WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Company Directive

STANDARD TECHNIQUE: TP14C

Distribution Business Provided Metering Facilities

Summary

This standard technique document details the metering facilities to be provided by the distribution business in order to enable the measurement of electricity transfers at defined metering points.

These facilities are to be provided only where the measurement of electricity requires the use of instrument transformers.

Equivalent metering facilities shall be provided by Independent Connections Providers on behalf of the distribution business where an electricity connection is to be subsequently adopted by Western Power Distribution.

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Policy Manager

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Document Revision & Review Table		
Date	**Comments**	**Author**
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1.0 INTRODUCTION

This standard technique document details the facilities to be provided by the distribution business in order to enable the measurement of electricity transfers at defined metering points.

These facilities are to be provided only where the measurement of electricity requires the use of instrument transformers.

These requirements also apply where an electricity connection is to be provided by an Independent Connections Provider and subsequently adopted by Western Power Distribution.

In the event of an inconsistency between the requirements contained within this document and the Balancing & Settlement Code and its associated Codes of Practice, the provisions of the Code shall prevail.

2.0 DEFINED METERING POINTS

Metering facilities are required at the following defined metering points:

(i) For electricity transfers between National Grid and Western Power Distribution where no other party (i.e. generator, transmission customer, other DNO) is connected to the busbar, the defined metering point shall be at the lower voltage side of each supergrid connected transformer NOTE 1, NOTE 2

(ii) For electricity transfers between National Grid and Western Power Distribution where other parties (i.e. generator, transmission customer, other DNO etc.) are connected to the busbar, the defined metering point shall be at the circuit connections to Western Power Distribution NOTE 1, NOTE 2

(iii) For electricity transfers between Western Power Distribution and another Distribution Network Operator not including a connection to a Transmission System, the defined metering point shall be at the point of connection of WPD and the other DNO NOTE 1, NOTE 3

(iv) For electricity transfers between Western Power Distribution and an Independent Distribution Network Operator (IDNO), the defined metering point shall be at the point of supply, except where the IDNO network comprises a single "unit" type (i.e. close-coupled) HV/LV substation, in which case the defined metering point shall be on the lower voltage side of the transformer NOTE 3, NOTE 4

(v) For electricity transfers between Western Power Distribution and a Customer (with or without generation), the defined metering point shall be at the point of connection to the WPD distribution network NOTE 5

NOTE 1: Each WPD distribution licence area has to be treated independently for metering purposes and consequently the reference to "Western Power Distribution" means a single distribution licence area. For the purposes of this document, another WPD distribution licence area sharing the same site is deemed to be another DNO

NOTE 2: Where a National Grid owned substation derives its auxiliary power from a part of the WPD network which is external to that substation then, for the purpose of that electricity transfer, National Grid is a "Customer" (see (v) above)

NOTE 3: For the purpose of this document, a DNO operating "out of area" is deemed to be an IDNO (see (iv) above)

NOTE 4: Boundary metering at the WPD / IDNO interface is not required when the interface is at LV - see POL: NC6 Independent Distribution Network Operators Embedded Networks for further details.

NOTE 5: There is no need for an auxiliary power supply to a WPD substation to be metered when it is derived from the Customer's network.

3.0 DISTRIBUTION BUSINESS PROVIDED FACILITIES

WPD shall provide the facilities detailed within this Standard Technique document where it owns the "upstream" network i.e. the network which is electrically closer to the transmission network.

At sites where there are electricity transfers between National Grid and Western Power Distribution the facilities will be provided by National Grid. Where the defined metering point is on the circuit connections to WPD it will be necessary for National Grid to make arrangements with WPD for the installation of the instrument transformers and associated secondary wiring within the WPD owned switch bay.

At sites where there are electricity transfers between Western Power Distribution and another Distribution Network Operator:

- Where the WPD owns the "upstream" network the facilities will be provided by WPD. It will be necessary for WPD to make arrangements with the other DNO for the installation of the instrument transformers and associated secondary wiring within the other DNO owned switch bay.
- Where the other DNO owns the "upstream" network the facilities will be provided by the other DNO. It will be necessary for the other DNO to make arrangements with WPD for the installation of the instrument transformers and associated secondary wiring within the WPD owned switch bay.

