Redlined BSCP601 text for CP1513 'Updates to BSCP601, CoP3 and CoP5'

This CP proposes changes to sections 1.6.1, 3.4, 3.4.3, 3.4.5, 3.4.6, 3.4.7, 3.4.8, 3.4.9, 3.4.10, 3.4.11, 3.4.12, 3.4.13, 3.4.14, 3.4.15, 3.4.16, 3.4.17, 3.4.19, 3.4.21, 3.4.22, 3.4.24, 3.4.25, 3.4.26, 3.4.27, 3.5.3, 3.5.7. We have redlined these changes against Version 19.0, which will go live as part of the June 2019 Release if Approved.

There is no impact on any other part of this document for this CP.

Amend section 1.6.1 as follows:

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1.6.1 Acronyms

Full definitions of the acronyms are, where appropriate, included in the Balancing and Settlement Code.

The terms used in this BSC Procedure are defined as follows.

BSCCo	Balancing and Settlement Code Company
CDCA	Central Data Collection Agent
CoP	Code of Practice
CT	Current Transformer
CTA	Compliance Testing Agent
HHDC	Half Hourly Data Collector (Qualified)
MD	Maximum Demand
ME	Metering Equipment
MOA	Meter Operator Agent
SMETS	Smart Metering Equipment Technical Specifications
SMRS	Supplier Meter Registration Service
SVA	Supplier Volume Allocation
WD	Working Day

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Amend section 3.4 as follows:

3.4 Specification for Compliance Testing of Metering Equipment for Codes of Practice One, Two, Three, Five and Ten

Amend section 3.4.3 as follows:

3.4.3 Test Constraints

3.4.3.1 Applicable Codes of Practice

Subject to 3.4.1 d) above, the following clauses refer to the Test Procedure solely for Compliance Testing to the requirements of a relevant Code of Practice at any one time and not to any other Code of Practice reference in the Code.

3.4.3.2 Timetable

For each Compliance Testing Application the Test Laboratory shall complete all Compliance Testing within 40 business days of receipt of approval from BSCCo.

Where Compliance Testing cannot be completed within the timetable the Test Laboratory shall inform BSCCo prior to the end of the initial 40 business day testing period and obtain agreement to a revised schedule.

3.4.3.3 Test Conditions

To test the metering accuracy requirements in c~~C~~lause 3.4.8~~5.4~~ below, the test conditions shall be maintained in accordance with BS EN 61036, BS EN 60521, BS EN 62053-11 or BS EN 62053-22 for indoor meters. The appropriate accuracy Class of the Meter Equipment under test will be employed.

For CoP10 Meters, tests for accuracy need not be repeated providing the Meter is approved for use under the Electricity Act 1989.

3.4.3.4 Samples for Testing

The Applicant shall provide a minimum of two samples of the chosen Metering Equipment and any supporting software and hardware necessary to fulfil testing.

Amend section 3.4.5 as follows:

3.4.5 General Test Conditions

Before testing the metering accuracy requirements in clause 3.4.8 'Accuracy Requirements {5.3}' below, the following conditions shall be maintained:

(a) The Meter shall be tested in its case with the cover in position and all its intended part earthed;

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(b) Seals need not be applied to any sealing point during testing;

(c) Before any test is conducted ~~–~~, the circuits and instrumentation shall have been energised for sufficient time to reach thermal stability;

(d) For polyphase Meters, the phase sequence shall be marked on the diagram of connections and voltages and currents shall be substantially balanced (see table 18 of BS EN 61036 for details);

(e) Reference conditions shall be in accordance with table 19 of BS EN 61036;

(f) In all cases taking into account the additional percentage error due to change of influence quantities in accordance with table 14 of BS EN 61036; and

(g) Notwithstanding rack mountable Meters, where a Meter has both Import and Export functionality, then the Active Import Energy flow is deemed to be from the extreme left hand terminal[1] (Red phase in) to the adjacent load terminal on the same phase (Red phase out).

Amend section 3.4 .6 as follows:

3.4.6 Measured Quantities {4.1.1}

The following tests shall be performed to establish the measured quantities:

(a)	i) Establish if the Pulse Multiplier can be of a value other than 1 (under any circumstance); and ii) Where the value can be other than 1 record the values and circumstances.	**001**
(b)	establish the number and type of Measured Quantities available on the Meter;	**002**
(c)	if more than one Measured Quantity configuration is available, list all configurations;	**003**
(d)	confirm that a cumulative register display is available for each Measured Quantity (see also 3.4.12);	**004**
(e)	Import Active Energy is measured in kWh; Import Reactive Energy is measured in kvarh; ~~*(CoP1, 2, 3, 5 and 10)*~~	**005**
(f)	Export Active Energy is measured in kWh; Export Reactive Energy is measured in kvarh ~~*(CoP1, 2, 3 5 and 10)*~~; and	**006**
(g)	confirm that Measured Quantities are available in both kilo and Mega values. *(CoPs 1, 2, 3 and 5*~~*CoP1 and 2 only*~~*)*	**007**

Amend section 3.4.7 as follows:

3.4.7 Demand Values {4.1.2}

[1] Viewed from the front of the Meter, as though reading the display.

