



Central Management System Equivalent Meter Test Specification

Prepared by ELEXON Limited

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For Attention Of	BSC Parties and other interested parties			
Overview or Purpose of Document:				
The purpose of this document is to specify the testing required for approval as a Central Management System Equivalent Meter.				
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1 Introduction

1.1 Scope

Change Proposal CP1196 (Changes to incorporate Central Management Systems in Unmetered Supplies arrangements), formalised the use of a Central Management System (CMS) as part of the overall Equivalent Meter (EM), with the relevant CMS and Meter Administrator (MA) system, functional requirements and responsibilities being set out in BSCP520 'Unmetered Supplies Registered in SMRS'. CP1196 was implemented on 26 February 2008.

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;
- Application of default data by the MA; and
- Provision of data to the Half Hourly Data Collector (HHDC).

This Test Specification covers the CMS and MA System tests that are required to be performed by an applicant, wishing to gain approval for use of a CMS as part of the overall EM, and the test evidence that should be provided to the accredited test agent, currently BSCCo, to demonstrate compliance with the requirements and responsibilities as per BSCP520.

1.2 Approval Process

All new EMs are 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), EMs are tested against the requirements of an EM specification in BSCP520 to ensure they are fit for purpose. The UMSUG then makes a recommendation to the SVG as to whether the EM should be approved for use.

A new testing and approval process has been introduced for EMs comprising a CMS. Under this approach, an applicant would commission an accredited test agent, currently BSCCo, who would evaluate the hardware and software against the EM requirements specified in BSCP520.

This Test Specification aims to provide guidance to applicants by summarising the EM requirements as specified in BSCP520 in the Requirements Test Checklist ([Section 5](#)), along with the associated testing ([Section 6](#)) 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 EM would be added to an Approved Equivalent Meters List maintained by BSCCo, published on the website.

1.3 Assumptions

The following assumptions have been made:

- New MAs are required to undergo Qualification in accordance with BSCP537 'Qualification Process for SVA Parties, SVA Party Agents and CVA MOAs, before operating in the market and before undergoing Central Management System EM approval;
- If an existing MA chooses to make use of a CMS-based EM, the changes required to the participant's systems and processes may trigger a requirement for re-qualification. The MA will determine whether they need to re-qualify in this circumstance. BSCCo can provide guidance on this matter where required;
- The CMS may be operated by the MA or the Customer; however the MA retains the overall Settlement responsibility for the quality of the data submitted by the Customer via the CMS and the MA System; and
- The CMS EM applicant will make available the relationship between the CMS functionality and power consumption at the supply terminals to the unmetered supply, to the accredited test agent, currently BSCCo. For e.g. the ratio of the lamp dimming percentage level to power consumption percentage level is 1:1. Approval of Charging Codes and associated power levels is obtained through UMSUG.

2 Test Approach

The CMS and MA system functional requirements and responsibilities (as per BSCP520) have been mapped to System Requirement Test Checklists ([Section 5](#)). These Checklists will be used by the accredited test agent, currently BSCCo, to ensure that the applicant has demonstrated compliance with all CMS and MA system 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 6](#)).

The Test Group Summary ([Section 6](#)) 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 5](#)), and that the test evidence has been collected in a clear and precise manner ([Section 7](#)).

It is expected that the accredited test agent will witness the execution of the tests run by the applicant at the applicant's premises.

It should be noted that functionality may differ slightly where the CMS and the MA systems are combined into a single application. However, overall functional requirements remain the same. The Test Group Summary ([Section 6](#)) details where functionality may differ.

3 Test Environment and Data Requirements

It is the applicant's responsibility to provide the necessary test environments and data required to demonstrate compliance as per BSCP520, and to meet the requirements of all the key test scenarios given below ([Section 4](#)) and those in the Test Group Summary ([Section 6](#)).

Where the MA System is being tested in isolation it will be the applicant's responsibility to secure or create the operational event logs or operational event log data that meet the appropriate scenario requirements.

4 Key Test Scenarios

This section contains a high level summary of the key test scenarios included in the Test Group Summary ([Section 6](#)). 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 6](#)).

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

- Data security measures;
- Synchronisation to Universal Time Clock (UTC);
- The recording of Inventory and Equipment control information;
- The issuing of CMS instructions for Scenarios 1 to 4 detailed below;
- The recording of operation switching times and power levels in line with the CMS instructions processed;

- The generating and sending 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 CMS can meet operational timescales.

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

- MA qualification under BSCP537;
- Data security measures;
- Synchronisation to UTC;
- The recording of Inventory and Equipment control information;
- The receipt and processing of Operational Event logs for Scenarios 1 to 4 detailed below;
- The validation and error processing of Inventory and Equipment control information;
- The validation and error processing of Operational Event logs;
- The calculation of kWh and kVAh for Scenarios 1 to 4 detailed below;
- The generating and sending of the Equivalent Meter Output Report in the correct format;
- The generating and sending of CMS Unit Exception Reports; and
- The ad-hoc generating and sending of Operational data.

4.1 Scenario 1 – Switch Regime 999

Scenario 1 covers an unmetered supply, (CMS Unit Reference) with a switch regime of 999 (dusk to dawn). The test coverage will encompass dimming in half hour increments as specified in the table below. The unmetered supply should be automatically turned on at dusk and off at dawn.