At sites where there are electricity transfers between Western Power Distribution and an Independent Distribution Network Operator the facilities will be provided by WPD. Where the IDNO network comprises a single "unit" type (i.e. close-coupled) HV/LV substation it will be necessary for WPD to pay for and make arrangements with the IDNO for the provision and installation of the instrument transformers and associated secondary wiring on the lower voltage side of the transformer.

At sites where there are electricity transfers between Western Power Distribution and a Customer, the facilities will be provided by WPD.

Supplementary Information

Whilst the appointment of a meter operator is outside the scope of this document, attention is drawn to the following points:

Generally it is the responsibility of the party being metered to appoint a meter operator. There are exceptions though and in order to avoid any doubt the following applies:

It is WPDs responsibility to appoint a meter operator where there are electricity transfers between National Grid and Western Power Distribution.

Where there are electricity transfers between Western Power Distribution and another Distribution Network Operator, the party who owns the "downstream" network is responsible for appointing a meter operator.

It is WPDs responsibility to appoint a meter operator where there are electricity transfers between Western Power Distribution and an Independent Distribution Network Operator.

Where there are electricity transfers between a Customer and Western Power Distribution it is the Customers responsibility to appoint a meter operator (normally done by the Electricity Supplier on their behalf).

WPD Smart Metering do not undertake metering on circuits with a rated capacity exceeding 100MVA (i.e. Code of Practice 1 metering)

4.0 COMMON REQUIREMENTS

This section describes the requirements which are common to all defined metering points. Later sections describe additional requirements which are conditional upon the rated circuit capacity.

4.1 Instrument Transformers

4.1.1 Current Transformers

Current transformers shall be of the inductive type (i.e. have a wound construction) and shall comply with the requirements of BS EN 60044-1. Electronic current transformers are not acceptable.

Current transformer primary windings shall be connected to the circuit being measured and on the "load" side of the metering voltage connections.

Where current transformers are installed within a "metering" circuit breaker or associated with a "metering" circuit breaker but separately mounted, the P1 terminal shall be electrically nearer to the circuit breaker contacts than the P2 terminal. In all other cases the P2 terminal shall be electrically nearer to the "load" than the P1 terminal.

Connections from all secondary terminals (S1, S2, S3) of each current transformer shall be brought out to an accessible position by means of separate insulated leads so that secondary wiring connections and/or star point can be easily changed.

The use of summation current transformers is not permitted.

Whilst the use of interposing current transformers should preferably be avoided, their usage is permitted provided the overall metering system accuracy is maintained.

The rated primary current shall be not less than the anticipated maximum demand and should ideally be not less than the rated circuit capacity. Any evaluation of maximum demand shall take into account any load growth which is reasonably foreseeable.

Guidance

The preferred approach when the anticipated maximum demand is significantly lower than the rated circuit capacity is for a dual ratio CT to be employed. The rated primary current on the higher ratio winding should be commensurate with the rated circuit capacity, and on the lower ratio winding proportionate to the anticipated maximum demand.

The rated secondary current shall be 1A except when associated with networks operating at voltages of 11kV and below, in which case a 5A rating shall be employed.

The total burden on each current transformer shall be between 25% and 100% of the rated burden. The total burden shall not exceed 100% of the rated burden under any circumstances.

4.1.2 Voltage Transformers

Voltage transformers shall be of the inductive type (i.e. have a wound construction) and shall comply with the requirements of BS EN 60044-2. Capacitor voltage transformers (CVTs) and electronic voltage transformers are not acceptable.

Voltage transformer primary windings shall be connected to the circuit being measured and on the "supply" side of the metering current transformers.

The rated primary voltage shall correspond to the rated system voltage at the location where the transformer is to be used. Where single-phase transformers connected between phase and neutral / earth are used the rated primary voltage shall be 1 / √3 times the rated system voltage.

The rated secondary voltage shall be 110V. Where single-phase transformers connected between phase and neutral / earth are used the rated secondary voltage shall be 110 / √3.

The total burden on each voltage transformer secondary winding shall be between 25% and 100% of the rated burden. The total burden shall not exceed 100% of the rated burden under any circumstances.

4.1.3 Combined Current & Voltage Transformers

The use of combined current and voltage transformers is acceptable.

Where a combined current and voltage transformer is proposed:

(i) The current transformer shall comply with the common requirements for current transformers described in 2.2.1 above, and with the additional requirements described in 3.1.1, 3.2.1, 3.3.1 and 3.4.1 below, where appropriate.

