# CODE OF PRACTICE FIVE

CODE OF PRACTICE FOR THE METERING OF ENERGY TRANSFERS WITH A MAXIMUM DEMAND OF UP TO (AND INCLUDING) 1MW COVERED BY THE POOLING AND SETTLEMENT AGREEMENT

## Issue 1

Version 1.00

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# Code of Practice Five

**CODE OF PRACTICE FOR THE METERING OF ENERGY TRANSFERS WITH A MAXIMUM DEMAND OF UP TO (AND INCLUDING) 1MW COVERED BY THE POOLING AND SETTLEMENT AGREEMENT.**

1. Reference is made to the Pooling and Settlement Agreement for the Electricity Industry in England and Wales dated 30th March 1990, and as amended and restated in 16th November 1992 and, in particular, to the definitions of "Code of Practice" and "Synopsis of Metering Codes" in clause 1.1 thereof.

2. Attached is a copy of Code of Practice Five Issue 1 version 1.00

3. This Code of Practice is to be effective from 1 April 1993.

4. This Code of Practice has been approved by the Executive Committee, the Settlement System Administrator, the Ancillary Service Provider and the Suppliers in separate general meeting.

Margaret Thompson

For and on behalf of the Executive Committee.

R. J. C...

For and on behalf of Suppliers.

T. A. Malin

For and on behalf of the NGC Settlements Limited as Settlement System Administrator.

Colin J. ...

For and on behalf of the Ancillary Service Provider.

# AMENDMENT RECORD

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# CODE OF PRACTICE FOR THE METERING OF ENERGY TRANSFERS WITH A MAXIMUM DEMAND OF UP TO (AND INCLUDING) 1MW COVERED BY THE POOLING AND SETTLEMENT AGREEMENT

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FOREWORD

This Code of Practice relates to the Metering Equipment required for electricity transfers at Defined Metering Points where the Maximum Demand does not exceed 1MW.

This Code of Practice defines the essential minimum Metering Equipment requirements that must be met in all instances.

Where this Code of Practice is not complied with by a Party, then a Dispensation Application shall be made to the Executive Committee who shall determine whether or not such Party shall comply. The form of the Dispensation Application shall be as determined by the Executive Committee.

NGC Settlements Limited, as Settlement System Administrator ("SSA") shall retain copies of, inter alia, the Code of Practice together with copies of all documents referred to in them, in accordance with the provisions of the Pooling and Settlement Agreement ("P&SA").

## 1. SCOPE

This Code of Practice states the practices that shall be employed, and the facilities that shall be provided for the measurement and recording of the quantities required for Settlement.

This Code of Practice specifically applies to the Metering Equipment to be installed on each circuit where the Maximum Demand of the electricity being transferred does not exceed 1MW. Where summation current transformers are being utilised the references in the text to "each circuit" shall be interpreted as the output from each summation current transformer.

This Code of Practice applies equally to "whole current" metering and metering supplied via measurement transformers operating at high or low voltages.

It derives force from the metering provisions (Clause 56) of the P&SA, to which reference should be made. It should also

be read in conjunction with the relevant Agreed Procedures for, inter alia, operation of the data collection systems.

This Code of Practice does not contain the calibration, testing and commissioning requirements for Settlement Metering. These requirements are detailed in Code of Practice Four - "Calibration, Testing and Commissioning Requirements for Metering Equipment registered with the Settlement System Administrator".

In the event of an inconsistency between the provisions of this Code of Practice and the P&SA, the provisions of the P&SA shall prevail.

## 2. REFERENCES

The following documents are referred to in the text:-

| | |
|---|---|
| IEC Standard 1036 | Alternating Current Static Watt-Hour Meters for Active Energy (Classes 1 and 2) |
| BS 5685 : Part 1 | Electricity Meters - Class 0.5, 1 and 2 Single-Phase and Polyphase, Single Rate and Multi-Rate Watt-Hour Meters |
| Draft IEC Standard | Alternating Current Static Var-Hour Meters (Classes 2 and 3) produced by IEC TC13/WG11 |
| BS 5685 : Part 4 | Specification for Class 3 Var-Hour Meters |
| IEC Standard 185 | Current Transformers |
| IEC Standard 186 | Voltage Transformers |
| IEC 1107 | Data Exchange for Meter Reading, Tariff and Load Control. Direct Local Exchange. |

