



Settlement Metering for Offshore Wind Farms

Purpose

This guidance note clarifies the [Balancing and Settlement Code \(BSC\)](#) requirements for measuring and recording flows of electricity for Settlement purposes at Offshore wind farms that are subject to the Offshore Transmission Regime¹, i.e. Offshore wind farms that connect onshore to the Transmission System, or a Distribution System, where the Offshore transmission assets convey electricity from or to shore at or above 132,000 volts (132kV).

In particular it highlights, in example diagrams, the requirement to provide Settlement Metering Equipment to:

- measure and record the flows of electricity to a wind farm generator's assets at low voltages (e.g. 240/415 volts), at the onshore and Offshore substations; and
- measure and record the flows of electricity at the point(s) onshore where the Offshore transmission assets for these Offshore wind farms connect to a Distribution System.

The guidance is primarily aimed at designers and developers of these Offshore wind farms and the companies (BSC Parties) that are ultimately responsible for registering the Metering Equipment (i.e. Registrants) installed at these Offshore wind farms to measure and record these flows of electricity. The guidance will also be useful to designers of Metering Systems, which may include Meter Operator Agents.

BSC requirements

Which flows of electricity need to be measured for Settlement purposes?

[Section L](#)² of the BSC requires the quantities of electricity (i.e. Active Energy, and where relevant, Reactive Energy) Exported³ or Imported at a Boundary Point to the Total System, or flowing between Systems at Systems Connection Points, to be measured (and recorded) by Metering Equipment. The Metering Equipment must:

- comply with the relevant metering [Code of Practice](#) (CoP) for the circuit capacity/demand;
- be commissioned in accordance with [CoP4](#)⁴; and
- for Metering Equipment that is to be registered in the Central Meter Registration Service (CMRS) as a Central Volume Allocation (CVA) Metering System, undergo a proving test in accordance with [BSC Procedure 02](#) (BSCP02)⁵

¹ In 2007, Ofgem and the Department of Energy and Climate Change (DECC); now the Department for [Business, Energy and Industrial Strategy \(BEIS\)](#), proposed new arrangements aimed at encouraging Offshore generation. These arrangements were incorporated into the BSC at 'Go Active' (24 June 2009), and the regime fully commenced on 10 June 2014. Under the arrangements, developers of Offshore wind farms, that connect to the Transmission System (or a Distribution System) onshore at 132kV or above, need to transfer the Offshore transmission assets to an Offshore Transmission Owner (OFTO), via a competitive tender process. When the assets are transferred to the OFTO Ofgem will grant a Transmission Licence to the OFTO to operate those Offshore transmission assets.

² 'Metering'

³ Except in the case of exports related to Exemptable Generating Plant where no Party has accepted responsibility for the exports. A Party can accept responsibility for an Export, if it chooses to, by registering an Export Metering System.

⁴ 'Code of Practice for the Calibration, Testing and Commissioning requirements for Settlement purposes'

What is a Boundary Point?

A Boundary Point (BP) is defined in [Section X, Annex X-1](#) as a point at which any Plant or Apparatus⁶, that does not form part of the Total System, is connected to the Total System. The Total System is comprised of the following Systems:

- the Transmission System;
- each Offshore Transmission System User Assets (OTSUA)⁷; and
- each Distribution System.

For its definition of Transmission System the BSC refers to the meaning of the term 'National Electricity Transmission System' (NETS) in the Transmission Licence. The meaning of the term NETS includes OTSUA and Offshore Transmission Systems (OTS).

When OTSUA are transferred to an Offshore Transmission Owner (OFTO), and its Transmission Licence becomes effective, the OTSUA become an OTS. The BSC considers both OTSUA and OTS part of the Transmission System and, therefore, the Total System.

This means that where any generator's assets in the onshore or Offshore substation connect to OTSUA (or OTS, once operated by an OFTO) these points of connection will be Boundary Points to the Total System. The flows of electricity to or from them need to be measured and recorded by Metering Equipment for Settlement purposes.

What is a Systems Connection Point?

A Systems Connection Point (SCP) is defined in [Section X, Annex X-1](#), as a point of connection (whether consisting of one or more circuits) between two or more Systems. The definition also clarifies that the point of connection of OTSUA to the Transmission System is not a Systems Connection Point.