Event	Time On/Off	Dimming	Duration
1	At Dusk (automatic)	100%	30 min
2	After 30 min	75 %	For 90 min
3	After 120 min	50 %	Till 3 hours before dawn
4	3 hours before dawn	75%	For 60 min
5	2 hours before dawn	100%	Till Dawn
6	At Dawn (automatic)	0%	Off

Where a CMS does not support dimming, but only on/off switching, the applicant will be expected to demonstrate only those events that meet the CMS functionality being tested. Scenario 1 would therefore be adapted as follows:

Event	Time On/Off	Dimming	Duration
1	At Dusk (automatic)	100%	Till Dawn
2	At Dawn (automatic)	0%	Off

4.2 Scenario 2 – Switch Regime 998

Scenario 2 covers an unmetered supply (CMS Unit Reference) with a switch regime of 998 (continuous burning). The unmetered supply should be running at full load with dimming applied in half hour increments as per the table below with the final instruction returning the unmetered supply to one running at full load. It must also demonstrate that the device is already on, even though the instruction full power; will have been given (a few days ago) in the past and is being recorded as such.

Event	Time On/Off	Dimming	Duration
1	Continuous burning	100%	For 60 min
2	After 60 min	75 %	For 30 min
3	After 90 min	50 %	For 90 min
4	After 180 min	0%	For 30 min
5	After 210 min	50%	For 90 min
6	After 300 min	75 %	30 min
7	After 330 min	100 %	Continuous burning

It should be noted that the Dimming indicated above refers to the instruction made via the CMS Application and may not necessary equate to a percentage of actual power. The CMS applicant should report the relationship between CMS functionality and power consumption at the supply terminals to the unmetered supply, to the accredited test agent prior to testing. For example, the ratio of the lamp dimming percentage level to power consumption percentage level is 1:1. Approval of Charging Codes and associated power levels is obtained through UMSUG.

In the circumstance that the CMS under approval is unable to process the number of events in a 24 hour period, the scenarios will be agreed between the applicant and the accredited test agent, currently BSCCo.

The MA System shall be expected to calculate accurate half hourly consumption for Scenarios 1 and 2.

As with Scenario 1, where a CMS does not support dimming, but only on/off switching, the applicant will be expected to demonstrate only those events that meet the CMS functionality being tested. Scenario 2 would therefore be adapted as follows:

Event	Time On/Off	Dimming	Duration
1	Continuous burning	100%	For 180 min
2	After 180 min	0%	For 150 min
3	After 330 min	100 %	Continuous burning

4.3 Scenario 3 – Control Failure for multiple CMS Unit References

The applicant should reproduce a control failure where the CMS System is unable to record and report the power level set for multiple unmetered supplies.

The coverage required is:

- unmetered supply for a single Settlement Day with a Switch Regime of 999;
- unmetered supply for a single Settlement Day with a Switch Regime of 998;
- unmetered supply for a range of Settlement Days with a Switch Regime of 999; and
- unmetered supply for a range of Settlement Days with a Switch Regime of 998.

The unmetered supply CMS Unit Reference should be recorded on the CMS database and included in an operational event log. The failure should be noted by use of the correct information flag.

The MA System shall be expected to apply default data representative of the Switch Regime indicated in the control information file.

4.4 Scenario 4 – Revised Data after Control Failure (following day)

The applicant should demonstrate that data can be revised the next day for a previous control failure (Scenario 3). The revised data is reported either by issuing a refresh or an incremental operational event log for separate MA and CMS Systems, or if applicable, transferring the revised operational event data where the MA and CMS Systems are integrated.

The Refresh or Incremental Flow should cover:

- Previously unknown data; and
- Data which has been amended.

The MA System shall be expected to calculate accurate half hourly consumption once the data from the previous days has become available.

5 Requirements Test Checklist

This section provides a checklist of CMS and MA System requirements. The applicant is expected to comply with these system requirements for approval as a Central Management System Equivalent Meter.

Where applicable each requirement has been allocated the appropriate BSCP520 reference.

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 6](#)). It should be noted that the Test Group Summary provides a guideline only. It is the applicant's responsibility to perform the appropriate tests in order to demonstrate compliance with all relevant system requirements.

Where the CMS and MA Systems are combined into a single application, all requirements shall apply unless otherwise stated in the Test Group Summary.

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

5.1 Central Management System

5.1.1 System Requirements

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 Group 2	<u>System Security</u>			
Test 2.1	HHDC	4.5.2.3 (i)		
Test 2.2	Suppliers	4.5.2.3 (i)		
Test 2.3	Customers	4.5.2.3 (i)		
Test 2.4	MA	Functional		
Test Group 3	<u>Synchronisation to UTC</u>	4.5.2.3 (k)		