(ii) The voltage transformer shall comply with the common requirements for voltage transformers described in 2.2.2 above, and with the additional requirements described in 3.1.2, 3.2.2, 3.3.2 and 3.4.2 below, where appropriate.

Combined current and voltage transformers shall also comply with the requirements of BS EN 60044-3. In particular, the additional requirements specified in Clause 11, covering mutual influence effects on errors, shall be met.

4.1.4 Test Certificates

Instrument transformer test certificates showing errors at burdens which enable the working burden errors to be calculated shall be provided for each current and voltage transformer.

In addition, the following instrument transformer errors shall also be provided, which shall be obtained either by additional testing or by calculation using other error test results:

(i) Current transformer errors shall be supplied for each ratio at 5%, 20%, 100% and 120% rated current with a connected burden of 2.5VA 0.9 power factor or 7.5VA 0.9 power factor for transformers with a 1A and 5A secondary winding rating respectively

(ii) Voltage transformer errors shall be supplied with a connected burden of 10VA 0.5 power factor

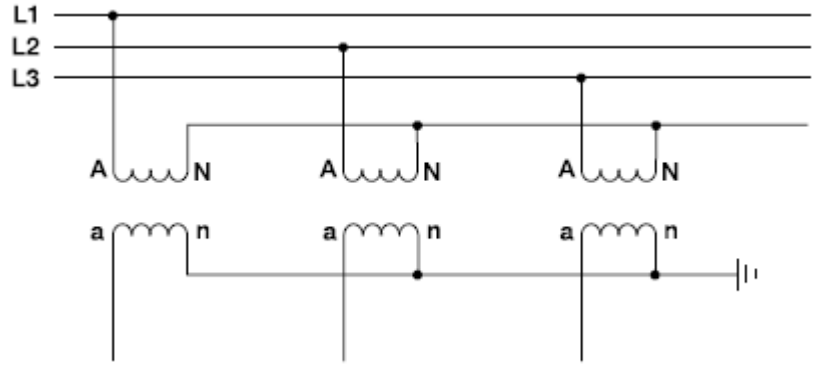
4.2 Instrument Transformer Secondary Circuits

4.2.1 Current Transformer Star Point

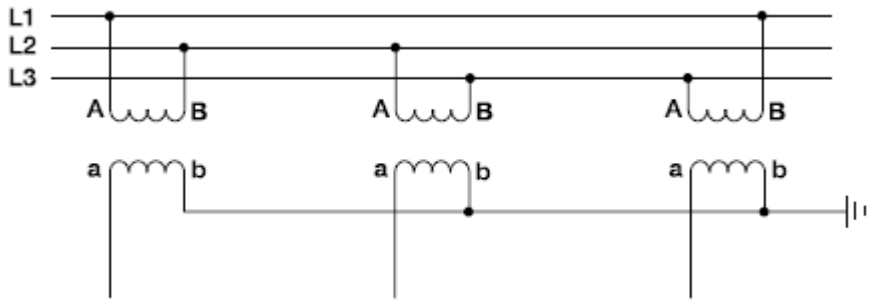
The star point shall be made by interconnecting the current transformer secondary terminals which have the same instantaneous polarity as the primary terminals which are electrically closest to the “load” being metered.

4.2.2 Voltage Transformer Star Point

Voltage transformers with the primary winding connected phase to neutral shall have the star point made by interconnecting the voltage transformer secondary terminals marked “n”.



Voltage transformers with the primary winding connected phase to phase shall have the star point made by interconnecting the voltage transformer secondary terminals which have a voltage lagging the other terminal by 120 degrees.



4.2.3 Functional Earthing

Instrument transformer secondary circuits shall be connected to earth at a single point, which shall be at position which is:

- As close to the transformer secondary winding as is reasonably practicable
- Accessible without leaving ground / floor level
- Accessible with the primary windings energised at network voltage

The connection to earth shall be on the transformer side of any test terminal block or VT secondary fuse / link.

The connection to earth shall be effected via a twin stud terminal incorporating a sliding / separable feed through link with bolted connections in order to facilitate the carrying out of insulation resistance measurements during commissioning and maintenance activities.

Guidance

The preferred earth links are Weidmuller STL5 type twin stud terminals. Products from other manufacturers which offer equivalent functionality and robustness are acceptable.

4.2.4 Multi-Ratio Current Transformers

Unused taps on multi-ratio current transformer secondary winding must be left open circuit.