Since the introduction of term OTSUA into the BSC any Offshore transmission assets for these Offshore wind farms that connect onshore to a Distribution System, are considered part of the Transmission System. This means that the point(s) of connection onshore constitutes a SCP called an Offshore Transmission Connection Point (OTCP), a form of Grid Supply Point. The flows of electricity between the OTSUA (or OTS, once operated by an OFTO) and a Distribution System need to be measured and recorded by Metering Equipment for Settlement purposes.

Who is responsible for an Import/Export at a Boundary Point?

[Section K](#)⁸ defines what an Import and an Export at a Boundary Point are and which BSC Party (Party) is responsible for separately measuring those flows. In the case of an Import to and an Export from a Generating Plant, where electricity is generated by a Party who holds a Generation Licence, then that Party is responsible for those flows.

The Party responsible must register the Metering Equipment as a Metering System in the relevant registration system (i.e. CMRS or a Licenced Distribution System Operator's (LDSO) Supplier Meter Registration Service). Metering Equipment measuring Imports/Exports related to any Licensable Generating Plant and sites connected directly to the Transmission System must³ be registered in the CMRS as a CVA Metering System(s).

⁵ 'Proving Test Requirements for Central Volume Allocation Metering Systems'

⁶ [Section X, Annex X-1](#) defines Plant as fixed or movable items used in the generation, supply, distribution and/or transmission of electricity, other than Apparatus. Apparatus is defined as all equipment in which electrical conductors are used or supported or of which they form part.

⁷ The term OTSUA was introduced into the BSC by [Modification Proposal P294](#). P294 was implemented on 30 December 2013.

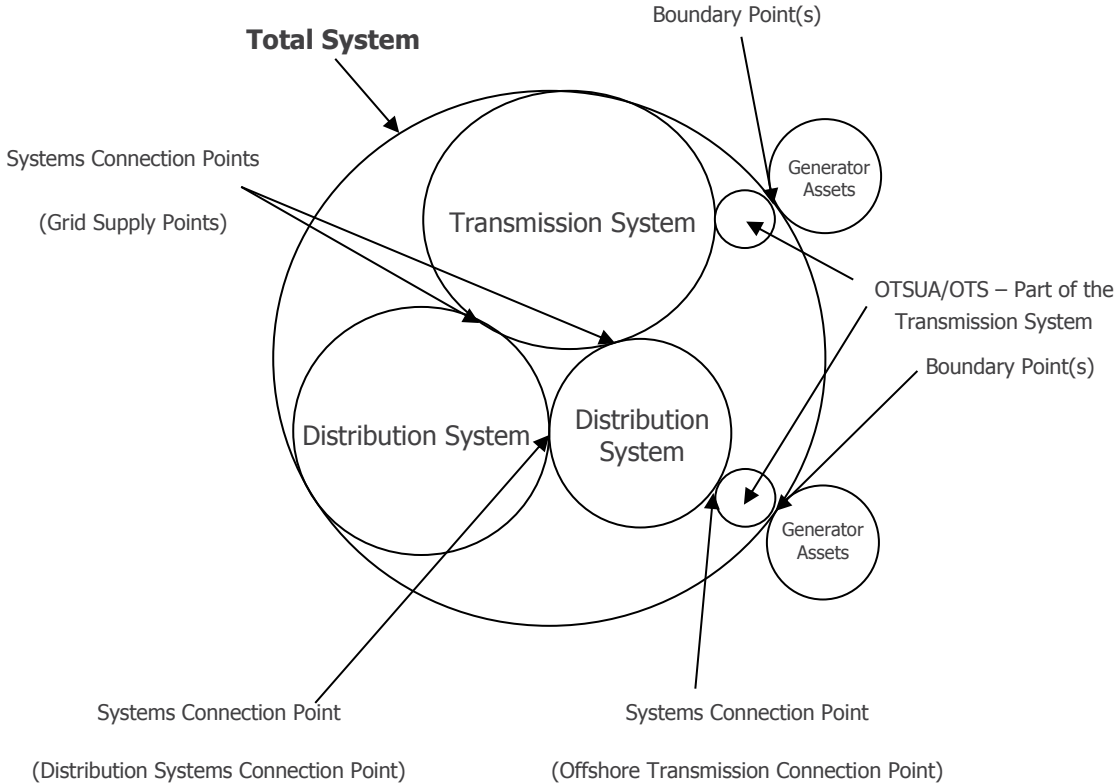
⁸ 'Classification and Registration of Metering Systems and BM Units'

Who is responsible for flows of electricity at an Offshore Transmission Connection Point?