Consultative Committee International Telegraphs and Telephony Recommendations:-

| | | |
|---|---|---|
| CCITT V24 | - | List of definitions for interchange circuits between data terminal equipment and data circuit - terminating equipment (i.e. modem). |
| CCITT V28 | - | Electrical characteristics for unbalanced double current interchange circuits. |
| Code of Practice Four | | Calibration, Testing and Commissioning Requirements for Metering Equipment registered with the Settlement System Administrator. |
| Pooling and Settlement Agreement (P&SA) | | Clause 56 and Agreed Procedures |
| Electricity Act 1989 | | Schedule 7 |

## 3. DEFINITIONS AND INTERPRETATIONS

Save as otherwise expressly provided herein, words and expressions used in this Code of Practice shall have the meanings attributed to them in the P&SA.

Except where otherwise specified herein, the definitions in British Standards 205, 1991 and 4727 Part 1, and British Standards for equipment shall apply as appropriate.

The following definitions are included for the purposes of clarification within this document.

Definitions marked with an asterisk (*) are taken from the P&SA without modification. Definitions marked with a double asterisk(**) are based on P&SA definitions with slight modification, but do not infer any change of meaning.

### 3.1 Active Energy **

Active Energy means the electrical energy produced, flowing or supplied by an electrical circuit during a time interval, and being the integral with respect to time of the instantaneous power (having regard to the separate definitions of Export and Import in 3.11 and 3.12 respectively), measured in units of watt-hours or standard multiples thereof, that is:-

1,000 Wh = 1 kWh
1,000 kWh = 1 MWh
1,000 MWh = 1 GWh
1,000 GWh = 1 TWh

3.2 Active Power **

Active Power means the product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof, that is:-

1,000 Watts = 1 kW
1,000 kW = 1 MW
1,000 MW = 1 GW
1,000 GW = 1 TW

3.3 Actual Metering Point

The physical location at which electricity is metered.

3.4 Central Data Collection System (CDCS)

The computer system located at a central point which contains a national data base which is regularly updated from the Settlement Instations to which it has dedicated communications links.

3.5 CTN

The Electricity Supply Industry (ESI) corporate telephone network.

3.6 Defined Metering Point

The physical locations at which the overall accuracy requirements as stated in this Code of Practice are to be met. These locations are identified in Appendix A.

3.7 Demand Period

The period over which Active Energy and Reactive Energy are integrated to produce Demand Values. For Settlement purposes each Demand Period is of 30 minutes duration, one of which shall finish at 24:00 hours.

3.8 Demand Values

Twice the average value of kWh or kVAh over a Demand Period. The Demand Values are half hour demands and these are identified by the time of the end of the Demand Period. Demand Value includes pulse counts multiplied by twice the Units Per Pulse.

3.9 Dispensation Application

An application in the form agreed by the Executive Committee.

3.10 electricity *

"electricity" means Active Energy and/or Reactive Energy.

3.11 Export **

"Export" means, in respect of any Party, a flow of electricity from the Plant or Apparatus of such Party to the Plant or Apparatus of another Party and, in relation to any Party which is an External Pool Member, the External Interconnection in respect of which that Party has the right to deliver or take electricity to or from the NGC Transmission System shall be treated as the Plant or Apparatus of such Party and the verb "Export" and its respective tenses shall be construed accordingly;

For the purposes of this Code of Practice, Export means an electricity flow in the opposite direction to Import.

3.12 Import **

"Import" means, in respect of any Party, a flow of electricity to the Plant or Apparatus of such Party from the Plant or Apparatus of another Party and, in relation to any Party which is an External Pool Member, the External Interconnection in respect of which it has the right to deliver or take electricity to or from the NGC Transmission System shall be treated as the Plant or Apparatus of such Party and the verb "Import" and its respective tenses shall be construed accordingly;

For the purposes of this Code of Practice, Import means an electricity flow to the plant or apparatus of the Registrant or Customer from another Party to the P&SA.