4.2.5 Spare Instrument Transformer Secondary Windings

Spare current transformer secondary windings shall have a short-circuited applied between the highest ratio secondary terminals. The secondary circuit shall be connected to earth at a single point in accordance with 2.3.3 above.

Spare voltage transformer secondary windings must be left open circuit. The secondary circuit shall be connected to earth at a single point in accordance with 2.3.3 above.

4.2.6 Fuses And Links For Voltage Transformer Secondary Circuits

Fully shrouded fuse-holders with a 20A current rating and suitable for use with BS 88 Part 6 type F1 fuse-links shall be provided in both phase and neutral connections:

(i) As close as practicable to the voltage transformer secondary winding, and

(ii) Immediately adjacent to the metering equipment (i.e. to provide a local means of isolation)

Fuse-holders in phase connections shall be black in colour and the carrier shall be equipped with a fuse-link. Fuse-holders in neutral connections shall be white in colour and the carrier shall be equipped with a solid link. 6A fuse-links shall be employed close to the VT secondary winding and 2A fuse-links shall be employed adjacent to the metering equipment.

Non-metering-related burden shall be supplied via fuse-holders which are independent of those supplying metering circuits.

Guidance

Preferred fuse-holders are the 20A "Red Spot" type. Equivalent products from other manufacturers are acceptable.

Fuses have the potential to introduce high volt drop errors into metering circuits. Fuses with a low current rating tend to have a relatively high resistance value, which is variable from fuse to fuse. Careful selection of fuses and fuse holders can be used to mitigate these effects.

4.2.7 Multicore Auxiliary Cables

Multicore auxiliary cables shall be used to interconnect instrument transformers to the test terminal block / local means of isolation.

Multicore auxiliary cables shall be suitable for use on circuits having a working voltage up to and including 600/1000V, have copper conductors with a cross sectional area of not less than 2.5mm^2, single wire armouring and a PVC oversheath. Cables shall meet the requirements of either BS 7870 Part 8.1 or Part 8.3.

Guidance

Consideration shall be given to the following points when using multicore cables with a long cable run:

a) In current transformer secondary circuits, the cabling resistance is likely to represent an appreciable component of the overall burden and care should be taken to ensure that the CT rated burden is not exceeded. Using 4mm^2 conductors, or doubling of cores on cables with 2.5mm^2 conductors, can be used to mitigate this effect.

b) In voltage transformer secondary circuits, the cabling resistance can introduce high volt drop errors. Using 4mm^2 conductors, or doubling of cores on cables with 2.5mm^2 conductors, can be used to mitigate this effect.

c) The proximity of CT and VT signals can cause errors due to capacitive coupling from the voltage to the current circuits. The effect of this coupling is more prevalent at low loads with long cable runs, in particular where 1 amp rated CTs are employed. One possible symptom of this condition is that the meters may advance under no load conditions (i.e. circuit energised but with

no load current). This coupling effect may be eliminated by running CT and VT signals in separate auxiliary cables.

4.2.8 Test Terminal Block

A test terminal block shall be provided immediately adjacent to the metering equipment in order to enable meters to be routinely tested and/or changed safely with the circuit energised and carrying load current.

A separate test terminal block shall be provided for the main and check meters where these are supplied from discrete current transformers. A single test terminal block shall be provided where the main and check meters are supplied from a common current transformer.

Guidance

Test terminal blocks manufactured by Owen Brothers Metering UK Ltd are preferred. Products from other manufacturers which offer equivalent functionality and robustness are acceptable.

4.2.9 Wire Identifiers (Ferruling)

Wire identifiers shall comply with the requirements of ENA TS 50-19.

Each wire shall have an identifier comprising a letter to denote its function followed by a number identifying the individual wire. The wire identifier shall read from the termination outwards. Wire identifiers shall be provided at both ends of the wire, except where wire is less than 100mm long and is visible for its entire length, in which case an identifier shall be provided at one end only.

Current transformer secondary circuits associated with metering equipment shall use the letter “D” and voltage transformer secondary circuits associated with metering equipment shall use the letter “E”.

The following numbers shall be employed:

- 10 to 29 for wires associated with L1 phase
- 30 to 49 for wires associated with L2 phase
- 50 to 69 for wires associated with L3 phase
- 70 to 89 for wires associated with residual / neutral connections
- 90 for wires directly connected to the earth bar

Every branch of any connection shall bear the same number, however, the number shall increment each time the circuit passes through a piece of apparatus other than a terminal block (e.g. fuse-holder, switch, relay, meter etc.).