5.1.2 Data Input and Storage Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 4a	<u>Detailed Inventory information</u>			
Test 4.1	Add, delete, modify manually or electronically:	Functional		
Test 4.1.1	Road Reference	Functional		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 4.1.2	Town, Parish, District	Functional		
Test 4.1.3	Road Name	Functional		
Test 4.1.4	Location	Functional		
Test 4.1.5	Unit Type	Functional		
Test 4.1.6	Unit Identity	Functional		
Test 4.1.7	CMS Unit Reference	Functional		
Test 4.1.8	Charge Code	Functional		
Test 4.1.9	Number of Items	Functional		
Test 4.1.10	Switch Regime	Functional		
Test 4.1.11	Number of Controls	Functional		
Test 4.1.12	Control Charge Code	Functional		
Test 4.1.13	Ordinance Survey Grid ref 'East' or Latitude	Functional		
Test 4.1.14	Ordinance Survey Grid ref 'North' or Longitude	Functional		
Test 4.1.15	Exit Point	Functional		
Test 4.2	Audit Trail	Functional		
Test Group 4b	<u>Inventory control information</u>			
Test 4.3	Add, delete, modify manually or electronically:	Functional		
Test 4.3.1	Sub-Meter ID	Functional		
Test 4.3.2	Effective From Date	Functional		
Test 4.3.3	CMS Unit Reference	Functional		
Test 4.3.4	Number of Items	Functional		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 4.3.5	Switch Regime	Functional		
Test 4.3.6	Charge Code	Functional		
Test 4.4	Audit Trail	Functional		
Test Group 5	<u>Equipment control information</u>			
Test 5.1	Add, delete, modify manually or electronically	Functional		
Test 5.1.1	CMS Unit Reference	Functional		
Test 5.1.2	Sum of CMS Controller devices	Functional		
Test 5.1.3	Switch Regime	Functional		
Test 5.1.4	Charge Code	Functional		
Test 5.2	Audit Trail	Functional		

5.1.3 Process Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 6	<u>CMS Issue Instructions</u>			
Test 6.1	Scenario 1 - Switch Regime 999	4.5.2.3 (b)		
Test 6.2	Scenario 2 - Switch Regime 998	4.5.2.3 (b)		
Test 6.3	Scenario 3 - Control Failure	4.5.2.3 (b)		
Test 6.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (b) 4.5.2.3 (c)		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 6.5	Receive Response (optional)	Functional		
Test Group 7	<u>Record operational switching times and power levels</u>			
Test 7.1	Scenario 1 - Switch Regime 999	4.5.2.3 (b) 4.5.2.3 (c)		
Test 7.2	Scenario 2 - Switch Regime 998	4.5.2.3 (b) 4.5.2.3 (c)		
Test 7.3	Scenario 3 - Control Failure	4.5.2.3 (b) 4.5.2.3 (c)		
Test 7.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (b) 4.5.2.3 (c)		
Test 7.5	Audit Trail	4.5.2.3 (j)		
Test Group 8	<u>Generate Operational Event Log</u>			
Test 8.1	Scenario 1 - Switch Regime 999	4.5.2.3 (b) 4.5.2.3 (c)		
Test 8.2	Scenario 2 - Switch Regime 998	4.5.2.3 (b) 4.5.2.3 (c)		
Test 8.3	Scenario 3 - Control Failure	4.5.2.3 (b) 4.5.2.3 (c)		
Test 8.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (c)		
Test 8.5	Available daily (Separate CMS and MA System)	4.5.2.3 (b)		
Test 8.6	On Request (Integrated CMS and MA System)	4.5.2.3 (c)		
Test 8.7	Audit Trail	4.5.2.3 (j)		
Test Group 9	<u>Volume and Performance</u>			
Test 9.1	Compliance with operational timescales	Functional		

5.1.4 Data Output Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 10	<u>Operational Event Log</u>			
Test 10.1	File Format	4.5.2.3 (c)		
Test 10.2	Filename	4.5.2.3 (c)		
Test 10.3	Header identifier	4.5.2.3 (c)		
Test 10.4	Sub-Meter ID	4.5.2.3 (c)		
Test 10.5	Date	4.5.2.3 (c)		
Test 10.6	Version	4.5.2.3 (c)		
Test 10.7	CMS Unit reference	4.5.2.3 (c)		
Test 10.8	Time	4.5.2.3 (c)		
Test 10.10	Percentage of base power	4.5.2.3 (c)		
Test 10.10	Information Flag	4.5.2.3 (c)		
Test 10.11	Trailer	4.5.2.3 (c)		

5.2 Meter Administrator System

5.2.1 System Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 1	<u>MA Certification</u>			
Test 1.1	MA System must be operated by a MA qualified under BSCP537	4.5.2.3		
Test 1.2	MA System must fulfil the functions of a passive meter	4.5.2.3 4.5.2.1		
Test 1.3	MA System add, delete and modify summary inventory	4.5.2.1 (b)		
Test Group 2	<u>Configuration Control</u>			
Test 2.1	MA software version	Non-functional		
Test 2.2	MA operating platform and version	Non-functional		
Test Group 3	<u>System Security</u>			
Test 3.1	HHDC	4.5.2.3 (i)		
Test 3.2	Suppliers	4.5.2.3 (i)		
Test 3.3	Customers	4.5.2.3 (i)		
Test Group 4	<u>Synchronisation to UTC</u>	4.5.2.3 (k)		