3.13 Interrogation Unit

A Hand Held Unit "HHU" also known as Local Interrogation Unit "LIU" or portable computer which can enter Outstation parameters and extract information from the Outstation and store this for later retrieval.

3.14 Maximum Demand

Maximum Demand expressed in kW or kVA means twice the greatest number of kWh or kVAh recorded during any Demand Period.

3.15 Meter

A device for measuring electrical energy.

3.16 Metering Equipment **

Means meters, measurement transformers (both voltage and current), metering protection equipment including alarms, circuitry and their associated data collection outstations and wiring which are part of the Active Energy or Reactive Energy measuring equipment at or relating to a point(s) of connection.

3.17 Meter Register

A device, normally associated with a meter, from which it is possible to obtain the amount of Active Energy, or the amount of Reactive Energy that has been supplied by a circuit.

3.18 Metering System **

Means all the Metering Equipment linked to a single data collection outstation at, and in relation to, any point(s) of connection and includes, for the avoidance of doubt, such data collection outstation.

3.19 Outstation

On-site equipment which receives and stores data from a meter(s), and may perform some processing of the data before transmitting the metering data to the Settlement Instation on request. These functions can be facilitated in one or more separate units or be integral with the Meter.

3.20 PSTN

The public switched telephone network.

3.21 Rated Measuring Current

The rated primary current of the current transformers for the purposes of measurement.

3.22 Reactive Energy **

Reactive Energy means the integral with respect to time of the Reactive Power, (having regard to the separate definitions of Export and Import in 3.11 and 3.12 respectively).

3.23 Reactive Power *

Reactive Power means the product of voltage and current and the sine of the phase angle between them measured in units of voltamperes reactive and standard multiples thereof, that is:-
1,000 var = 1 kvar
1,000 kvar = 1 Mvar

3.24 Settlement Instation

A computer based system with a database of all the Outstations for which it collects or receives data on a routine basis.

3.25 Second Tier Data Collection System (STDCS) *

"Second Tier Data Collection System" means those parts of the Settlement System which relate to the obligations of the Settlement System Administrator under this Agreement in relation to collecting, estimating and aggregating data as may be required for the proper functioning of Settlement from Metering Systems at the point of connection between the Distribution System of a Public Electricity Supplier and:-

(i) a Second Tier Customer;

(ii) the System of an Authorised Electricity Operator other than the Public Electricity Supplier;

(iii) an Embedded Generator not subject to Central Despatch; and

(iv) the Distribution System of another Public Electricity Supplier,

and providing such data to the Settlement System Administrator;

## 4. METERING EQUIPMENT CRITERIA

Although for clarity the specification identifies separate items of equipment, nothing in this Code of Practice prevents the items being combined to perform the same task provided the requirements of this Code of Practice are met.

Settlement Metering Equipment other than outdoor measurement transformers shall be accommodated in a clean and dry environment.

### 4.1 Measurement Transformers

The terms "current transformer" and "voltage transformer" used below do not preclude the use of other measuring techniques with accuracies to the required standards.

Where current and/or voltage transformers are used they shall meet the requirements set out in paragraphs 4.1.1 and 4.1.2 of this Code of Practice.

Where current and/or voltage transformers are used then a test block or equivalent facility shall be provided close to the meter(s).

Where current transformers are used on low voltage installations, the voltage supply to the meter shall be fused as close as practicable to the point of that supply.

For existing installations measurement transformers not complying fully with this Code of Practice may be used for the purpose of Settlement metering providing the requirements as detailed in paragraph 4.1.3 are met. Where subsequently a significant alteration to the primary plant (eg a switchgear change) is carried out, new measurement transformers as detailed in paragraph 4.1.1 and 4.1.2, shall be provided.

#### 4.1.1 Current Transformers

Where required, one set of current transformers (CT) to IEC Standard 185 with a minimum standard of accuracy class 0.5, shall be provided per circuit. Preferably the current

transformers shall be dedicated to Settlement metering, but where this is not the case, any additional burdens shall not be modified without obtaining the prior approval of the SSA.

Details of any other burdens and a CT test certificate or equivalent showing errors at the overall working burden or at burdens which enable the working burden errors to be predicted shall be available for inspection.

