

Metering Dispensation D/534 – Seagreen Offshore Wind Farm LVDC supplies (site specific or generic)

Imbalance Settlement Group (ISG)

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Summary

The current Settlement metering Codes of Practice (CoPs) only cover Metering Equipment designed for Alternating Current (AC) circuits. Seagreen Wind Energy Limited (SWEL) has applied for a site specific Metering Dispensation (D/534) from CoPs 5 and 4, for a solution to the issue of metering its Low Voltage Direct Current supplies on its Seagreen Offshore Wind Farm. D/534 proposes a similar solution to that proposed and approved under Metering Dispensations D/461 and D/474 but, it uses a communicating version of the same Meter type and allows the Meter to pulse into any CoP5 compliance tested and protocol approved Outstation, dialled by the Central Data Collection Agent, as opposed to a specific one (the Elster A1700). SWEL would be happy for the application to be made generic, as long as this does not introduce any delay. We invite the ISG to approve D/534, against CoP4 only, as a generic Metering Dispensation for its solution and also to amend D/534 to capture the solutions already covered by D/461 and D/474, and then end-date registrations against them. Since CoP4 is shared with the Supplier Volume Allocation Group (SVG), we will also be taking a similar decision paper to the SVG, with a similar recommendation, in respect of CoPs 5 and 4.

1. BSC requirements

- 1.1 Section L¹ of the Balancing and Settlement Code (BSC) requires all Metering Equipment to either:
 - comply with the requirements set out in the relevant Code of Practice (CoP) at the time the Metering System is first registered for Settlement under the BSC (L3.2.2); or
 - be the subject of, and comply with, a Metering Dispensation (L3.4).
- 1.2 Section L allows the Registrant of a Metering System to apply for a Metering Dispensation if, for financial or practical reasons, Metering Equipment will not or does not comply with some or all the requirements of a CoP.
- 1.3 Section L also allows the Panel, or any BSC Party, to raise a generic Metering Dispensation. In this case the Panel needs to consult with all BSC Parties.
- 1.4 The process for applying for a Metering Dispensation is set out in [BSCP32](#)².

¹ 'Metering'

² 'Metering Dispensations'

2. Background to Metering Dispensation D/534

- 2.1 The current suite of ten Settlement metering CoPs (CoPs 1 -10) only cover Metering Equipment³ designed for Alternating Current (AC) circuits. Therefore, no Direct Current (DC) Meters have been compliance-tested under [BSCP601](#)⁴ against any Half Hourly CoP requirements. In addition, no DC Meters have been approved under the [Electricity Act 1989](#), which would apply if a DC Meter was to be used for customer billing purposes.
- 2.2 **D/461** – In December 2015 DONG Energy Burbo Extension (UK) Limited applied for a generic Metering Dispensation (D/461) from the relevant clauses of [CoP5](#)⁵ for a metering solution for the measurement of small Imports for DC circuits located on Offshore wind farm platforms (Attachment E). The application also noted that [CoP4](#)⁶ could not be complied with either as it only references AC standards.
- 2.2.1 D/461 covers the use of a specific Hall Effect⁷ current transducer (Powertek CTH/**100A**/4-20/TH/9-36V dc type 2), or a shunt⁸, and a DC Meter type (ACCUENERGY AcuDC243-300V-A2-P1-X4-NC-ND) which provides pulses to a compliance tested and protocol approved Outstation (Elster A1700). See Attachment B for details of the DC Meter type⁹.
- 2.2.2 At its meeting in February 2016, the Supplier Volume Allocation Group (SVG) (180/02) approved D/461, on a lifetime basis, subject to the condition that the DC metering solution is not used for measuring DC supplies to customers for billing purposes. It is not clear why Elexon did not also take a paper to the ISG in respect of a Metering Dispensation from CoP4.
- 2.3 **D/474** – In March 2017 DONG Energy Burbo Extension (UK) Limited applied for a generic Metering Dispensation (D/474) to supplement Metering Dispensation D/461 and cover additional ratios of specific Hall Effect current transducers (Attachment F):
- Powertek CTH/**20A**/4- 20/TH/9-36Vdc type 2;
 - Powertek CTH/**50A**/4-20/TH/9-36Vdc type 2; and
 - Powertek CTH/**200A**/4-20/TH/9-36Vdc type 2.
- 2.3.1 At its meeting in May 2017, the SVG (195/02) approved D/474, on a lifetime basis, subject to the condition that the DC metering solution is not used for measuring DC supplies to customers for billing purposes. It is not clear why Elexon did not also take a paper to the ISG in respect of a Metering Dispensation from CoP4.
- 2.3.2 D/461 and D/474 are listed on the [Statement of Generic Metering Dispensations](#).