5.2.2 Data Input and Storage Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 5	<u>Inventory control information</u>			
Test 5.1	Add, delete, modify manually:	4.5.2.3 (a)		
Test 5.1.1	Sub-Meter ID	4.5.2.3 (a)		
Test 5.1.2	Effective From Data	4.5.2.3 (a)		
Test 5.1.3	CMS Unit Reference	4.5.2.3 (a)		
Test 5.1.4	Number of Items	4.5.2.3 (a)		
Test 5.1.5	Switch Regime	4.5.2.3 (a)		
Test 5.1.6	Charge Code	4.5.2.3 (a)		
Test 5.2	Audit Trail	4.5.2.3 (j)		
Test 5.3	Add, delete, modify electronically:	4.5.2.3 (a)		
Test 5.3.1	Sub-Meter ID	4.5.2.3 (a)		
Test 5.3.2	Effective From Data	4.5.2.3 (a)		
Test 5.3.3	CMS Unit Reference	4.5.2.3 (a)		
Test 5.3.4	Number of Items	4.5.2.3 (a)		
Test 5.3.5	Switch Regime	4.5.2.3 (a)		
Test 5.3.6	Charge Code	4.5.2.3 (a)		
Test 5.4	File format	4.5.2.3 (a)		
Test 5.5	Audit Trail	4.5.2.3 (j)		
Test Group 6	<u>Equipment control information</u>			
Test 6.1	Add, delete, modify manually	4.5.2.3 (a)		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 6.1.1	CMS Unit Reference	4.5.2.3 (a)		
Test 6.1.2	Sum of CMS Controller devices	4.5.2.3 (a)		
Test 6.1.3	Switch Regime	4.5.2.3 (a)		
Test 6.1.4	Charge Code	4.5.2.3 (a)		
Test 6.2	Audit Trail	4.5.2.3 (j)		
Test 6.3.	Add, delete, modify electronically	4.5.2.3 (a)		
Test 6.3.1	CMS Unit Reference	4.5.2.3 (a)		
Test 6.3.2	Sum of CMS Controller devices	4.5.2.3 (a)		
Test 6.3.3	Switch Regime	4.5.2.3 (a)		
Test 6.3.4	Charge Code	4.5.2.3 (a)		
Test 6.4	File format	4.5.2.3 (a)		
Test 6.5	Audit Trail	4.5.2.3 (j)		
Test Group 7	<u>Operational Event Log</u>			
Test 7.1	Scenario 1 - Switch Regime 999	4.5.2.3 (d)		
Test 7.2	Scenario 2 - Switch Regime 998	4.5.2.3 (d)		
Test 7.3	Scenario 3 - Control Failure	4.5.2.3 (g)		
Test 7.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (h)		
Test 7.5	CMS Unit Reference	4.5.2.3 (b)		
Test 7.6	Time and Date	4.5.2.3 (b)		
Test 7.7	Power level (Percentage)	4.5.2.3 (b)		
Test 7.8	Charge Code	4.5.2.3 (b)		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 7.9	Control Failure Information Flag	4.5.2.3 (b)		
Test 7.10	Received daily	4.5.2.3 (b)		
Test 7.11	Format	4.5.2.3 (c)		
Test 7.12	Audit Trail	4.5.2.3 (j)		

5.2.3 Process Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 8	<u>Validation - Inventory control information</u>			
Test 8.1	Filename	4.5.2.3 (a)		
Test 8.2	File header identifier	4.5.2.3 (a)		
Test 8.3	Sub-Meter Id	4.5.2.3 (a)		
Test 8.4	Effective From Date	4.5.2.3 (a)		
Test 8.5	Version number	4.5.2.3 (a)		
Test 8.6	CMS Unit Reference	4.5.2.3 (a)		
Test 8.8	Number of Items	4.5.2.3 (a)		
Test 8.8	Switch Regime	4.5.2.3 (a)		
Test 8.9	Charge Code	4.5.2.3 (a)		
Test 8.10	Trailer	4.5.2.3 (a)		
Test Group 9	<u>Validation - Equipment control information</u>			
Test 9.1	CMS Unit Reference	4.5.2.3 (a)		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 9.2	Sum of CMS Controller devices	4.5.2.3 (a)		
Test 9.3	Switch Regime	4.5.2.3 (a)		
Test 9.4	Charge Code	4.5.2.3 (a)		
Test Group 10	<u>Validation – Operational event log</u>			
Test 10.1	Filename	4.5.2.3 (c)		
Test 10.2	Header identifier	4.5.2.3 (c)		
Test 10.3	Sub-Meter ID	4.5.2.3 (c)		
Test 10.4	Date	4.5.2.3 (c)		
Test 10.5	Version	4.5.2.3 (c)		
Test 10.6	CMS Unit reference	4.5.2.3 (c)		
Test 10.7	Time	4.5.2.3 (c)		
Test 10.8	Percentage of base power	4.5.2.3 (c)		
Test 10.10	Information Flag	4.5.2.3 (c)		
Test 10.10	Trailer	4.5.2.3 (c)		
Test Group 11	<u>Calculating kWh</u>			
Test 11.1	Scenario 1 - Switch Regime 999	4.5.2.3 (d)		
Test 11.2	Scenario 2 - Switch Regime 998	4.5.2.3 (d)		
Test 11.3	Scenario 3 - Control Failure	4.5.2.3 (g)		
Test 11.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (h)		
Test 11.5	Audit Trail	4.5.2.3 (j)		
Test Group 12	<u>Calculating kVArh</u>			

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test 12.1	Scenario 1 - Switch Regime 999	4.5.2.3 (d)		
Test 12.2	Scenario 2 - Switch Regime 998	4.5.2.3 (d)		
Test 12.3	Scenario 3 - Control Failure	4.5.2.3 (g)		
Test 12.4	Scenario 4 – Revised Data after control failure (following day)	4.5.2.3 (h)		
Test 12.5	Audit Trail	4.5.2.3 (j)		