Guidance

“10”, “30” & “50” shall be used for the individual phase connections to the instrument transformer secondary windings on the star point side of the winding, reverting to “70” once the star point has been reached.

"11", "31" & "51" shall be used for the individual phase connections to the instrument transformer secondary windings on the side remote from the star point.

The preferred approach is for even numbers to be employed on the residual / neutral side of instrument transformer secondary circuits (e.g. D70, D72, D74 etc.) and for odd numbers to employed on the phase connections (e.g. D11, D13, D15 etc.).

4.3 Security Seals

Distribution equipment shall be sealed following initial energisation and shall be resealed following any subsequent works that require the removal of seals. The party carrying out such works shall be responsible for resealing equipment and for taking the removed seals from the site and destroying them, whether they are owned by that party or are the property of another party.

Cut-Out	(CT operated metering only)
Test Terminal Block	
Current Transformer Circuits	• CT Chamber • CT Terminal Cover • CT Marshalling Box
Voltage Transformer Circuits	• VT Racking (withdrawable VTs only) • VT Disconnecting Switch (isolatable VTs only) • VT Chamber • VT Secondary Fuses & Links (immediately adjacent to the VT) • VT Secondary Fuses (immediately adjacent to the metering euipment) • VT Marshalling Box • Primary voltage fuse • Secondary Voltage Fuse

4.4 Metering Label

A label shall be provided at each metering point in order to furnish relevant instrument transformer data to the Meter Operator, BSC Technical Assurance Agent and any other relevant party. The label will, in most circumstances, negate the need for these organisations to obtain the information directly from equipment rating plates, which are often inaccessible with the connection energised.

The provision of the metering label is mandated under the Meter Operation Code Of Practice Agreement (MOCOPA), to which Western Power Distribution is a signatory. The requirement to provide a label came into effect on 1st January 2012.

The metering label shall be completed by the WPD engineer responsible for either the commissioning or adoption of the installation.

The label shall be fixed / adhered to the inside of the metering cabinet door or placed adjacent to the Test Terminal Block (TTB) at the meter position. The former is the preferred option as it helps avoid unauthorised tampering / removal, or fading of the information due to a combination of direct light and time.

The label shall be completed and fixed in position before initial energisation of any new or modified metering installation.

An example of the label, along with its Shops Code, is included in Supplement B.

4.5 Register of Instrument Transformer Test Certificates

WPD Smart Metering is the custodians of metering CT and VT test certificates for all four WPD distribution licence areas. A copy of all the test certificates pertaining to a defined metering point along with a completed copy of the form in Supplement A shall be sent to WPD Smart Metering for inclusion on the register. The contact details are as follows:

LICENCE AREA	CONTACT DETAILS
East Midlands	Email to: rcook@westernpower.co.uk Post to: Ron Cook Registrar for Metering CT & VT Test Certificates WPD Smart Metering Toll End Road Tipton West Midlands DY4 0HH
South Wales	Email to: prowley@westernpower.co.uk Post to: Paul Rowley Registrar for Metering CT & VT Test Certificates WPD Smart Metering Lamby Way Rumney Cardiff CF3 2EQ
South West	Email to: pdougan@westernpower.co.uk Post to: Paul Dougan Registrar for Metering CT & VT Test Certificates WPD Smart Metering Feeder Road Bristol BS2 0TB

West Midlands	Email to: rcook@westernpower.co.uk Post to: Ron Cook WPD Smart Metering Toll End Road Tipton West Midlands DY4 0HH

5.0 ADDITIONAL REQUIREMENTS

The following sections describes the requirements which are in addition to the common requirements specified in Section 2 above and which are conditional upon the rated circuit capacity.

The rated circuit capacity shall be determined by the lowest rated item of primary plant (e.g. switchgear, current transformer, transformer, line, cable etc.) on the circuit being metered. Continuous rather than cyclic ratings shall be used for this assessment.

Guidance

Additional requirements are dependent upon the rated circuit capacity, not the authorised supply capacity.

Where multiple circuits are to be metered at a particular location, the rated circuit capacity means the capacity of each individual circuit rather than the combined capacity of all circuits.

For example, consider four 40MVA circuits supplying a major customer. The metering facilities on each circuit will be subject to the requirements of a 40MVA rated circuit capacity, not 160MVA.

