

4.3 CP Form

<p align="center">Change Proposal – BSCP40/02</p>	<p>CP No:</p> <p><i>Version No:</i> (mandatory by BSCCo)</p>
<p>Title (mandatory by originator)</p> <p>Permitting the use of busbar voltage transformers within metering Codes of Practice 1 and 2</p>	
<p>Description of Problem/Issue (mandatory by originator)</p> <p>Section L of the Balancing and Settlement Code (BSC) requires flows of electricity to be measured and recorded by Metering Equipment for Settlement purposes. The Metering Equipment must comply with the relevant Code of Practice (CoP) for the circuit capacity/demand.</p> <p>The size and weight of voltage transformers (VTs) used at Offshore wind farm power transformer platforms, which are subject to Offshore Transmission Owner (OFTO) arrangements (at or above 132kV Offshore transmission voltage), can significantly affect the cost and complexity of development. This is because additional space on an Offshore platform is required to accommodate the VTs within the Gas Insulated Switchgear (GIS). This results in the need for larger Offshore platforms, leading to an increase in cost.</p> <p>Under the existing BSC requirements, there are two approaches that are used for metering Offshore wind turbine string arrays¹:</p> <ol style="list-style-type: none"> 1. Code of Practice (CoP) 1 ‘The metering of circuits with a rated capacity exceeding 100 MVA for Settlement purposes’ is applied where the entire project goes live at the same time and has the same owner. CoP1 Metering Systems are typically used to meter volumes at the 33kV or 66kV connection to the platform transformers. 2. CoP 2 ‘The metering of circuits with a rated capacity not exceeding 100 MVA for Settlement purposes’ is applied where: <ol style="list-style-type: none"> a) turbine arrays are Commissioned at different stages of a wind farm project; or b) different arrays have different owners. <p>CoP2 Metering Systems are installed to meter volumes at the strings for each individual array.</p> <p>For Metering Systems installed at the string level (following CoP2), the current requirement is to have a separate VT per circuit. This contributes to the cost and complexity of development. Current transformers and main and check Meters are still required per circuit.</p> <p>Siemens Transmission and Distribution Limited (STDL) raised Issue 87 on 3 March 2020 as they believe that there are effective alternatives to this metering set up. The Issue 87 Report was presented to the BSC Panel at its meeting on 10 June 2021. The Issue group agreed a solution that reduces the need for multiple VTs at the string level on Offshore wind farm power</p>	

¹ A set of wind turbines sharing a common circuit connected in parallel is known as a 'string'.

transformer platforms by allowing the placement of VTs at the busbar. To recognise this configuration under the BSC, a change to CoP2 is necessary to allow busbar VTs to be used.

STDL recently confirmed that as Wind Turbine Generators (WTGs) get larger in capacity, and busbar voltages increase to 132kV, array feeders will begin to need CoP1 metering so the solution should be made applicable to CoP1 as well as CoP2.

Proposed Solution (mandatory by originator)

The Issue 87 group initially considered two potential solutions for metering at string level to CoP2 standards:

- Option 1: Two busbar VTs are used, each with a single secondary winding. The main Meters are connected to the 'main' VT's secondary winding and the check Meters are connected to the 'check' VT's secondary winding. This option offers redundancy if the main VT fails as the check VT continues to feed the check Meters.
- Option 2: Two busbar VTs are used, each with several secondary windings. The main and check Meters for each string are connected to their own dedicated secondary winding. This approach mirrors current requirements in CoP2 more closely than Option 1. However, there is no redundancy. If one VT fails, both the main and check Meters fed by that VT fail.

For the reasons given above, the Issue 87 group unanimously prefer **option 1** as the proposed solution.

The proposed solution is not intended to exclude current requirements under the status quo. The desired outcome is that the change provides optionality within CoP2 for additional configurations (i.e. placement of VTs at the busbar) that parties are free to choose, should they wish to.

Having considered the benefits to this approach, the Issue 87 group believe it would be appropriate for the solution to apply onshore sites (generally), as well as Offshore wind farms.

To recognise the configuration proposed by the Issue 87 group under the BSC, a change to CoP2 is necessary to allow busbar VTs to be used.

As a result of recent discussions with STDL, Elexon recommends the proposed solution should also be future proofed to cover CoP1 metering at string level, to take into account the increasing size of WTGs.

The proposed redlined changes are attached.

Justification for Change (mandatory by originator)

Wind is recognised as being an important source of renewable energy, but significant size and weight requirements can make developing new wind farms complex and costly. This ultimately has a negative effect on end customers who have to fund this through their energy bills.

If a solution to reduce the requirement of VTs in Metering Systems can be delivered, then new projects can be secured with lower investment costs. Savings could be expected to scale with the capacity of the site - therefore a 1 GW site could expect savings of around £1 million, with a 1.5 GW site expecting savings of around £1.5 million. This will ultimately support competition by making new projects more available, which will benefit the end consumer.

Additional benefits

The Issue 87 group also identified the following benefits:

- The solution offers increased redundancy than the status quo and enables a higher availability of metered data for wind farms. This is because the main Meters are connected to one VT and the check Meters are connected to a separate VT. The failure of a VT would not impact on the Metering System which allows for a greater quality of data entering Settlement in these instances.
- There is an environmental benefit in that any reduction in VTs will lead to a reduction in the greenhouse gas Sulphur Hexafluoride (SF6) which is used to make VTs and would ultimately end up in the atmosphere via leakage.
- A solution that decreases the likelihood of engineers needing to perform maintenance on a hard-to-reach site may offer operational safety benefits.

To which section of the Code does the CP relate, and does the CP facilitate the current provisions of the Code? (mandatory by originator)

[BSC Section L 'Metering'](#)

Estimated Implementation Costs (mandatory by BSCCo)

Under £1000 to make the required document changes. No changes to systems for market participants or Elexon are required.

BSC Configurable Items Affected by Proposed Solution(s) (mandatory by originator)

Codes of Practice 1 and 2

Impact on Core Industry Documents or System Operator-Transmission Owner Code (mandatory by originator)

N/A

Related Changes and/or BSC Releases (mandatory by BSCCo)

[Issue 87 'Busbar voltage transformer metering for Offshore wind farms under OFTO arrangements'](#)

Requested Implementation Date (mandatory by originator)

03 November 2023

Reason: BSC Standard release
Version History (mandatory by BSCTCo)
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<i>Date:</i> 7 March 2023
Attachments: Y Attachment 1: CoP1 proposed redlining Attachment 2: CoP2 proposed redlining