5.2.4 Data Output Requirements

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
Test Group 13	<u>Equivalent Meter Output Report</u>			
13.1	Submit to correct HHDC	BSCP537 4.5.2.3 (e)		
13.2	Submit Revision to correct HHDC	BSCP537 4.5.2.3 (h)		
13.3	Format	4.5.2.3 (e) 4.5.3		
Test Group 14	<u>CMS Unit Exception List</u>			
14.1	CMS Unit References	4.5.2.3 (f)		
14.2	Reported on the day	4.5.2.3 (f)		
14.3	Monthly distribution - UMSO	4.5.2.3 (f)		
14.4	Monthly distribution - Customer	4.5.2.3 (f)		
14.5	Upon request - UMSO	4.5.2.3 (f)		

Test Ref	Requirement / Details	Requirement Reference	Comment	Complies
14.6	Upon request Customer	4.5.2.3 (f)		
Test Group 15	<u>Ad-hoc extracts - Operational event data</u>			
15.1	On request - LDSO	PSL170 1.4.1.18		

6 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 and MA System requirements as per the Requirements Checklist ([Section 5](#)).

Approval as a Central Management System EM 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.

It should be noted that it is the applicant's responsibility to perform the appropriate tests in order to demonstrate compliance of all relevant system requirements.

Functionality may differ slightly where the CMS and the MA systems are combined into a single application, however overall functional requirements remain the same. Each Test Group will detail where functionality may differ.

The applicant should secure test evidence in the format specified in [Section 7](#).

6.1 Central Management System

Test Group Ref	Test Requirement Overview	Test Evidence Overview
Test Group 1	<p><u>System Configuration</u></p> <p>The operator of the CMS System 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>Security</u></p> <p>The operator of the CMS System should demonstrate the procedures which provide secure access to data. Operators should only be able to access data which is</p>	<ul style="list-style-type: none"> • Evidence that data is secure and that only relevant data can be accessed by the appropriate participant.

Test Ref	Group	Test Requirement Overview	Test Evidence Overview
		<p>relevant to them. Secure access procedures should be demonstrated for the following participants:</p> <ul style="list-style-type: none"> • HHDC • Suppliers • Customers 	
Test Group 3	<p><u>Synchronisation to UTC</u></p> <p>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 per month.</p>	<ul style="list-style-type: none"> • Evidence that the CMS System is synchronised to UTC within ± 20 seconds per month. 	
Test Group 4	<p><u>Inventory control information</u></p> <p>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 4, either manually or electronically.</p> <p>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 4.</p>	

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>The operator of the MA System should demonstrate the recording of the audit trail for the entries made above.</p>	
Test Group 5	<p><u>Equipment control information</u></p> <p>If applicable the operator of the CMS System should demonstrate the addition, modification and deletion of Equipment Control information required for the Scenarios described in Section 4, either manually or electronically.</p> <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 <p>The operator of the MA System should demonstrate the recording of the audit trail for the entries made above.</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 4.</p>
Test Group 6	<p><u>CMS Issue Instructions</u></p> <p>The operator of the CMS System should demonstrate the issuing of operational switching times and power level instructions for CMS Units in the CMS System for the following scenarios:</p> <ul style="list-style-type: none"> • Scenario 1 – Switch Regime 999; • Scenario 2 – Switch Regime 998; • Scenario 3 – Control Failure (no data for a CMS Unit); • Scenario 4 - Revised Data after control failure (following day). <p>Details of the scenarios subject to testing are given in Section 4.</p>	<ul style="list-style-type: none"> • Evidence that the instructions were successful, 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 a revised instruction the following day. • If applicable, evidence that the response to the instructions is correct.

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	If applicable a response should be received indicating that the instruction has been successful or unsuccessful.	
Test Group 7	<p><u>Record operational switching times and power levels</u></p> <p>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 following scenarios:</p> <ul style="list-style-type: none"> • Scenario 1 – Switch Regime 999; • Scenario 2 – Switch Regime 998; • Scenario 3 – Control Failure (no data for a CMS Unit); • Scenario 4 - Revised Data after control failure (following day) <p>Details of the scenarios subject to testing are given in Section 4.</p> <p>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 correct for the instruction processed; • Evidence that the audit trail is correct.
Test Group 8	<p><u>Generate Operational Event Log - normal processing and control failure</u></p> <p>The operator of the CMS System should demonstrate:</p> <p>The sending of a daily operational event logs (CMS and MA Separate Systems) or if applicable transferring of data (CMS and MA integrated Systems) of the operational switching times and power levels for specified CMS Units to the MA in the specified format for the following scenarios:</p> <ul style="list-style-type: none"> • Scenario 1 – Switch Regime 999; • Scenario 2 – Switch Regime 998; • Scenario 3 – Control Failure (no data for a CMS Unit); • Scenario 4 - Revised Data after control failure (following day) 	<p>Where the CMS and MA are separate Systems 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 Ref	Group	Test Requirement Overview	Test Evidence Overview
	<p>The operator of the CMS system should demonstrate a control failure (no data for a CMS Unit) through use of the correct information flag as per Scenario 3.</p> <p>Operational Event Log – revision to previously reported data</p> <p>The operator of the CMS System should demonstrate that data can be revised by either issuing a refresh or an incremental operational event log (CMS and MA Separate Systems) to the MA in the specified format or if applicable the transferring of revised data (CMS and MA integrated System) from a previous control failure. (Scenario 3) 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 4</p> <p>Where the CMS and MA are separate System the operator should demonstrate that the operational event log has been retained for audit purposes and the audit trail is correct.</p>	<p>Where the CMS and MA are an integrated System evidence that:</p> <ul style="list-style-type: none"> • The operational event log values transferred are correct; • The operational event values are transferred on a daily basis • The audit trail is correct; • The operational event logs can be successfully created for audit and testing purposes; • The operation event logs are in the specified file format (See Test Group 9). 	