5.1 Circuits With A Rated Capacity Not Exceeding 1MVA

This section describes the additional requirements which are applicable when the rated circuit capacity does not exceed 1MVA. Metering arrangements on these circuits must comply with the Balancing & Settlement Code - Code of Practice Five.

5.1.1 Current Transformers

One set of current transformers with a standard accuracy class of 0.5 or better shall be provided.

The current transformer should preferably be dedicated exclusively to metering, however, it may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

5.1.2 Voltage Transformers

A voltage transformer with one secondary winding with a standard accuracy class of 1.0 or better shall be provided except in the case of Low Voltage CT operated metering where no VT is required.

The voltage transformer should preferably be dedicated exclusively to metering, however, it may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

5.2 Circuits With A Rated Capacity Exceeding 1MVA But Not Exceeding 10MVA

This section describes the additional requirements which are applicable when the rated circuit capacity exceeds 1MVA but does not exceed 10MVA. Metering arrangements on these circuits must comply with the Balancing & Settlement Code - Code of Practice Three.

5.2.1 Current Transformers

One set of current transformers with a standard accuracy class of 0.5 or better shall be provided.

The current transformer should preferably be dedicated exclusively to metering, however, it may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

5.2.2 Voltage Transformers

A voltage transformer with one secondary winding with a standard accuracy class of 1.0 or better shall be provided.

The voltage transformer should preferably be dedicated exclusively to metering, however, it may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

5.3 Circuits With A Rated Capacity Exceeding 10MVA But Not Exceeding 100MVA

This section describes the additional requirements which are applicable when the rated circuit capacity exceeds 10MVA but does not exceed 100MVA. Metering arrangements on these circuits must comply with Balancing & Settlement Code - Code of Practice Two.

5.3.1 Current Transformers

One or two sets of current transformers with a standard accuracy class of 0.2S or better shall be provided.

Where one set of current transformers is available it shall supply both the "main" and "check" meters and shall be used exclusively for that purpose.

Where two sets of current transformers are available:

- One set shall supply the "main" meters and shall be used exclusively for that purpose
- The second set shall supply the "check" meters and may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

Guidance

The preferred approach is for one set of current transformers to be provided which is used exclusively for "main" and "check" metering purposes.

5.3.2 Voltage Transformers

A voltage transformer with one or two secondary windings shall be provided. Secondary windings shall have a standard accuracy class of 0.5 or better.

Where one secondary winding is available it shall supply both the "main" and "check" meters and shall be used exclusively for that purpose.

Where two secondary windings are available:

- One winding shall supply the "main" meter and shall be used exclusively for that purpose
- The second winding shall supply the "check" meters and may be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden

Guidance

The preferred approach is for one secondary winding to be provided which is used exclusively for "main" and "check" metering purposes.

5.3.3 Voltage Transformer Secondary Circuit Arrangements

The voltage transformer secondary circuit arrangement depends on whether the length of the multicore auxiliary cable between the transformer and the test terminal block exceeds 30 metres.

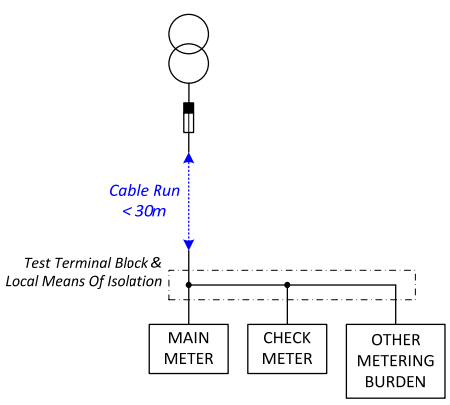
Guidance

The maximum permitted length of the multicore cable will be determined by burden / volt-drop considerations (see Sections 2.2.2 & 2.3.7 above).

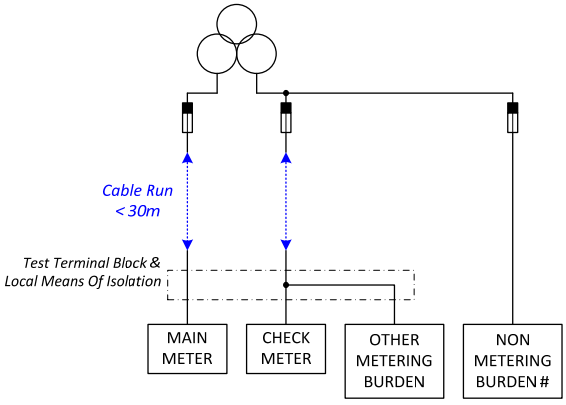
(a) Auxiliary Cable Run Not Exceeding 30 Metres

Communal connections may be employed between the VT secondary winding and the test terminal block when the multicore auxiliary cable run does not exceed 30 metres in length, as illustrated in the following diagrams. Note that the connections associated with the neutral conductor and the two other phases have been omitted for clarity.