The total burden on current transformers shall not exceed their rating at the rated secondary current.

4.1.2 Voltage Transformers

Where required a voltage transformer (VT) to IEC Standard 186 with a minimum standard of accuracy class 1 shall be provided for the metering of a circuit. The voltage transformer may, where necessary, supply other burdens. Where a voltage transformer supplies other burdens these shall not be modified without obtaining the approval of the SSA.

Details of any other burdens and a VT test certificate showing errors at the overall working burden or at burdens which enable the working burden errors to be predicted shall be available for inspection.

The total burden on voltage transformers shall not exceed their rating at the rated secondary voltages.

The VT supplies to the meter(s) shall be fused. In addition any other burdens shall be separately fused.

Where there is a choice of VT supply to the Meter from a common bus bar then voltage selection relays shall be provided.

4.1.3 Existing Installations

For existing installations, the installed measurement transformers may be used irrespective of their accuracy class providing the overall accuracy requirements as defined in paragraph 4.2.2 are met.

Where measurement transformers supply burdens other than Settlement metering, these burdens shall not be modified without the prior approval of the SSA and evidence concerning the burdens shall be available for inspection by the SSA.

Separately fused VT supplies shall be provided for the meters and for any additional burden.

## 4.2 Meters

### 4.2.1 Measured Quantities

For each circuit the following energy measurements are required for Settlement purposes:-

(i) Import kWh.

(ii) Import kvarh.

Export metering need only be installed where a Party specifically requires this measurement.

### 4.2.2 Accuracy requirements

The overall accuracy of the energy measurements at or referred to the Defined Metering Point shall be within the limits of error as shown:-

(i) Active Energy

| CONDITION | LIMIT OF ERRORS AT STATED SYSTEM POWER FACTOR | |
|---|---|---|
| Current expressed as a percentage of Rated Measuring Current* | Power Factor | Limits of Error |
| 100% to 20% inclusive | 1.0 | ± 1.5% |
| Below 20% to 5% | 1.0 | ± 2.5% |
| 100% to 20% inclusive | 0.5 lag and 0.8 lead | ± 2.5% |

* for whole current metering percentage relates to $I_{max}$.

(ii) Reactive Energy

| CONDITION | LIMIT OF ERRORS AT STATED SYSTEM POWER FACTOR | |
|---|---|---|
| Current expressed as a percentage of Rated Measuring Current* | Power Factor | Limits of Error |
| 100% to 20% inclusive | Zero | ± 4.0% |
| 100% to 20% inclusive | 0.866 | ± 5.0% |

* for whole current metering percentage relates to $I_{max}$.

These limits of error for both (i) and (ii) above shall apply at the Reference Conditions defined in the appropriate Meter Standard.

Evidence to substantiate these overall accuracy requirements

shall be available for inspection by the SSA or his Second Tier Agent.

4.2.3 Compensation for Measurement Transformer Error

To achieve the overall accuracy requirements it may be necessary to compensate meters for the errors of the measurement transformers and the associated leads to the meters. Values of the compensation shall be recorded and evidence, usually including test certificates, shall be available for inspection to justify the compensation criteria.

4.2.4 Compensation for Power Transformer and Line Losses

Where the Actual Metering Point and the Defined Metering Point do not coincide and as a consequence, the overall accuracy at the Defined Metering Point is not met, then compensation for power transformer and/or line losses shall be provided. The compensation may be achieved either within the Metering Equipment or by software within CDCS or STDCS provided the overall accuracy at the Defined Metering Point is met.

Where compensation is applied the values used shall be recorded and supporting evidence shall be available for inspection to justify the compensation criteria.

The accuracy requirements of this Code of Practice does not include software compensation used to derived Consumer Grid Supply Point (CGSP) values.

4.2.5 Requirements

The meters supplied may be either static or induction disc types.

Active Energy meters shall meet the requirements of either IEC Standard 1036 or BS 5685 Part 1 for Class 2 meters.

Reactive Energy meters shall meet the requirements of either the draft IEC Standard or BS 5685 Part 4 for Class 3 meters.

Active Energy meters provided for the metering of Second Tier Supplies shall be approved in accordance with Schedule 7 of the Electricity Act, 1989.