[Section K](#) also defines who is responsible for Systems Connection Points and for measuring the flows of electricity between Systems. The Party responsible for flows of electricity at an OTCP is the National Electricity Transmission System Operator (NETSO).

The NETSO must ensure Metering Equipment is installed to separately measure these flows of electricity (imports and exports) and register the Metering Equipment as a Metering System in CMRS as a CVA Metering System(s).

Diagram representing the Total System (pre and post OFTO):



Where exactly are measurements required to be made for Settlements purposes?

Appendix A of each Half Hourly CoP (i.e. CoPs 1, 2, 3 and 5) sets out the points at which measurements of Imports and Exports at Boundary Points and flows of electricity between Systems at Systems Connection Points need to be made. These are called the Defined Metering Points.

Under Modification Proposal [P238](#)⁹ the Party responsible for Boundary Point Metering Equipment for Offshore Power Park Modules (PPMs) can install the Offshore Boundary Point Metering Equipment either at the point(s) of connection to the Transmission System on the Offshore platform or at a deemed Boundary Point(s) on the Offshore platform. Where the Offshore Boundary Point Metering Equipment for the Offshore PPM(s) is installed at a deemed Boundary Point(s) on the Offshore platform [BSC Section K](#) (1.1.6) and the CoPs require accuracy compensation for any electrical losses

⁹ 'Removal of the requirement to Meter each Boundary Point for Offshore Power Park Modules'

to the point of connection to be considered and, where necessary, applied to the Meter(s) or via the Data Collector's¹⁰ system.

For an Offshore Boundary Point to the Transmission System for low voltage supplies to the wind farm operators assets the Metering Equipment must be installed at the point of connection.

For an onshore Boundary Point to the Transmission System or a Distribution System (e.g. for low voltage supplies to the wind farm operators assets) the Metering Equipment must be installed at the point of connection.

For an OTCP the Metering Equipment must be installed at the point of connection between the Transmission System and the Distribution System.

The example diagrams provided, on the following pages, illustrate where Settlement metering is/may be required pre and post OFTO transfer for these Offshore wind farm that connect to the Transmission System or a Distribution System.

Additional information on Primary BM Units and Trading Units

The BSC requires the Party who is responsible for the Imports and/or Exports to or from Plant and Apparatus to assign that Plant and Apparatus to a Primary Balancing Mechanism Unit (BM Unit). This includes all flows to a wind farm generator's assets at low voltages (e.g. 240/415 volts), at the onshore and Offshore substations.

[BSC Section K3.1](#) sets out the requirements for the configuration of Primary BM Units and includes a number of standard Primary BM Units, including:

- a Power Park Module (PPM) (defined in the Grid Code);
- a Combined Offshore BM Unit (two or more Offshore Power Park Modules as defined in the BSC);
- the Plant and Apparatus which comprises part of, and which Imports electricity through the station transformer(s) of a Generating Plant where the Metering System(s) for such Imports is or are registered in CMRS; and
- the premises (of a Customer supplied by a Party) which are directly connected to the Transmission System, provided that such premises are so connected at one Boundary Point only.

If there is any Plant and Apparatus that does not fall into a standard Primary BM Unit category then the responsible Party can apply for a non-standard Primary BM Unit. Parties can also apply for non-standard Primary BM Units where the Plant and Apparatus does meet standard categories but the relevant Party considers that a different configuration would still meet the requirements of the BSC.

Applications for non-standard Primary BM Unit configurations require BSC Panel approval in accordance with [Section K3](#) and [BSCP15](#)¹¹ following consultation with the NETSO. The BSC Panel has delegated approval of non-standard Primary BM Unit configurations (and Trading Unit Applications) to the [Imbalance Settlement Group](#) (ISG). Applications for non-standard Primary BM Unit configurations need to be submitted to ELEXON (bm.unit@elexon.co.uk) at least 60 WD prior to the Primary BM Unit Effective From Date (EFD).

