Agent
UMSO	Unmetered Supplies Operator
SVG	Supplier Volume Allocation Group
UMSUG	Unmetered Supply User Group
UTC	Co-ordinated Universal Time

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