Active Energy meters shall be configured such that the number of measuring elements is equal to or one less than the number of live conductors. In this context "live conductors" includes the neutral conductor, and/or the earth conductor where system configurations enable the flow of zero sequence energy.

Where appropriate, meters shall be labelled according to the criteria of Appendix B.

## 4.3 Displays and Facilities

### 4.3.1 Displays

The Metering Equipment shall have the ability to display the following information:

(i) total Import cumulative kWh per circuit;

(ii) total Import cumulative kvarh per circuit;

(iii) current time ("UTC") and date;

* (iv) Maximum Demand ("MD") for kW per programmable charging period, i.e. monthly or statistical review period;

* (v) Maximum Demand ("MD") for kVA per programmable charging period, i.e. monthly or statistical review period;

* (vi) twice the kWh advance since the commencement of a current Demand Period, (i.e. "kW rising demand");

* (vii) twice the kVAh advance since the commencement of a current Demand Period, (i.e. "kVA rising demand");

* (viii) cumulative MD;

* (ix) number of MD resets;

* (x) multi-rate display sequence as specified by Supplier, with a minimum of 8 rates selectable over the calendar year; and

  (xi) indication of reverse running for Active Energy where appropriate.

  MD shall be resettable at midnight of last day of charging period. Also resettable for part chargeable period demands. If a manual reset button is used then this shall be sealable.

* Where displays are marked with an asterisk the Registrant shall specify which displays are to be enabled.

4.3.2 Facilities

The Metering Equipment shall be capable of providing the following information locally to the Customer or Registrant:

(i) impulsing for kWh and either kVAh or kvarh - all to be voltage free contacts with a pulse rate at full load of between 0.1 and 2 pulses per second with a nominal duration of 80mS per pulse; and

(ii) a 30 minute reset pulse from voltage free contacts with a minimum duration of 0.5 second and a maximum duration of 10 seconds.

## 4.4 Outstation

An Outstation shall be provided which transfers data to and receives data from a Settlement Instation(s). An Outstation system can consist of either one or more separate Outstations or facilities integral with the energy meters.

Separate Outstations, storing data from a number of different circuits, and meters with integral Outstation facilities may be cascaded onto one communication channel.

The Outstation shall have the ability to allow the metering data to be read by instations other than the Settlement Instation provided the requirements of Section 6 of this Code of Practice are satisfied.

The Outstation protocol must be compatible with that of the Settlement Instation, which will collect and format the metering data for the Second Tier Data Collection System.

For the purpose of transferring stored metering data from the Outstation to the Settlement Instation, a unique Outstation identification code shall be provided.

If not integral with the meter, a separately fused supply shall be provided for each Outstation and where appropriate, the associated modem. Alternatively, in the case of modems, independently powered types may be used.

Where a measurement VT source is used and the Outstation is storing data for more than one circuit, a voltage selector relay scheme using each circuit involved shall be provided.

4.4.1 Data storage

Data storage facilities shall be provided as follows:-

(i) metering data shall either be in engineering units or pulse counts. If the latter, Unit Per Pulse information shall be provided to all those entitled to the data;

(ii) a storage capacity of 48 periods per day for 20 days for Import kWh measurements. The stored demands shall be integer multiples of kWh;

(iii) the resolution of the Active Energy transferred into the demand registers shall be within ±0.1% (at full load) of the amount of Active

Energy measured by the associated meter.

(iv) the value of energy measured but not stored in any Demand Period shall be carried forward to the next Demand Period;

(v) where Export metering is installed, similar facilities shall be provided;

(vi) where a separate outstation is used cumulative register values which can be set to match and increment with the Meter Registers shall be provided;

(vii) in the event of an Outstation supply failure, the Outstation shall protect all data stored up to the time of the failure, and maintain the time accuracy in accordance with paragraph 4.4.4;

(viii) partial demands, those in which an Outstation supply failure and/or restoration occurs, and zero demands associated with an Outstation supply failure, shall be marked so that the Settlement Instation can identify them;

(ix) to cater for continuous supply failures, the clock, calender and all data shall be supported for a period of 20 days without an external supply connected;

(x) any "read" operation shall not delete or alter any stored metered data; and

(xi) an Outstation shall provide any portion of the data stored upon request by an Instation.