VT WITH ONE SECONDARY WINDING



VT WITH TWO SECONDARY WINDINGS

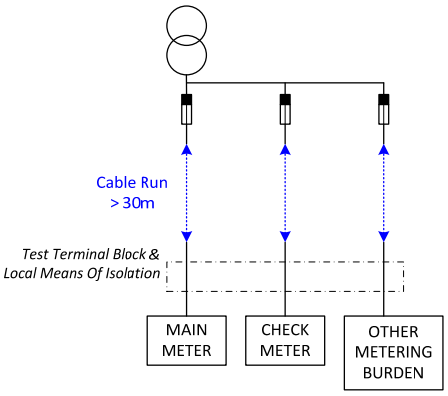


Where Applicable

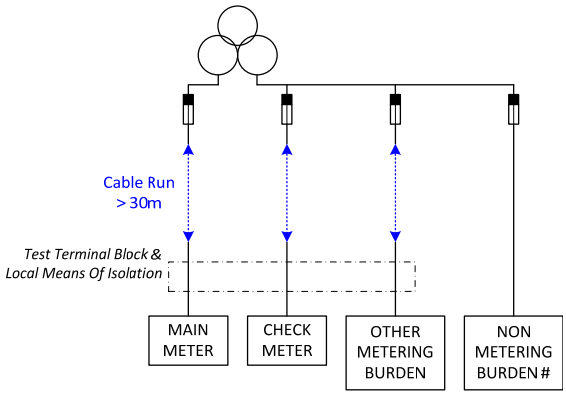
(b) Auxiliary Cable Run Exceeding 30 Metres

Independent connections shall be employed between the VT secondary winding and the test terminal block when the multicore auxiliary cable run exceeds 30 metres in length, as illustrated in the following diagrams. Note that the connections associated with the neutral conductor and the two other phases have been omitted for clarity.

VT WITH ONE SECONDARY WINDING



VT WITH TWO SECONDARY WINDINGS



Where Applicable

5.4 Circuits With A Rated Capacity Exceeding 100MVA

This section describes the additional requirements which are applicable when the rated circuit capacity is greater than 100MVA. Metering arrangements on these circuits must comply with the Balancing & Settlement Code - Code of Practice One.

5.4.1 Current Transformers

Two sets of current transformers with a standard accuracy class of 0.2S or better shall be provided.

For multi-ratio transformers (i.e. where there are tappings on the secondary winding), the minimum accuracy requirements shall be fulfilled for all transformation ratios.

One set of current transformers shall supply the "main" meters and shall be used exclusively for that purpose.

The second set of current transformers shall supply the "check" meters and may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden.

Guidance

The preferred approach is for the second set of current transformers to be used exclusively for "check" metering purposes.

5.4.2 Voltage Transformers

Two voltage transformers with one secondary winding each, or one voltage transformer with two separate secondary windings, shall be provided. Secondary windings shall have a standard accuracy class of 0.2 or better.

The interdependence between windings shall be taken into account when one voltage transformer with two separate secondary windings is employed. Each winding shall fulfil the minimum accuracy requirement whilst at the same time the other winding is supplying a burden of any value from 25% to 100 % of its rated output.

One voltage transformer secondary winding shall supply the “main” meter(s) shall be used exclusively for that purpose.

The second voltage transformer secondary winding shall supply the “check” meter(s) and any other metering system burden. It may also be used for other purposes provided the overall accuracy of the metering system is not compromised. The magnitude of any non-metering-related burden shall be clearly stated and supporting evidence shall be made available to Meter Operators and/or Technical Assurance Agents on request. Prior notification shall be given to the Meter Operator before altering any non-metering-related burden.