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The following tests shall be performed to confirm that Demand Values are provided:

(a)	confirm that a kW value is provided for each Demand Period for each Active Energy Measured Quantity; and kvar value is provided for each Demand Period for each Reactive Energy Measured Quantity. ~~*(CoP1, 2, 3, 5 and 10)*~~	**008**
(b)	Confirm that reactive Import and Export quantities (kvar and kvarh) can be provided separately for both Import and Export Active Ppower conditions. *(CoPs 1, 2, 3 and 5)* ~~*This test is relevant for Meters that are to be Registered in the Central Meter Registration Service (CMRS).*~~	**009**
(c)	Confirm that reactive quantities (kvar and kvarh) can~~, in addition to (a) above,~~ be provided cumulatively as both Import and Export regardless of Active Ppower conditions. ~~*(CoP1, 2, 3 and 5)*~~ ~~*This test is relevant for Meters that are to be registered in the Supplier Meter Registration Service (SMRS).*~~	**0~~0~~10**
(d)	where Active Import and Active Export values are provided confirm that each value is gross and recorded separately. (*CoPs 3, 5, and 10 ~~only~~);* and	**0~~0~~11**
(e)	confirm that Demand Values are available in both kilo and Mega values. *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)*	**0~~0~~12**

Amend section 3.4.8 as follows:

3.4.8 Accuracy Requirements {5.3}

(a) Active Energy

Meters subject to *CoP10* compliance testing shall meet all of the accuracy requirements for Active Energy if the Meter is approved under SI 1998 No 1566 or SI 2006 No 1679.

Tests shall be carried out at fundamental frequency (50Hz) to verify that the Active Energy measurements are within the limits shown in Table 1 below. The measurement uncertainty at fundamental frequency of the measurement system used shall not be greater than: ±0.01% (*CoP1*); ±0.05% (*CoP2*); ±0.1% (*CoP3*); or ±0.2% (*CoP5*).	**013**

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Table 1 Active Energy

Value of Current (I)		Power factor (Cos φ)	Percentage error limits[2] for Meters of Class				
For whole current Meters	For transformer operated Meters[3]		0.2S *(CoP1)*	0.5S *(CoP2)*	0.5 *(CoP2)*	1 *(CoP3)*	2 *(CoP5)*
-	$0.01\ I_n \leq I < 0.05 I_n$	1	±0.4	±1.0	-	-	-
-	$0.05\ I_n \leq I \leq I_{max}$	1	±0.2	±0.5	-	-	-
-	$0.02\ I_n \leq I < 0.1 I_n$	0.5 ind 0.8 cap	±0.5 ±0.5	±1.0 ±1.0	-	-	-
-	$0.1\ I_n \leq I \leq I_{max}$	0.5 ind 0.8 cap	±0.3 ±0.3	±0.6 ±0.6	-	-	-
$0.05\ I_b \leq I < 0.1\ I_b$[4]	$0.02\ I_n \leq I < 0.05\ I_n$	1	-	-	±1.0	±1.5	±2.5
$0.1\ I_b \leq I \leq I_{max}$	$0.05\ I_n \leq I \leq I_{max}$	1	-	-	±0.5	±1.0	±2.0
$0.1\ I_b \leq I < 0.2\ I_b$[5]	$0.05\ I_n \leq I < 0.1\ I_n$	0.5 ind 0.8 cap	-	-	±1.3 ±1.3	±1.5 ±1.5	±2.5 -
$0.2\ I_b \leq I \leq I_{max}$	$0.1\ I_n \leq I \leq I_{max}$	0.5 ind 0.8 cap	-	-	±0.8 ±0.8	±1.0 ±1.0	±2.0 -

Source †: BS EN 62053 - 22 for *CoPs 1 and 2* (Classes 0.2S and 0.5S), or BS EN 62053 - 11 for *CoP 2* (Class 0.5), and BS EN 60521 and BS EN 61036 for *CoPs 3 and 5* (Classes 1 and 2).

(b) Reactive Energy

Tests shall be carried out at fundamental frequency (50Hz) to verify that the Reactive Energy measurements are within the limits show in Table 2 below. The measurement uncertainty at fundamental frequency of the measurement system used shall not be greater than ±0.4%. *(CoPs 1, 2, 3 and 5)*~~Not applicable to CoP10~~	**014**

[2] Single-phase Meters and polyphase Meters with balanced loads.
[3] BS EN 60521 specifies values of current as 'basic' (i.e. see figures in whole current Meters column)
[4] BS EN 60521 specifies one test point (0.05 I_b)
[5] BS EN 60521 specifies one test point (0.1 I_b)