4.4.2 Other functions

Time to be set to the Universal Time Clock "UTC" (also known as GMT). No switching between UTC and British Summer Time ("BST") is permitted.

Time correction or synchronisation during data retrieval or on request.

4.4.3 Monitoring Facilities

Monitoring facilities shall be provided for the following conditions and shall be reported to the Settlement Instation as an alarm indication, tagged to the relevant Demand Period(s), via online communications and the local Interrogation Unit:

(i) phase failure of any one or combination of phases;

(ii) device functionality, an error condition shall be alarmed;

(iii) battery monitoring (where battery fitted);

(iv) interrogation port access which changes data; and

(v) reverse running (if fitted).

4.4.4 Accuracy of Time Keeping

The long term time keeping accuracy required for Demand Periods shall be based upon the Outstation receiving a timing signal from the Settlement Instation or local Interrogation Unit which is synchronised to UTC.

The overall limits of error for the time keeping which must allow for failure to communicate with the Outstation for an extended period of 20 days shall be:-

(i) the commencement of each Demand Period shall be at a time which is within ± 20 seconds of UTC; and

(ii) the duration of each Demand Period shall be within ± 0.1%, except where time synchronisation or time correction has occurred in a Demand Period.

## 4.5 Communications

The Outstation shall accommodate both local and remote interrogation facilities, preferably from separate ports.

The reprogramming of data shall only be possible through access at a suitable security level.

The reading of data shall only be possible through access at a suitable security level.

The following metering data shall be transferrable on request during the interrogation process:-

(i) half hourly values of Active Energy;

(ii) total cumulative Active Energy;

(iii) total cumulative Reactive Energy;

(iv) Maximum Demand (MD) for kW or kVA per programmable charging period i.e. monthly, statistical review period;

(v) multi-rate cumulative Active Energy as specified by Supplier;

(vi) alarm indications; and

(vii) Outstation time.

### 4.5.1 Local Interrogation

An interrogation port shall be provided which preferably shall be an opto port to IEC 1107, and with a serial protocol such as IEC 1107, for the

following purposes:-

(i) transfer of metering data and alarms;

(ii) time error correction.

4.5.2 Remote Interrogation

An interrogation facility shall be provided for remote interrogation and it shall not be possible to disconnect this link at the Outstation without the breaking of a Settlement seal.

Any port for connection to external data communications equipment shall be compatible with CCITT V24 and CCITT V28.

Error checking facilities shall be provided between the Outstation and the Settlement Instation.

Interrogation of an Outstation shall be possible using one of the following media:

(i) Switched telephone networks e.g. PSTN or CTN;
(ii) Public data networks e.g. PSN;
(iii) Radio data networks e.g. Paknet or any equivalent;
(iv) Customer own network;
(v) Mains signalling / power line carrier;
(vi) Low power radio;
(vii) Satellite; or
(viii) Cable TV.

In addition to the foregoing, if the Party so wishes, any further method of interrogation approved by the SSA may be used.

## 5. ASSOCIATED FACILITIES

### 5.1 Settlement Instation

All operations carried out either manually or automatically shall be protected by a security system or by an operational log produced by the system, or both, according to the importance of the operation. The Settlement Instation shall maintain accurate time by interfacing with the Rugby radio clock and shall synchronise the Outstations during interrogation.

The Settlement Instation shall receive metering data from the Outstations and pass the data on to either the Second Tier Data Collection System or Central Data Collection System as instructed by the SSA. Data checks will include a Meter advance reconciliation comparison between the Meter cumulative register(s) for kWh only and the values as retrieved from the Outstations by the Settlement Instation. These checks will be performed in accordance with Clause 56 of the P&SA and Agreed Procedures.

### 5.2 Interrogation Unit

The Operator may interrogate the Outstations using an Interrogation Unit (IU) usually in the form of a portable computer. The Interrogation Unit may be used for commissioning, maintenance/fault finding and when necessary the retrieval of stored metering data. The data retrieved by the Interrogation Unit shall be compatible with the Settlement Instation.