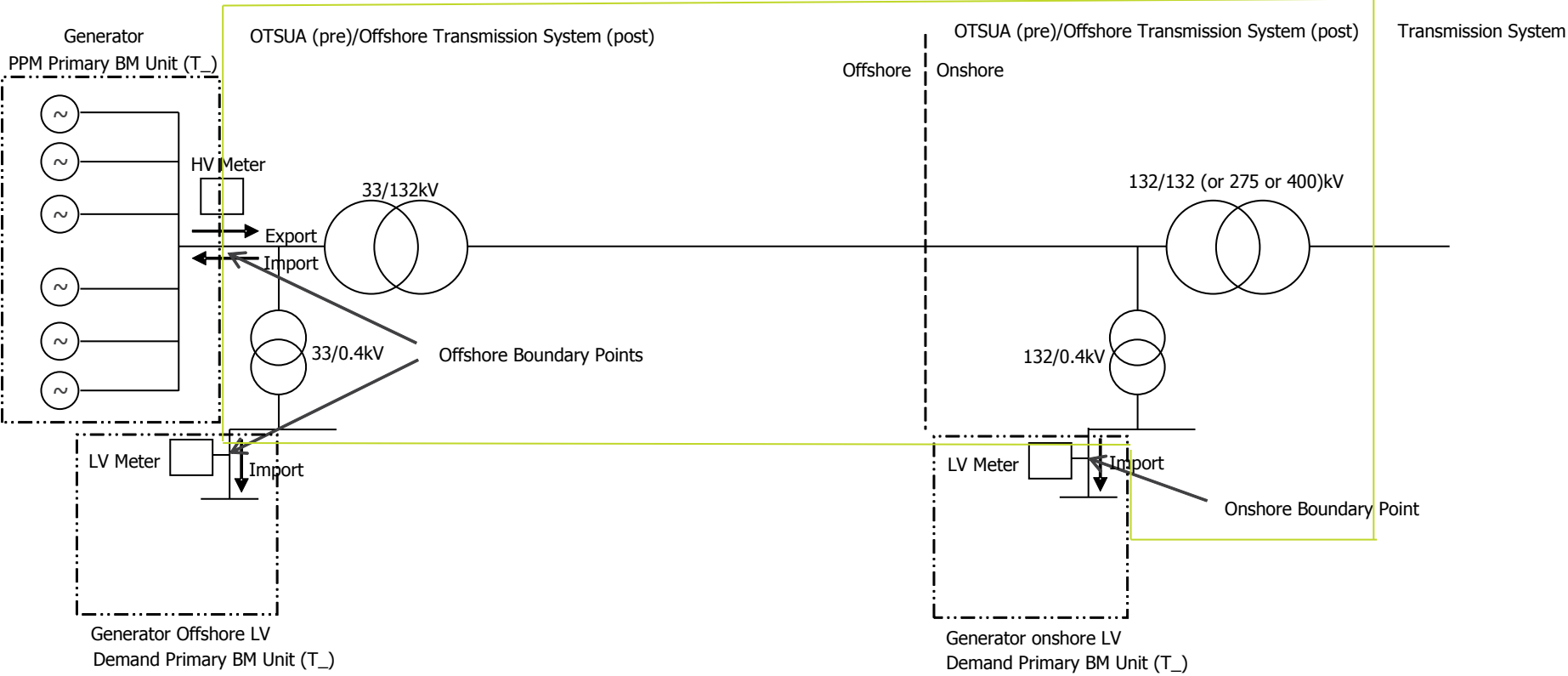
¹⁰ The Central Data Collection Agent (CDCA) is the BSC Party Agent responsible for collecting metered data from Metering Systems registered via the Central Registration Agent (CRA) in CMRS as a CVA Metering System. Accuracy compensation can be applied via the Aggregation Rule for a Primary Balancing Mechanism Unit.