Test Ref	Group	Test Requirement Overview	Test Evidence Overview
		Where the CMS and MA are integrated Systems the operator should demonstrate that the operational event logs can be produced for the Scenarios above for audit and testing purposes.	
Test Group 9	<p>Volume and Performance</p> <p>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 10	<p>Operational Event Log – File format</p> <p>The operator of the CMS System should demonstrate that the operational event logs are in the specified format as per BSCP520 Section 4.5.2.3 (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 	

6.2 Meter Administrator System

Test Group Ref	Test Requirement Overview	Test Evidence Overview
Test Group 1	<p><u>MA Certification BSCP537 - Key requirements</u></p> <p>The MA System must be operated by a Meter Administrator qualified under BSCP537 and can therefore:</p> <ul style="list-style-type: none"> • Fulfil the functions of a passive meter, e.g. defaulting data. • Add, delete and modify summary inventory. <p>The MA should add summary inventory information so as to meet the data requirements for the Scenarios detailed in Section 4.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • The applicant qualifying as a Central Management System EM has previously qualified as a Meter Administrator.
Test Group 2	<p><u>Configuration control</u></p> <p>The operator of the MA system 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 3	<p><u>Security</u></p> <p>The operator of the MA System should demonstrate the procedures which provide secure access to data. Operators should only be able to access data which is relevant to them. Secure access procedures should be demonstrated for the following participants:</p> <ul style="list-style-type: none"> • HHDC • Suppliers • Customers 	<ul style="list-style-type: none"> • Evidence that data is secure and that only relevant data can be accessed by the appropriate participant.
Test Group 4	<p><u>Synchronisation to UTC</u></p>	

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>The operator of the MA System should demonstrate that the MA System is synchronised to UTC, either by connection to internet time servers or a radio clock, and are accurate to within ± 20 seconds per month.</p>	<ul style="list-style-type: none"> Evidence that the MA System is synchronised to UTC within ± 20 seconds per month.
Test Group 5	<p><u>Inventory Control Information – normal processing</u></p> <p>The operator of the MA System should demonstrate the following for Inventory Control Information received from the UMSO:</p> <ul style="list-style-type: none"> Manual addition; Manual deletion; Manual modification; Electronic addition as per specified file format; Electronic deletion as per specified file format; Electronic modification as per specified file format. <p>Inventory Control Information data subject to testing:</p> <ul style="list-style-type: none"> Sub-Meter ID; Effective From Data; CMS Unit Reference; Number of Items; Switch Regime; Charge Code. <p>The operator of the MA System should demonstrate that the Inventory Control Files are in the specified format.</p> <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> Inventory Control Information data subject to testing can be added, modified or deleted manually; Inventory Control Information data subject to testing can be added, modified or deleted electronically; Electronic Inventory Control Information files are in the specified format; The Audit trail is correct.

Test Group Ref	Test Requirement Overview	Test Evidence Overview
Test Group 6	<p><u>Equipment Control Information (CMS controller) – normal processing</u></p> <p>The operator of the MA System should demonstrate the following for Equipment Control Information received from the UMSO:</p> <ul style="list-style-type: none"> • Manual addition; • Manual deletion; • Manual modification; • Electronic addition as per specified file format; • Electronic deletion as per specified file format; • Electronic modification as per specified file format. <p>Equipment control Information (CMS controller) data subject to testing:</p> <ul style="list-style-type: none"> • CMS Unit Reference; • Sum of CMS Controller devices; • Switch Regime; • Charge Code. <p>The operator of the MA System should demonstrate that the Equipment Control fields are in the specified format.</p> <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • Equipment Control Information data subject to testing can be added, modified or deleted manually; • Equipment Control Information data subject to testing can be added, modified or deleted electronically; • Electronic Equipment Control Information fields are in the specified format; • The Audit trail is correct.
Test Group 7	<p><u>Operation Event Log – normal processing</u></p> <p>The operator of the MA System should demonstrate:</p> <ul style="list-style-type: none"> • The successful receipt and processing of the daily operational event logs (CMS and MA Separate Systems) in the specified file format received from the CMS 	<p>Where the CMS and MA are separate Systems evidence that:</p> <ul style="list-style-type: none"> • The operational event logs have been received successfully; • The operational event logs are received on a daily basis;