### 5.3 Additional Features

Additional features may be incorporated within or associated with the Metering Equipment provided but these must not interfere with or endanger the operation of the Settlement process.

## 6. ACCESS TO DATA

Access to metering data shall be in accordance with the provisions of the P&SA and the Agreed Procedures referred to therein. Such access must not interfere with or endanger the security of the data or the collection process for Settlement purposes.

Access to stored metering data in Outstations shall also be the right of the Registrant and any party who has the permission of the Registrant.

## 7. DISPUTES

For the avoidance of doubt, the relevant clauses of the P&SA shall govern the procedure for notifying and settling disputes in respect of this Code of Practice.

## 8. SETTLEMENT REQUIREMENTS

For the avoidance of doubt, each Metering System must have a Registrant and Operator as required by the provisions of Clause 56.

# APPENDIX A

DEFINED METERING POINTS

For transfers of electricity between the following parties the Defined Metering Point (DMP) shall be at one of the following locations:-

1. For transfers between The National Grid Company plc and a single Public Electricity Supplier where no other Party(s) are connected to the busbar, the DMP shall be at the lower voltage side of the supergrid connected transformer.

2. For transfers between The National Grid Company plc and a single Public Electricity Supplier where other Party(s) are connected to the busbar, the DMP shall be at the circuit connections to the Public Electricity Supplier.

3. For transfers between The National Grid Company plc and more than one Public Electricity Supplier, the DMP shall be at the circuit connections to the Public Electricity Suppliers.

4. For transfers between Public Electricity Suppliers not including a connection to the transmission system of The National Grid Company plc, the DMP shall be at the point of connection of the two Public Electricity Suppliers.

5. For transfers between The National Grid Company plc and Generators, the DMP shall be at the high voltage side of the generator transformers and station transformer(s).

## APPENDIX A cont.

6. For transfers between Public Electricity Suppliers and Generators, the DMP shall be at the point(s) of connection of the generating station to the Public Electricity Supplier.

In the case of (5) and (6) above the following shall also apply:-

Each Generating Unit which is subject to Central Despatch shall have Metering Equipment which identifies uniquely the electricity transfers of the despatched unit. In the case of range Combined Cycle Gas turbines metering shall be installed on each Combined Cycle Gas Turbine Unit for aggregation in Settlement.

7. For transfers between the Distribution System of a Public Electricity Supplier and a Second Tier Supplier or Second Tier Customer, the DMP shall be at the point of connection to the Distribution System of the Public Electricity Supplier.

8. For transfers between The National Grid Company plc and a Second Tier Supplier or Second Tier Customer, the DMP shall be at the point of connection to The National Grid Company plc.

9. For transfers between The National Grid Company plc and Externally Interconnected Parties the DMP shall be as follows:-

(i) For the Scottish links, the busbar side of the busbar disconnectors at:-

(a) Harker 400 kV Substation
(b) Harker 275 kV Substation
(c) Harker 132 kV Substation
(d) Stella 275 kV Substation
(e) Stella 400 kV Substation

(ii) For the EDF link the busbar side of the busbar disconnectors at the Sellindge 400 kV Substation.

# APPENDIX B

LABELLING OF METERS FOR IMPORT AND EXPORT

1 A standard method of labelling meters, test blocks, etc is necessary and based on the definitions for Import and Export the required labelling shall be as follows.

2 ACTIVE ENERGY

Meters or Meter Registers shall be labelled "Import" or "Export" according to the electricity flow definitions as in paragraphs 3.12 and 3.11.

This convention is based on "Import" and "Export" being from the viewpoint of the Registrant of the Metering System.

3 REACTIVE ENERGY

Within the context of this code the relationship between Active Energy and Reactive Energy can best be established by means of the power factor. The following table gives the relationship:-

| Flow of Active Energy | Power Factor | Flow of Reactive Energy |
|---|---|---|
| Import | Lagging | Import |
| Import | Leading | Export |
| Import | Unity | Zero |
| Export | Lagging | Export |
| Export | Leading | Import |
| Export | Unity | Zero |

Meters or Meter Registers for registering Import Reactive Energy should be labelled "Import" and those for registering Export Reactive Energy should be labelled "Export".