3. Metering Dispensation D/534

- 3.1 Seagreen Wind Energy Limited (SWEL) has applied for a lifetime, site specific, Metering Dispensation (D/534) from CoPs 5 and 4 (Attachment A). This is for a solution to the issue of metering its Low Voltage DC supplies on its Seagreen Offshore Wind Farm.
- 3.2 D/534 proposes a similar solution to that within approved generic Metering Dispensations D/461 and D/474 but, it uses a communicating version of the same Meter type (ACCUENERGY AcuDC 243-300V-A2-P1-X4-**C**-ND) and allows the DC Meter to pulse into any CoP5 compliance tested and protocol approved Outstation, dialled by the Central Data Collection Agent, as opposed to a specific one (the Elster A1700). SWEL has provided the manufacturer's DC Meter brochure (Attachment B).
- 3.3 SWEL would be happy for application to be made generic, as long as this does not introduce any delay.
- 3.4 We contacted the applicant for D/461 and D/474 and asked if it had any concerns about amending D/534 to include the solutions provided by D/461 and D/474 and end dating (registrations against) them. The applicant confirmed that, in principle, they were happy for the solutions in D/461 and D/474 to be included in D/534 and D/461 and D/474 end-dated, as long as this does not affect their current installations. We suggested we could

³ Section X Annex X-1 defines Metering Equipment as 'Meters, measurement transformers (voltage, current or combination units), metering protection equipment including alarms, circuitry, associated Communications Equipment and Outstations and wiring'

⁴ 'Metering Protocol Approval and Compliance Testing'

⁵ 'Code of Practice for the metering of energy transfers with a maximum demand of up to (and including) 1MW for Settlement purposes'

⁶ 'Code of Practice for the calibration, testing and commissioning requirements of Metering Equipment for Settlement purposes'

⁷ A Hall Effect transducer uses the magnetic field created in a current carrying wire, or cable, to generate a proportional signal to feed a measuring device, like a DC Meter.

⁸ A shunt is a high accuracy (or 'precision') resistor. When a shunt is connected in series with the primary circuit, all the primary current goes through it, and the voltage dropped across it is fed to a measuring device, like a DC Meter. Since Voltage (V) = Current (I) x Resistance (R) (Ohms Law) then the voltage drop across the shunt is directly proportional to the current flowing through it (assuming the Resistance values remains constant).

⁹ This was provided by the applicant of D/534 as the applicant for D/461 and D/474 preferred to keep this information (and other details of the proposed solution) confidential at that time, for competitive reasons, although it was/is publically available.

end-date registrations against them so that they were still applicable to DC Metering Systems already registered but that, going forward, D/534 (if approved to cover D/461 and D/474) would need to be used.

- 3.5 The amended solution should also include Meter variants that use shunts as this was missed under the DC Meter type mentioned in the Metering Dispensation applications for D/461 and D/474.
- 3.6 The amended solution under D/534 would look like this:
- 3.6.1 “Direct Current (DC) metering solution for Offshore wind farm DC supplies. This generic lifetime Metering Dispensation provides a metering solution for measuring small DC supplies to wind farm generator assets at Offshore substations (or onshore substations) for Offshore wind farms as the BSC doesn’t make provisions for DC metering. The Metering Dispensation is against all the relevant clauses in CoP5 and CoP4 as CoP5 and CoP4 are specific to the metering of energy transfers on AC circuits. D/534 covers the use of:
- Powertek Hall Effect transducers (accuracy within $\pm 0.5\%$):
 - Powertek CTH/**20A**/4- 20/TH/9-36Vdc type 2;
 - Powertek CTH/**50A**/4-20/TH/9-36Vdc type 2;
 - Powertek CTH/**100A**/4-20/TH/9-36Vdc type 2; or
 - Powertek CTH/**200A**/4-20/TH/9-36Vdc type 2; or
 - Any suitable shunts (accuracy within $\pm 0.5\%$); and
 - ACCUENERGY DC Meter types (accuracy within $\pm 0.5\%$):
 - AcuDC243-300V-A1-P1-X4-NC-ND (non-communicating meter type (NC) for use with a shunt (A1))
 - AcuDC243-300V-A1-P1-X4-C-ND (communicating meter type (C) for use with a shunt (A1))
 - AcuDC243-300V-A2-P1-X4-NC-ND (non-communicating meter type (NC) for use with a Hall Effect transducer (A2))
 - AcuDC243-300V-A2-P1-X4-C-ND (communicating meter type (C) for use with a Hall Effect transducer (A2)); and
 - Outstation (receiving pulses from any of the above DC Meter types):
 - Any CoP5 compliance tested and protocol approved Outstation dialled by the Central Data Collection Agent (CDCA) for use in Settlement.
 - Calibration and Commissioning
 - All Metering Equipment shall be calibrated (initially and periodically), and commissioned, in accordance with the principles set out in CoP4 to confirm the stated accuracy limits for each item of the Metering System are met over the stated range of measurement outputs (transducers or shunts) and inputs (DC Meter) and the Outstation correctly records the amount (and direction) of energy flows in the primary system conductor(s).
- 3.6.2 Please contact the metering team via the BSC Service Desk for additional information on this Metering Dispensation.
- 3.6.3 A condition of the Metering Dispensation is that the DC metering solution is not used for measuring DC supplies to customers for billing purposes”.