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>or if applicable the transferring of data (CMS and MA integrated System) for the following scenarios:</p> <ul style="list-style-type: none"> ○ Scenario 1 – Switch Regime 999; ○ Scenario 2 – Switch Regime 998; ○ Scenario 3 – Control Failure (no data for a CMS Unit); ○ Scenario 4 - Revised Data after control failure (following day) <p>The operator of the MA System should demonstrate that data can be revised by receiving and processing a refresh or an incremental operational event log (CMS and MA Separate Systems) from the CMS in the specified format or if applicable the transferring of revised data (CMS and MA integrated System) from a previous control failure. (Scenario 3) 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 4.</p> <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	<ul style="list-style-type: none"> ● The operational event log values are correct; ● The operation event logs are in the specified file format; ● The operational values as per the operational event log are equal to those stored in the MA database. Minimum fields to check are: <ul style="list-style-type: none"> ○ CMS Unit Reference; ○ Time and Date; ○ Power Level (Percentage); ○ Charge Code; ○ Control Failure Flag. ● The audit trail is correct and the operational event logs have been retained for audit purposes. <p>Where the CMS and MA are an integrated System evidence that:</p> <ul style="list-style-type: none"> ● The operational event log values transferred are correct; ● The operational event values are transferred on a daily basis ● The audit trail is correct; ● The operational event logs can be successfully created for audit and testing purposes; ● The operational values as per the operational event log are equal to those stored in the MA database. Minimum fields to check are: <ul style="list-style-type: none"> ○ CMS Unit Reference; ○ Time and Date; ○ Power Level (Percentage); ○ Charge Code; ○ Control Failure Flag. ● The operation event logs are in the specified file format.

Test Group Ref	Test Requirement Overview	Test Evidence Overview
Test Group 8	<p><u>Inventory Control Information – error processing</u></p> <p>The operator of the MA System should demonstrate that invalid Inventory control information (manual and electronic) received from the UMSO is rejected.</p> <p>Invalid Inventory Control Information filename, trailer and data subject to testing is:</p> <ul style="list-style-type: none"> • Filename characters are in uppercase; • Header identifier is Z; • Sub-Meter ID is 8 characters long; • Effective From Date is in an invalid format (DDMMYYYY); • Version number is lower than a previously processed file for the same CMS Unit Reference; • CMS Unit Reference number is not unique; • Number of Items does not equal that in the detailed inventory; • Invalid Switch Regime of 997 i.e. not 999 or 998; • Charge code is one that is not running at full load; • Invalid Trailer where the total number of lines is incorrect. <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> • Manual attempts to add invalid Inventory Control Information data are rejected; • Inventory Control Information files received with invalid filenames are rejected; • Electronic attempts to add invalid Inventory Control Information data are rejected; • Data subject to change has remained unchanged; • The audit trail reflects that no changes have been made.
Test Group 9	<p><u>Equipment Control Information (CMS controller) – error processing</u></p> <p>The operator of the MA System should demonstrate that invalid Equipment Control Information (manual or electronic) received from the UMSO is rejected:</p> <p>Invalid Equipment Control Information data subject to testing:</p> <ul style="list-style-type: none"> • Filename characters are in uppercase; 	<p>Evidence that:</p> <ul style="list-style-type: none"> • Manual attempts to add invalid Equipment Control Information data are rejected; • Equipment Control Information files received with invalid filenames are rejected; • Electronic attempts to add invalid Equipment Control

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<ul style="list-style-type: none"> • CMS Unit Reference does not contain the text "Control" but "Equipment"; • Incorrect Sum of CMS Controller devices; • Invalid Charge Code for CMS controller; • Invalid Switch Regime of 997 i.e. not 998. <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above. Operational timescales for the relevant CMS is to be determined with ELEXON and appropriate testing undertaken.</p>	<p>Information data are rejected;</p> <ul style="list-style-type: none"> • Data subject to change has remained unchanged; • The audit trail reflects that no changes have been made.
Test Group 10	<p><u>Operational Event Log – error processing</u></p> <p>It should be noted that where the MA and the CMS are a single integrated System the applicant may not have to demonstrate compliance under this Test Group. The accredited test agent will determine if compliance is required or not.</p> <p>Where the CMS and MA are separate Systems the operator of the MA System should demonstrate that Operational Event log data received from the CMS in invalid file format is rejected correctly.</p> <p>The rejection of the following invalid file naming convention and invalid data should be demonstrated:</p> <p>Filename:</p> <ul style="list-style-type: none"> • Invalid filename – ".csv"; • Invalid Sub-Meter ID in file name; • Invalid month in file name; • Earlier version of file received after later version; • Filename not in lower case. <p>File Header:</p> <ul style="list-style-type: none"> • Invalid file header – (20 characters long); 	<p>Evidence that:</p> <ul style="list-style-type: none"> • Invalid Operational Event log files with invalid filenames or which containing invalid data are rejected; • Data subject to change has remained unchanged; • The audit trail reflects that no changes have been made.