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Table 2 Reactive Energy

Value of Current (I)		Sin φ	Percentage error limits[2] for Meters of Class		Applicable BS EN Standard for Test Criteria
For whole current Meters	For transformer operated Meters		2 *(CoP1)*	3 *(CoPs 2, 3 and 5)*	
$0.05\ I_b \le I < 0.1\ I_b$	$0.02\ I_n \le I < 0.05\ I_n$	1	±2.5	±4.0	BS EN 62053 - 23 and BS EN 61268
$0.1\ I_b \le I \le I_{max}$	$0.05\ I_n \le I \le I_{max}$	1	±2.0	±3.0	
$0.1\ I_b \le I < 0.2\ I_b$	$0.05\ I_n \le I < 0.1\ I_n$	0.5 ind or cap	±2.5	±4.0	
$0.2\ I_b \le I \le I_{max}$	$0.1\ I_n \le I \le I_{max}$	0.5 ind or cap	±2.0	±3.0	
$0.2\ I_b \le I \le I_{max}$	$0.1\ I_n \le I \le I_{max}$	0.25 ind or cap	±2.5	±4.0	BS EN 62053 - 23
$0.2\ I_b \le I \le I_b$	$0.1\ I_n \le I \le I_n$	0.25 ind or cap	-	±10.0	BS EN 61268
$0.1\ I_b \le I \le 0.2\ I_b$	-	1	-	±4.0	BS 5685 Part 4
$0.2\ I_b < I \le I_{max}$	-	1	-	±3.0	
$0.2\ I_b \le I \le I_{max}$	-	0.5 ind and 0.8 cap	-	±3.0	

Source †: BS EN 62053 - 23 for *CoPs 1 and 2* (Classes 2 and 3), and BS EN 61268 (Class 3) for *CoPs 3 and 5* or BS 5685: Part 4 (Class 3) for *CoPs 2, 3 and 5*. * for whole current metering percentage relates to $I_{max.}$

These limits of error for both Active and Reactive Energy shall apply at the reference conditions defined in the appropriate Meter.

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Amend section 3.4.9 as follows:

3.4.9 Measurement Compensation for Measurement Transformer Error(s) {4.2.2}

Record the available range of measurement transformer compensation adjustment provided for both current and voltage measurements. *(CoPs 1, 2, 3 and 5)*~~Not applicable to CoP10~~	**015**

Amend section 3.4.10 as follows:

3.4.10 Compensation for Power Transformer and Line Losses {4.2.3}

Record the available range of power transformer compensation adjustment provided. (If this adjustment is recorded as part of test 3.4.9 above then record that no additional adjustment is available) *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10*~~	**016**

Amend section 3.4.11 as follows:

3.4.11 Meter {5.3}

Establish the following parameters for the Meter under test:

(a)	record whether the Meter is of a Static or induction disc type;	**017**
(b)	record whether the Meter has an integral Outstation;	**018**
(c)	establish that the Active Energy Meter meets the requirements of: i. *CoP1* BS EN 62053-22 Class 0.2S; ii. *CoP2* BS EN 62053-22 Class 0.5S or BS EN 62053-11 Class 0.5; iii. *CoP3* BS EN 61036 Class 1 or BS EN 60521 Class 1;~~ or~~ iv. *CoP5* BS EN 61036 Class 2 or BS EN 7856 Class 2; or v. *CoP10* SI 1998 No 1566 or SI 2006 No 1679.	**019**
(d)	establish whether the Import Active Energy Meter meets the requirements of Schedule 7 of the Electricity Act 1989;	**020**
(e)	establish that the Reactive Energy Meter meets the requirements of; i. *CoP1* BS EN 62053-23 Class 2.0; ii. *CoP2* BS EN 62053-23 Class 3 or BS 5685 Part 4; iii. *CoP3* BS EN 61268 Class 3 or BS 5685 Part 4; or iv. *CoP5* BS EN 61268 Class 3 or BS 5685 Part 4. ~~Not applicable to CoP10.~~	**021**
(f)	establish whether the number of measuring elements is one less or equal to the number of primary system conductors;	**022**

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(g)	record whether provision has been made for the recording of measurement transformer ratios on the Meter's name plate; *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**023**
(h)	if the Meter is a static Meter with combined display and/or Outstation, then confirm that the ratios can be displayed and downloaded during the interrogation process;	**024**
(i)	Also confirm that any compensation factors that have been applied for measurement transformer errors and/or system losses, and where this is a constant factor applied at security level 3, can be similarly displayed and downloaded; *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**025**
(j)	confirm that the Meter includes a non-volatile Meter register of cumulative energy for each Measured Quantity;	**026**
(k)	confirm that the Meter Register(s) do not roll-over more than once within the normal reading cycle [90 days at full load]; and *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**027**
(l)	where the Meter is to be used with an external Outstation, confirm that the Meter is fitted with at least one output pulse facility for each Measured Quantity (two output pulse facilities are required in the case of CoP1). *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**028**

Amend section 3.4.12 as follows:

3.4.12 Displays {5.4.1}

(a) Confirm that the Metering Equipment is capable of displaying the following primary information (not necessarily simultaneously):