4. MDRG comments

- 4.1 We circulated the Metering Dispensation application and its attachment to the Metering Dispensation Review Group (MDRG) for comments (Attachments A - B).
- 4.2 One out of three MDRG Members responded. One MDRG Member supports the application as a site specific Metering Dispensation only. This MDRG Member suggests it should be added into the metering CoPs rather than being a generic Metering Dispensation. Including it in the CoPs will allow for IEC/BS standards to be stated and greater guidance around what is and isn’t acceptable to be provided.

5. NETSO comments

- 5.1 We circulated the Metering Dispensation application and its attachment to the National Electricity Transmission System Operator (NETSO) for comments (Attachments A - B).

- 5.2 The NETSO confirmed it has no concerns with the application (or on the application being generic). It did have a general question. 'If the CoPs don't cover DC metering, is this something that we may want to consider updating (via Issue 93?) given the expected growth in offshore developments in the next few years?'
- 5.3 We noted that Issue 93 is dealing with many aspects of the CoPs and there was a danger of scope creep if new aspects are added. We pointed out that a BSC Party could raise a Change Proposal or even an Issue to discuss which standards the DC meters and transducers should meet and that a recommendation could then be made to update the consolidated CoP proposed under Issue 93. We noted that the International Electrotechnical Committee (IEC) has released a new standard this year for class 0.5 and class 1.0 DC meters (IEC 62053-41¹⁰). We have subsequently determined that this only covers directly connected (whole current) meters and references IEC/BS EN 62052-11¹¹ for nominal voltage and current which, for a DC meter, go up to 1500V and 500A. The IEC is also currently working on a draft DC Meter standard (50470-4) which uses different class indices (i.e. classes A, B and C), as used under the Measuring Instruments Directive (MID) and the UK implementation of the recast version of it, the Measuring Instruments Regulations 2016 ([SI 2016 No. 1153](#)).

6. Supplier Volume Allocation Group

- 6.1 According to the [BSC Baseline Statement](#) the SVG are solely responsible for CoP5 and jointly responsible, with the ISG, for CoP4.
- 6.2 Although D/461 and D/474 clearly reference that the CoPs do not cover DC standards, including CoP4, the applications did not expressly mention CoP4, in the relevant section of the application form¹², and it appears we did not consult with the ISG regarding departures from CoP4.
- 6.3 D/534 clearly states that a Metering Dispensation is required from CoP4. Therefore, we will be taking a similar decision paper to the SVG for non-compliance with CoPs 4 and 5.

7. Generic Metering Dispensation consultation responses

- 7.1 Before considering a generic Metering Dispensation (L3.4.4) the Panel needs to consult with all Parties (L3.4.5), and with such other persons if any as the Panel shall consider appropriate. The MDRG is considered an Appropriate party under BSCP32.
- 7.2 In December 2021, on behalf of the Panel, we consulted with all BSC Parties via a generic [Metering Dispensation consultation for D/534](#).
- 7.3 We asked to the following two consultation questions:
- Q1. Do you agree that D/534 should or could be a generic Metering Dispensation rather than a Site Specific Metering Dispensation?
 - Q2. Do you agree that D/534 should or could be amended (if the applicant agrees to it) to capture the solutions already covered by D/461 and D/474, and then end-date them (with their applicants' agreement)?
- 7.4 We received no responses to the consultation questions.

8. Elexon's view

- 8.1 Elexon supports this site specific application as accuracy will be maintained within CoP5 limits at the DMP using the Hall Effect current transducer, DC Meter and a compliance and protocol approved Outstation dialled by the CDCA.
- 8.2 Elexon also supports this application being a generic Metering Dispensation as the SVG has approved other similar solutions as generics for any BSC Party to use (D/461 and D/474).
- 8.3 In terms of simplicity, we recommend that the SVG (and the ISG) approve D/534 as a generic Metering Dispensation and also amend it to capture the solutions already covered by D/461 and D/474, and then end-date registrations against them. This will provide a single source for a DC metering solution going forward. If the CoPs are modified in future to specify DC standards then D/534 could also be end-dated in a similar way to D/461 and D/474 for future registrations.

¹⁰ 'Electricity metering equipment - Particular requirements - Part 41: Static meters for DC energy (classes 0,5 and 1)'

¹¹ 'Electricity metering equipment - General requirements, tests and test conditions - Part 11: Metering equipment'

¹² Part D - Technical Details, Code of Practice details.

9. Recommendations

9.1 We invite the ISG to:

- a) **APPROVE** Metering Dispensation D/534 against Code of Practice 4, on a lifetime basis, as a generic Metering Dispensation and also to amend D/534 to capture the solutions already covered by D/461 and D/474, and then end-date registrations against them; and
- b) **NOTE** we will present a similar paper to the Supplier Volume Allocation Group, with a similar recommendation, in respect of CoPs 4 and 5.

Attachments

Attachment A – Metering Dispensation application D/534

Attachment B – Manufacturer brochure - DC Meter

Attachment C – SVG180/02 – D/461 SVG paper

Attachment D – SVG295/02 - D/474 SVG paper

Attachment E – Metering Dispensation application D/461

Attachment F – Metering Dispensation application D/474

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