¹¹ 'BM Unit Registration'

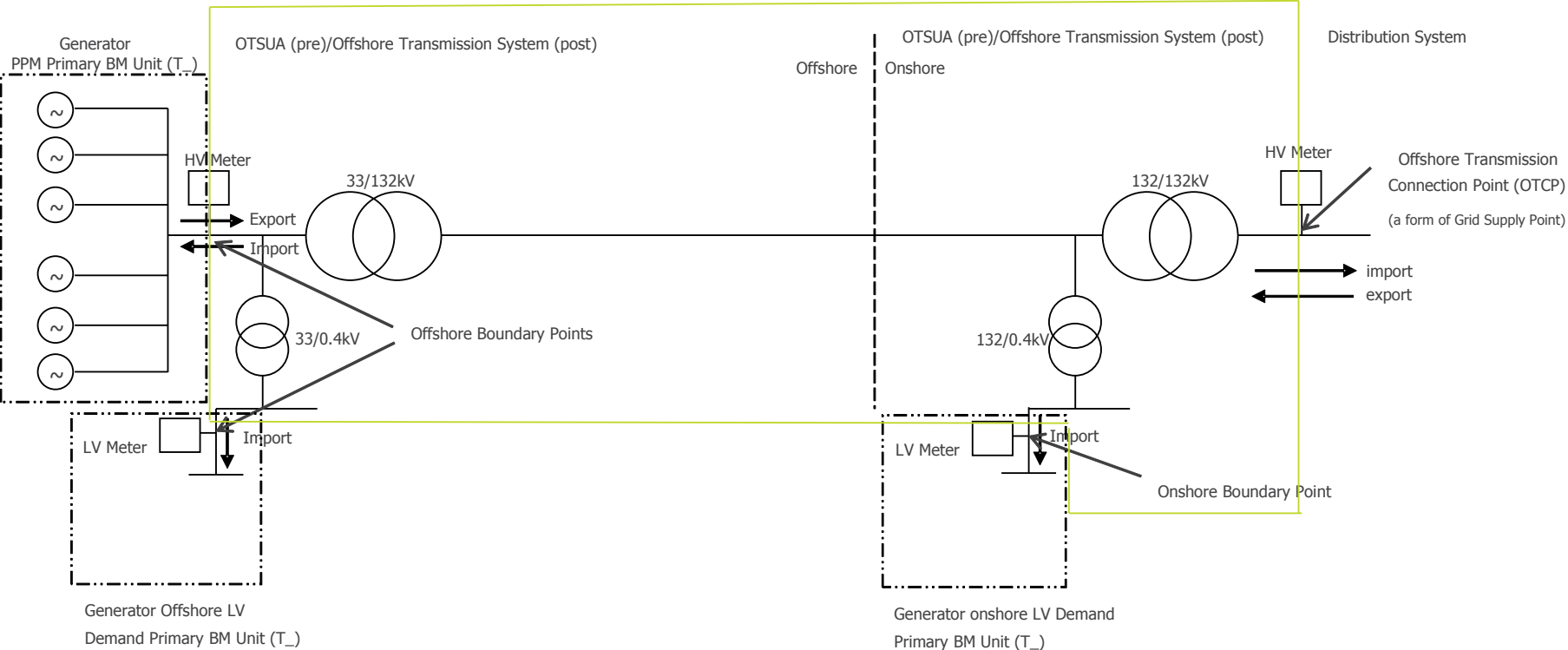
A Primary BM Unit is by default a Trading Unit however a Party can apply to the ISG, in accordance with [Section K4](#), [Section K \(Annex K-2\)](#) and [BSCP31](#)¹², to have a combination of Primary BM Units in a Trading Unit. Applications for Trading Units need to be submitted to ELEXON (trading.unit@elexon.co.uk) at least 30 WD prior to the next available ISG meeting and can be made in advance of the registration of the relevant Primary BM Units.

¹² 'Registration of Trading Units'

Transmission System Connected Offshore Wind Farm



Distribution System Connected Offshore Wind Farm



Need more information?

For more information please contact the **BSC Service Desk** at bscservicedesk@cgi.com or call **0370 010 6950**.

Intellectual Property Rights, Copyright and Disclaimer

The copyright and other intellectual property rights in this document are vested in ELEXON or appear with the consent of the copyright owner. These materials are made available for you for the purposes of your participation in the electricity industry. If you have an interest in the electricity industry, you may view, download, copy, distribute, modify, transmit, publish, sell or create derivative works (in whatever format) from this document or in other cases use for personal academic or other non-commercial purposes. All copyright and other proprietary notices contained in the document must be retained on any copy you make.

All other rights of the copyright owner not expressly dealt with above are reserved.

No representation, warranty or guarantee is made that the information in this document is accurate or complete. While care is taken in the collection and provision of this information, ELEXON Limited shall not be liable for any errors, omissions, misstatements or mistakes in any information or damages resulting from the use of this information or action taken in reliance on it.