(a)	the total cumulative energy values for each Measured Quantity in actual scaled values and that such values are stored in non–volatile memory;	**029**
(b)	the current time and date;	**030**
(c)	the CT and/or VT ratios that have been programmed into the Meter;	**031**
(d)	any compensation factor applied for measurement transformer errors and/or system losses; and *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**032**
(e)	that, where the Meter is combined with the display and/or Outstation and a constant factor is applied, such factor is applied at security level 3. *(CoPs 1, 2, 3 and 5)*~~*Not applicable to CoP10.*~~	**033**

(b) Confirm that the Metering Equipment is capable of enabling the display of the following information:

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(a)	the Maximum Demand ("MD") for kW or MW *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* per month;	**034**
(b)	the Maximum Demand ("MD") for kW or MW *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* for other programmable charging periods;	**035**
(c)	the Maximum Demand ("MD") for kVA or MVA *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* per month can;	**036~~4~~**
(d)	the Maximum Demand ("MD") for kVA or MVA *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* for other programmable charging periods;	**037**
(e)	twice the kWh or MWh *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* advance from the commencement of the current Demand P~~p~~eriod;	**038**
(f)	twice the kVAh or MVAh ~~*(CoP1 and 2 only)*~~ advance from the commencement of the current Demand P~~p~~eriod; *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~).*	**039**
(g)	the cumulative Maximum Demand;	**040**
(h)	the number of Maximum Demand resets;	**041**
(i)	the multi rate display sequence, for at least 8 rates selectable over the calendar year;	**042**
(j)	whether a reverse running indication for Active Energy is provided. *(CoPs 3 and 5~~ only~~)*;	**043**
(k)	the indicated Maximum Demand is re-settable at midnight of the last day of the selected charging period;	**044**
(l)	the indicated Maximum Demand is re-settable for a part of a charging period; and	**045**
(m)	any Maximum Demand manual reset button is sealable.	**046**

Amend section 3.4.13 as follows:

3.4.13 Facilities {5.4.2}

(CoPs 1, 2, 3 and 5)~~Not applicable to CoP10~~

Establish whether the Meter is capable of providing different voltage free pulsed outputs for local use.	**047**
If test 04~~7~~4 is confirmed then confirm that the facilities meet the following requirements as shown in Table 3.	**048**

Table 3 Pulse Output Requirements.

Requirement	Code of Practice			
	1	2	3	5

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Number of Outputs	1 per Measured Quantity	1 per Measured Quantity	3 min (See 3.4.13 (a))	3 min (See 3.4.13 (a))
Pulse Rate	Min at full load 1000 per Demand Period	Min at full load 1000 per Demand Period	Between 0.1 and 2/ second	Between 0.1 and 2/ second
Nominal Pulse Duration (mS)	80	80	80	80

(a)	confirm that at least two of the outputs can be allocated to the Measured Quantities identified in {5.4.2}. *(~~Applies to~~ CoPs 3 and 5 ~~only~~);* and	**049**
(b)	confirm that one output can be allocated to the Demand Period reset (usually 30 minutes) within a tolerance of ±0.1% and a duration of between 0.5 and 10 seconds.	**050**

Amend section 3.4.14 as follows:

3.4.14 Outstation {5.5}

Where an Outstation has been provided as part of the Metering Equipment for test, the protocol shall be Approved in accordance with this BSCP.

Establish that:

(a)	The Outstation has a unique Outstation identification code;	**051**
(b)	For Meters with integral Outstations an auxiliary terminal provides for the Outstation's energisation for remote interrogation purposes *(CoP1 ~~only~~).* For Meters with integral Outstations record whether an auxiliary terminal provides for the Outstation's energisation for remote interrogation purposes *(CoP2 ~~only~~)*;	**052**
(c)	The Outstation is capable of communicating with more than one Instation (not simultaneously and of similar type or otherwise);	**053**
(d)	It is possible to repeatedly retrieve data throughout the Outstation data storage period;	**054**
(e)	Any "read" operation does not alter or delete any stored metered data; and	**055**
(f)	The Outstation can provide all metered data stored from the time of commencement of any specified date upon request by the Instation during the data storage period of the outstation.	**056**
(g)	In addition, establish whether the Outstation is capable of sending metering data automatically *(CoPs 5 and 10 ~~only~~).* If this test is satisfied then:	**057**
(h)	Verify that the metering data sent complies with section 3.4.22 'Level 1 Passwords' of this test specification *(CoPs 5 and 10 ~~only~~)*; and	**058**
(i)	Establish whether the Outstation is capable of sending metering data on a daily basis as a minimum *(CoPs 5 and 10 ~~only~~).*	**059**

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Amend section 3.4.15 as follows:

3.4.15 Data Storage {5.5.1}

The Metering Equipment shall be continuously energised at full load for a period of five days and afterwards at a cyclical variable load for a further fifteen days, to determine the total number of kWh or MWh *(~~CoP1 and 2 only~~CoPs 1, 2, 3 and 5)* supplied to the Meter over the whole twenty day period.