Test Ref	Group	Test Requirement Overview	Test Evidence Overview
		<ul style="list-style-type: none"> • Invalid header identifier (Not H); • Invalid Sub-Meter ID in header; • Invalid year in header; • Earlier version of file received after later version; • Version in header does not equal version in filename. <p>File Body:</p> <ul style="list-style-type: none"> • CMS Unit Reference does not exist; • CMS Unit Reference is invalid; • Invalid seconds; • Percentage Power greater than 100; • Percentage power to 3 decimal places; • Invalid information flag. <p>File Trailer:</p> <ul style="list-style-type: none"> • Trailer identified invalid (not T); • The total number of lines reported in incorrect. <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	
Test Group 11 Test Group 12	<p><u>Calculating Consumption</u></p> <p>The operator of the MA System should demonstrate the calculation of import kWh and import kVArh consumption in HH periods in UTC for the following scenarios:</p> <ul style="list-style-type: none"> • Scenario 1 – Switch Regime 999; • Scenario 2 – Switch Regime 998; • Scenario 3 – Control Failure (no data for a CMS Unit); • Scenario 4 - Revised Data after control failure (following day). 	<p>Evidence that:</p> <ul style="list-style-type: none"> • The calculation of import kWh and import kVArh consumption in HH periods in UTC are correct; • The audit trail is correct. 	

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>Details of the scenarios subject to testing are given in Section 4.</p> <p>The operator of the MA System should demonstrate the calculation of import kWh and import kVArh consumption in HH periods in UTC for the following scenarios where data is not available (Scenario 3):</p> <ul style="list-style-type: none"> Operational event Log missing CMS Reference for a settlement day - MA system applies data representative of Switch Regime 999 as indicated in the control file; Operational event Log missing CMS Reference for a settlement day - MA system applies data representative of Switch Regime 998 as indicated in the control file; Operational Event Log missing CMS Reference for a range of Settlement Days - MA system applies data representative of Switch Regime 999 as indicated in the control file; Operational Event Log missing CMS Reference for a range of Settlement Days - MA system applies data representative of Switch Regime 998 as indicated in the control file. <p>The operator of the MA System should demonstrate the calculation of import kWh and import kVArh consumption in HH periods in UTC for revised data (Scenario 4) which covers:</p> <ul style="list-style-type: none"> previously unknown data; Data which has been amended. <p>The operator of the MA System should demonstrate the recording of the audit trail for the scenarios above.</p>	
Test Group 13	<p><u>Providing Output File to HHDC</u></p> <p>The operator of the MA System should demonstrate that the Equivalent Meter Output files are produced in the correct format as per Section 4.5.3 for the</p>	<p>Evidence that:</p> <ul style="list-style-type: none"> The values included in the Equivalent Meter Output files

Test Group Ref	Test Requirement Overview	Test Evidence Overview
	<p>following scenarios:</p> <ul style="list-style-type: none"> • Scenario 1 – Switch Regime 999; • Scenario 2 – Switch Regime 998; • Scenario 3 – Control Failure (no data for a CMS Unit); • Scenario 4 - Revised Data after control failure (following day). <p>The operator of the MS System should demonstrate that the Equivalent Meter Output files are sent to the appointed HHDC.</p>	<p>are identical to those calculated above;</p> <ul style="list-style-type: none"> • The format of the Equivalent Meter Output Files is correct.
Test Group 14	<p><u>Exception List</u></p> <p>The operator of the MA System should demonstrate that:</p> <ul style="list-style-type: none"> • The MA System generates an exception list for CMS Unit Refs that have been loaded into the MA System as per the control file that have not been reported in the operational event log; • The exception list is generated on the day the CMS Unit is found to be missing; • The exception lists are sent to the UMSO and Customer on a monthly basis as a matter of routine; • The exception list can be sent, to either the UMSO or Customer, on request. 	<p>Evidence that the:</p> <ul style="list-style-type: none"> • Exception list is complete • Exception list is generated to correct time scales • Exception list can be sent correctly as a matter of routine and on an ad-hoc basis.
Test Group 15	<p><u>Ad-hoc extracts - Operational event data</u></p> <p>The operator of the MA System should demonstrate that:</p> <ul style="list-style-type: none"> • Ad-hoc extracts of the operational event data received from the CMS can be provided to LDSO on request. 	<p>Evidence that the:</p> <ul style="list-style-type: none"> • The extracts can be produced; • The extracts contain the correct event data originally reported.

7 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 5](#)). Evidence guidelines are given for each Test Group in the Test Group Summary ([Section 6](#)). 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 CMS for the Customer.

8 Document Control

a Authorities

Version	Date	Author	Reviewer	Reason for review
V0.1	26-February-08	Evan Reed	Justin Andrews	Peer Review
			Mike Smith	
			Katie Wilkinson	
V1.0	28-February-08	Evan Reed	David Osborne	Approved version for use
V1.3	03-June-08	James Everley	Justin Andrews	Updated in line with industry comments received

Version	Date	Author	Authoriser	Signature
V2.0	29 July 2208	James Everley	David Osborne	

b Distribution

Recipient	Version	Date	Reason
BSC Parties and other interested parties	V1.0	28-February-08	For Use
Interested CMS Parties	V1.3	03-June-08	For Review
BSC Parties and other interested parties	V2.0	18-August-08	For Use

c References

Reference	Document
CP1196	Changes to incorporate Central Management Systems in Unmetered Supplies arrangements
BSCP520	Unmetered Supplies Registered in SMRS
BSCP537	Qualification Process for SVA Parties, SVA Party Agents and CVA MOAs

A 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
HHDC	Half Hourly Data Collector
MA	Meter Administrator
MOA	Meter Operator Agent
UMSO	Unmetered Supplies Operator
SVG	Supplier Volume Allocation Group
UMSUG	Unmetered Supply User Group