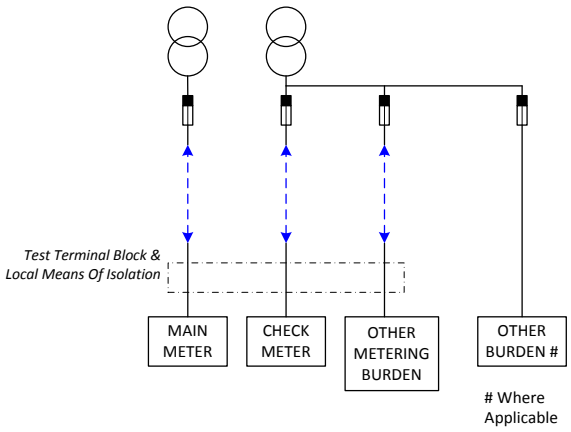
Guidance

The preferred approach is for the second voltage transformer secondary winding to be used exclusively for “check” metering purposes.

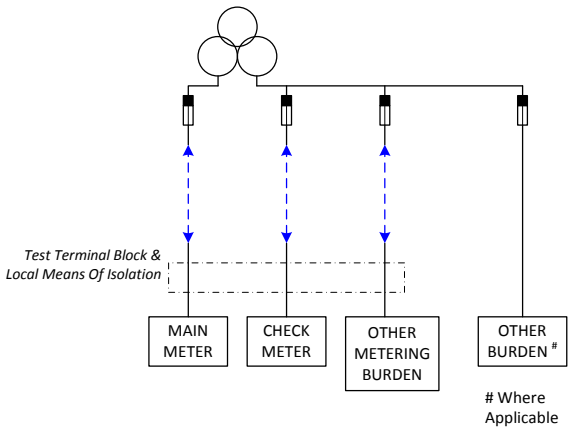
5.4.3 Voltage Transformer Secondary Circuit Arrangements

Separate connections shall be provided between the VT secondary winding and the test terminal block for the main meter, check meter and other metering burden, as illustrated in the following diagrams. Note that the connections associated with the neutral conductor and the two other phases have been omitted for clarity.

VTs WITH ONE SECONDARY WINDING



VT WITH TWO SECONDARY WINDINGS



SUPPLEMENT A FORM FOR REGISTRATION OF CT & VT TEST CERTIFICATES

A completed copy of this form along with copies of CT and VT test certificates shall be sent to the Registrar for Metering CT & VT Test Certificates, WPD Smart Metering.

METERING POINT DETAILS		
WPD Distribution Licence Area:	**East Midlands**	
	South Wales	
	South West	
	West Midlands	
Voltage:	**132kV**	
	66kV	
	33kV	
	25kV	
	11kV	
	6.6kV	
	LV	
MPAN Number:		
Address:		
	Post Code:	

TEST CERTIFICATE DETAILS	
Number of CT Test Certificates Attached:	
Number of VT Test Certificates Attached:	

SENDER DETAILS	
Name:	
Job Title:	
Team:	
Depot:	
Date:	

SUPPLEMENT B METERING LABEL

A pro forma label for metering CTs and VTs is shown below.

The label is not a stores item and should be ordered direct from the supplier using Shops Code 42723.

Voltage/Current Transformer Information

VT/CT	Phase	Manufacturer	Serial Number	Single/Dual/Multi (Ratios Availble)	Rating (VA)	Class	Ratio (Connected)
VT	L1						
VT	L2						
VT	L3						
CT	L1						
CT	L2						
CT	L3						

Distributor Company: **Installation/Commissioning Engineer:**

Date:

APPENDIX A

SUPERSEDED DOCUMENTATION
None

APPENDIX B

ANCILLARY DOCUMENTATION

POL: TP14 Electricity Metering Interface
POL: NC6 Independent Distribution Network Operators Embedded Networks

APPENDIX C

IMPLEMENTATION

There is no retrospective action required on the existing distribution system as a result of this policy.

The metering facilities at an existing installation must be modified to comply with these requirements where a material change takes place. Changes are considered to be material where they constitute a change to the primary plant associated with a metering system i.e. the instrument transformers.

Where any difficulty is encountered in the application of this policy, the company's Technical Policy Manager should be notified, who will consider whether an application specific concession or an amendment to this document is appropriate.

APPENDIX D

IMPACT

This standard technique is relevant to all staff involved with safety, technical and business interface related matters at the electricity metering interface.

APPENDIX E

KEYWORDS

Metering; Current Transformers; Voltage Transformers; Balancing & Settlement Code;

APPENDIX F

DOCUMENT LAST REVIEWED

May 2013.