During the test cycle establish that:

(a)	from the beginning of the current Demand Period, twice the kWh or MWh *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* is being registered in the kW or MW *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* Maximum Demand register; and	**060**
(b)	from the beginning of the current Maximum Demand P~~p~~eriod, twice the kVAh or MVAh *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* is being registered in the kVA or MVA *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* Maximum Demand register.	**061**

on completion of the twenty day cycle above, the following tests shall be performed and confirm that:

(a)	each Demand Value is identifiable to its respective date and time; and	**062**
(b)	a storage capacity of 48 periods per day in accordance with Table 4 below is available for all Demand Values as integer multiples of kW or MW *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)*;	**063**

Table 4 Data Storage Periods

Code of Practice	Minimum Storage Period(days)
1	10
2	10
3	20
5	20
10	20

(a)	for each of the initial five days, the sum of the Demand Values for each block of 48 half-hour periods are within 0.1% of the advance of the total cumulative register of the associated Meter for the same interval;	**064**
(b)	the value of any energy measured in a Demand Period, but not stored in that Demand Period are carried forward to the next Demand Period;	**065**
(c)	for each of the twenty days under test that the contents of the kW or MW *(CoPs 1, 2, 3 and 5~~CoP1 and 2 only~~)* data stored facility have been stored correctly; and	**066~~3~~**
(d)	for separate Meter/Outstation combinations, that the Outstation registers can be set to match and increment with the Meter registers.	**067**

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	(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)	

One test sample of the Outstation shall be provided by the Applicant with its memory occupied with data to within twenty days of capacity (appropriate for the number of channels configured). With prior agreement from BSCCo integration periods other than 30mins may be used to facilitate the following two tests.

Upon further Energisation, confirm that;

(a)	on reaching maximum memory storage capacity, that any new data overwrites the oldest stored data; and	**068**
(b)	no other data has been altered or removed.	**069**

Amend section 3.4.16 as follows:

3.4.16 Time Keeping {5.5.2}

With the Metering Equipment connected to a supply, note the contents of all energy registers. Ensure that the time and date are correctly set to UTC. Disconnect the Metering Equipment from the supply and after 10 days[6] in the de-energised state verify on reconnection of the supply that:

(a)	all stored data has been correctly stored and is not corrupt;	**070**
(b)	the Metering Equipment internal clock is accurate to within ±10 seconds[6]; and	**071**
(c)	partial Demand Values in which an Outstation supply failure and/or restoration occurs and any zero values associated with the Outstation supply failure are marked so that they can be identified by the Instation.	**072**

With the Metering Equipment energised, set the date and time correctly to UTC. Apply a load equivalent to full load (alternatively a high pulse rate of 2,000 pulses per half hour) using a stable power supply. Avoid any communication or time synchronisation with the Outstation for ten[7] days. At the end of the test and before any time synchronisation occurs, verify that:

(a)	the Metering Equipment internal time clock is accurate to within ±10 seconds[8]; and	**073**
(b)	the duration of each Dd~~d~~emand Pp~~p~~eriod is within ±0.1% of 30 minutes, this being achieved by the comparison of stored energy values or pulse counts in each Demand Period.	**074**

Set the Metering Equipment internal time clock to five minutes slow with respect to UTC. Then synchronise the internal time clock using the remote Instation and check that the Demand Pp~~p~~eriod has been marked with an alarm indication.	**075**
Repeat the synchronisation test using the Local Interrogation Unit and check that the	**076**

[6] For tests to Code of Practice 3, 5 and 10, period of disconnection is 20 days and the acceptable tolerance is ±20 Seconds.
[7] For tests to Codes of Practice 3, 5 and 10, this period is 20 days
[8] For tests to Code of Practice 3, 5 and 10, the acceptable tolerance is ±20 Seconds.

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Demand Period has been marked with an alarm indication.	

Amend section 3.4.17 as follows:

3.4.17 Monitoring Facilities {5.5.3}

3.4.17.1 Phase Failure Indication Tests

Ensure that the Metering equipment is connected to a supply and has no alarms or flags set. Undertake the following phase failure tests:

(a)	disconnect one phase from the Metering Equipment and ensure that a phase failure has occurred and is assigned to the relevant Demand Period;	**077**
(b)	repeat the disconnection process for each of the remaining phases in separate Demand Periods;	**078**
(c)	repeat the disconnection process for combinations of multiple phase failure; and	**079**
(d)	verify phase failure alarm resets on restoration of normal supply after each test.	**080**

3.4.17.2 Battery Monitoring Tests

If battery fitted, establish the method of battery monitoring and test for alarms and indications tagged to the relevant Demand Periods, if necessary by disconnecting the battery.	**081**

Note 1: It may not be possible to test some battery monitoring such as extended shelf life or out of service monitoring or total battery life.

Note 2: Depending on the manufacturer and the type of Metering Equipment under test, it may be necessary to temporarily disconnect the power supply to the Metering Equipment for safety reasons whilst the battery is disconnected.

3.4.17.3 Time Setting Alarms

For Outstations using other methods of time synchronisation, such as a Radio Teleswitch, confirm that any truncated or extended Demand Period is tagged with a separate alarm indication.	**082**

3.4.17.4 Other Alarms

Using the Local Interrogation Unit access the local port and change data other than time and/or date. Confirm that the relevant Demand Period is tagged with a separate alarm indication.	**083**
Using the Instation to access the remote port, change data other than time and/or date. Confirm that the relevant Demand Period is tagged with a separate alarm indication.	**084**

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3.4.17.5 Reverse Running

Where an Active Energy reverse running display is provided, determine that the requirements of BS EN 61036 or BS EN 62053-22 as appropriate are met. Establish under what conditions the reverse running flag is activated and record those conditions. Tests should include single and polyphase power reversals and set the appropriate flag for the Demand Period affected *(CoPs 3 and 5 ~~only~~, and if fitted).*	**085**
Test that upon return to normal power flow, the reverse running flag is no longer present in the unaffected Demand Period *(CoPs 3 and 5 ~~only~~, and if fitted).*	**086**

Amend section 3.4.19 as follows:

3.4.19 Local Port

Using the Local Interrogation Unit provided by the Applicant, confirm that:

(a)	The local port provides data to a Local Interrogation Unit via an opto port to BS EN 61107 *(CoPs 3 and 5)* or BS EN 62056-21 *(CoPs 1, 2 and 10)*; or	**088**
(b)	The local port provides data to a Local Interrogation Unit via another type of port; and	**089**
(c)	Repeat collections of stored data are available throughout the storage period and verify that and "read" operation does not delete or modify any stored metering data.	**090**

Amend section 3.4.20 as follows:

3.4.20 Remote Port

Using a modem or similar device provided by the Applicant, via one of the prescribed media {5.6.2} confirm that:

(a)	The remote port is sealable; and	**091**
(b)	Repeat collections of stored data are available throughout the storage period and verify that any "read" operation does not delete of modify any stored metering data	**092**

Amend section 3.4.21 as follows:

3.4.21 Password Protection

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(a)	For separate Outstations establish that a password is required to read or change any data. *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)*	**093**
(b)	For integral Outstations establish that **four**[9] discrete password controlled access levels are provided for both local and remote interrogation.	**094**
(c)	For alpha numeric character passwords, ensure that passwords are no less than six characters and no more than twelve characters long. Ensure that passwords are formed from case insensitive or sensitive alpha characters (A to Z) and/or digits (0 to 9) and/or the underscore character (_); or *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)*	**095**
(d)	For hexadecimal character passwords, ensure that passwords are no less than eight characters and no more than twelve characters long. Ensure that passwords are formed from upper case hexadecimal characters (0 to F). *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)*	**096**

Amend section 3.4.22 as follows:

3.4.22 Level 1 Passwords

Using the Level 1 password, establish that the following data can be retrieved:

(a)	Outstation ID;	**097**
(b)	all programmable Demand Values;	**098**
(c)	all programmable cumulative Measured Quantities;	**099**
(d)	the Maximum Demand for kW and/or kVA per programmable charging period;	**100**
(e)	the multi-rate cumulative Active Energy values;	**101**
(f)	the VT and CT transformer ratios, where appropriate;	**102**
(g)	(for combined Meter and Outstation only), the VT and CT transformer error correction factor and/or system loss factor applied as a constant factor to the entire dynamic range; *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~).*	**103**
(h)	all alarm indications; and	**104**
(i)	Outstation time and date	**105**

Establish that it is not possible to change any of the above values at Level 1 Password.	**106**

Amend section 3.4.23 as follows:

[9] For CoP 10 only three are required

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Amend section 3.4.24 as follows:

3.4.24 Level 3 Passwords

Using the Level 3 Password, establish that all the functionality listed at Level 2 can be performed and in addition that the following programming can be performed:		**110**
(a)	Displays and Facilities as defined in c~~C~~lauses 3.4.12 'Displays {5.4.1}' and 3.4.13 'Facilities {5.4.2}' of this test specification;	**111**
(b)	measurement transformer ratios as defined in c~~C~~lause 3.4.11 'Meter {5.3}' of this test specification;	**112**
(c)	(for combined Meter and Outstation only), the VT and CT transformer error correction factor and/or system loss factor applied as a constant factor to the entire dynamic range; and *(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~).*	**113**
(d)	passwords for Levels 1, 2 and 3.	**114**
(e)	where applicable, confirm it is possible to programme the schedule for automated transfer of Level 1 metering data via Level 3 access *(CoPs 5 and 10 ~~only~~)*.	**115**

Establish that it is possible to read additional information within the Metering Equipment to enable the programmed information to be confirmed.	**116**

Amend section 3.4.25 as follows:

3.4.25 Level 4 Passwords

(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)

If the Level 4 Password is implemented electronically then:

(a)	establish that all the functionality listed at Level 3 can be performed and in addition that the following alterations can be performed:	**117**
(b)	calibration of the Meter (only where the Meter is integral with the Outstation);	**118**
(b)	setting the measurement transformer ratios, where appropriate;	**119**
(d)	setting the measurement transformer error correction and/or system loss factors applied as a complex factor; and	**120**
(e)	programming the Level 3 & 4 Passwords.	**121**

If the Level 4 Password is implemented by removing the seals and cover, then establish that the following alterations can be performed:

(a)	calibration of the Meter (only where the Meter is integral with the Outstation);	**122**

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(b)	setting the measurement transformer ratios, where appropriate; and	**123**
(c)	setting the measurement transformer error correction and/or system loss factors applied as a complex factor.	**124**

Amend section 3.4.26 as follows:

3.4.26 Password Monitoring {Appendix D}

Using the Approved Protocol [10], verify that the password offered determines the Level of access to the data within the Metering Equipment.	**125**

Verify, by accessing the Metering Equipment at least eight times with an "illegal" password(s), that:

(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)

(a)	the illegal password counter resets to zero every hour on the hour change; and	**126**
(b)	after the seventh illegal password attempt entered between counter resets, that access is prohibited at all levels until the counter resets.	**127**

Amend section 3.4.27 as follows:

3.4.27 Additional Tests

3.4.27.1 Electromagnetic Compatibility Tests

(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)

In addition to the EMC tests carried out by the Electricity Meter Examination Service of the Director of Electricity Supply as part of the process of Type Approval for the Meter in accordance with BS EN 61036, verify, by testing under all the conditions detailed in BS EN 61036, that:

(a)	any stored data and time/date is not corrupted or has been destroyed; and	**128**
(b)	the metering accuracy remains within the requirements of c~~C~~lause 3.4.8 'Accuracy Requirements {5.3~~4~~}' of this ~~Compliance T~~testi~~ng~~ specification.	**129**

3.4.27.2 Immunity to Electromagnetic HF Fields

(CoPs 1, 2, 3 and 5~~Not applicable to CoP10~~)

Verify, by testing in accordance with IEC 61000-4-3, and under the following conditions:

- the voltage and auxiliary circuits energised with reference voltage;
- a frequency band of 26MHz to 1GHz;

[10] If the protocol has not yet received Approval, record the status and description of the protocol used for testing purposes.

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- a test field strength of 12.5V/m; and
- a carrier of 80% amplitude modulated with a 1kHz sine wave.

(a)	that without any current in the current circuits and the current terminals open circuit the application of the HF fields shall not produce a change in the Meter Register reading of more than 0.01kWh and the test output shall not produce a signal equivalent to more than 0.01kWh. (Where VT and CT connected Meter(s) is under test, equivalent scaled values should be used taking into account the transformer ratios); and	**130**
(b)	that with basic current Ib, and power factor equal to 1.0, at sensitive frequencies or frequencies of dominant interest, the variation of error does not exceed 3%.	**131**

On completion of each EMC test verify that:

(a)	any stored data is not corrupted or has been destroyed; and	**132**
(b)	the metering accuracy remains within the requirements of cClause 3.4.8 'Accuracy Requirements {5.3}'4 of this test specification.	**133**

NOTE: Where VT and CT connected Meter(s) are under test the equivalent scaled values, taking into account the transformer ratios, should be used when considering any differences in Meter Register reading and output signals.

3.4.27.3 Sealing {5.7}

Ensure that adequate sealing facilities are provided for Settlement requirements.	**134**

Amend section 3.5.3 as follows:

3.5.3 Test Procedure

3.5.3.1 Applicable Codes

The following clauses refer to the test procedure solely for testing to the requirements of Code of Practice Six and not to any other Code of Practice referenced in the Balancing and Settlement Code.

3.5.3.2 Test Conditions

To test the metering accuracy requirements in cClause 3.5.4 below the test conditions shall be maintained in accordance with BS EN 61036 Class 2 or BS EN 60521 Class 2 for indoor meters as appropriate.

Amend section 3.5.7 as follows:

3.5.7 Pulse Output Checks

a) Tests 3.5.7 b) and 3.5.7 c) are only required where the manufacturer has provided for a pulsed output.

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b) Verify that the Metering Equipment impulse output for kWh from voltage-free contacts is at a pulse rate of between 0.1 and 2 pulses per second at full load and that the duration of each pulse is a nominal 80ms.

c) Verify that the Metering Equipment 30 minute reset pulse is within a tolerance of ±0.2% (absolute) of the 30 minute Demand Period, from voltage-free contacts with a duration of between 0.5s and 10s.

3.5.7.1 Stored Data

a) Establish that the nameplate description "Six (a), (b), (c) & (d)" corresponds with the actual data storage capacity of the Outstation as specified in Code of Practice Six, Section 6.2.1.

b) The Metering Equipment shall be continuously energised at 50Hz ±0.1%, at full load (steady state conditions) for a period of 5 days and afterwards at a cyclic variable load for a further 15 days, determining the total number of kWh supplied to the Meter over the whole 20 day period.

c) On completion of energising the Meter under the above conditions, the following tests shall be carried out.

Verify that -

(i) at the end of each Demand Period over the 20 days the reading of the truncated absolute cumulative register in the range of 10's of kWh, kWh, 1/10 th's of kWh and 1/100 th's of kWh is correctly stored;

(ii) ——that for each Demand Period in the first 5 days, the reading of the truncated kWh cumulative register has advanced by a constant amount. Any variation should be noted together with any observation as to whether there is any pattern regarding such variation; and

(iii) any discrepancy between the measured value of Active Energy at each individual metering point and equivalent data presented by the Outstation for the same metering point shall not exceed ± 0.5% at full load at the metering point.

a) The Metering Equipment will then be run continuously for at least one additional day (or however many required to commence overwriting previously stored data) to ensure that Day n+1 values recorded at the end of the Demand Period only overwrite Day 1 values recorded at the end of the Demand Period and that no other data has been destroyed or corrupted.

(Note: In the case of Storage Categories (b), (c) & (d) it will be necessary to utilise the Metering Equipment with data pre-loaded by the Applicant.

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"Day n+1" is one day greater than the total number of days data storage capacity of the meter.)

b) Carry out a recorded number of Maximum Demand resets (one per Business Day for a period of 5 Business Days) and verify that this corresponds to the number of Maximum Demand resets recorded by the Meter.

3.5.7.2 Functional Tests

Whilst carrying out the tests specified in c~~C~~lauses 3.5.7.1 b) to 3.5.7.1 e) inclusive, verify, from the beginning of a current Demand Period, that twice kWh are being registered in the Maximum Demand register.

Verify that any energy that is measured during part of a Demand Period, and is not stored, is carried forward to the next Demand Period.

With the Metering Equipment connected to a supply, note the contents of all energy registers, and ensure that the time and date are set correctly to UTC. Disconnect the Metering Equipment from supply and, after 7 days in a de-energised state, verify that, on reconnecting the supply:-

(i) all data has been retained and is not corrupted;

(ii) all the data is correct;

(iii) the Metering Equipment internal clock is accurate within ±7 seconds of UTC or if fitted with a Broadcast clock that re-synchronisation occurs within 5 minutes of supply restoration;

(iv) the data for Demand Periods in which a Metering Equipment supply failure and / or restoration occurs and the data for Demand Periods where the supply is disconnected for the whole period are flagged such that it can be identified by the appropriate Instation; and.

(v) for the complete days that the supply is disconnected, the appropriate Days data is flagged as set out in Code of Practice Six, Section 6.2.1 (ii).

Verify that the Metering Equipment internal clock can be corrected within the limits specified in Code of Practice Six, Section 6.2.2 by communication with the relevant Instation, but once only during any Demand Period.

Verify that no switching between UTC and British Summer Time (BST) or any other Time Zone is possible for Settlement data stored in the Outstation.

Time the Demand Period set by the Metering Equipment when connected to a 50Hz ±0.1% supply and the clock is set (as appropriate) to:

(i) 'Mains' operation;

(ii) 'Crystal' operation; and

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(iii) 'Broadcast' operation, with the Metering Equipment shielded from incoming broadcasts;

and verify that:-

a) the duration is within ±2.0% of the specified Demand Period of 30 minutes (other than where the time has been corrected or synchronised to UTC in that Demand Period); and

b) the completion of each Demand Period is within ±20 seconds in 20 days.

For broadcast clocks also verify that the Metering Equipment complies with Code of Practice Six, Section 6.2.3.

Amend section 3.5.8 as follows:

3.5.8 Local Interrogation

Ensure that a local interrogation facility is provided which is an optical port conforming to BS EN 61107 and with a Data Protocol as defined in the Appendices of Code of Practice Six, and verify that data can be read using an Interrogation Unit.

Ensure that repeat collections of stored data are possible throughout the storage period and verify that any "read" operation shall not delete or modify any stored metering data.

Verify that the data transfer rate from the Outstation to the Interrogation Unit or PC achieves no less than 100 days' worth of data in 90 seconds, using the Protocol Tester. (Note: ensure that the Protocol Tester is not the limiting factor).

Determine if the Metering Equipment will

a) provide any portion of data stored in complete days, i.e. all metering data between any specified date and the current date; or

b) provide metering data from the start of a daily block, for any date or day number, up to, and including, the Demand Period preceding the time of interrogation; or

c) provide metering data only in daily blocks of 48 Demand Periods from any date(s) or day number(s),

upon request from an Interrogation Unit or PC.

Ensure that the data format and protocol submitted by the Applicant conforms to the requirements of Code of Practice Six, Section 6.4.1 and Appendices.

Ensure that for the purposes of transferring data to the relevant Instation a unique Outstation identification code is required.

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