

ISG214/02 – METERING DISPENSATION D/493 – SPALDING ENERGY EXPANSION (OCGT)

MEETING NAME	ISG 214
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Date of meeting	19 February 2019
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Paper number	214/02
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Owner/author	Mike Smith
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Purpose of paper	Decision
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Classification	Public
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Summary	Spalding Energy Expansion Limited has applied for a lifetime Metering Dispensation (D/493) against Code of Practice 1 for the Metering Equipment associated with its new 300MW Open Cycle Gas Turbine Generating Plant. The Metering Equipment is fully compliant with CoP1 apart from its location, which is approximately 120m away from the Defined Metering Point - the point of connection to the Transmission System. We invite the ISG to approve Metering Dispensation D/493 on a lifetime basis.
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1. BSC requirements

- 1.1 Section L 'Metering' 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; or
 - be the subject of, and comply with, a Metering Dispensation.
- 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 The process for applying for a Metering Dispensation is set out in BSCP32 'Metering Dispositions'.

2. Confidentiality request

- 2.1 Registrants can request confidentiality for Metering Dispensation applications (or parts of them or attachments to them). In this case, the Registrant has requested confidentiality for the electrical single line diagrams (Attachments B - F).

3. Background to Metering Dispensation D/493

- 3.1 The Spalding Energy Expansion (SEE) Generating Plant comprises a new 300MW Open Cycle Gas Turbine (OCGT) Generating Unit. The OCGT Generating Unit, and the associated unit transformer and auxiliaries, are connected directly to the Transmission System at National Grid's (NG's) Spalding North 400kV substation, via a single 400kV circuit (i.e. 3 'phase' cables). The Metering Equipment measuring the Imports to and Exports from the Generating Plant is located in the nearby Welland Power 400kV substation (Attachments B, C and D).

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4. Metering Dispensation application (D/493)

- 4.1 Spalding Energy Expansion Limited (SEEL) has applied for a lifetime Metering Dispensation (D/493) against CoP1¹ for the Metering Equipment associated with its new 300MW OCGT Generating Plant (Attachment A). The Metering Equipment is fully compliant with CoP1 apart from its location, which is approximately 120m away from the Defined Metering Point (DMP) - the point of connection to the Transmission System.
- 4.2 SEEL states that the metering current transformers (CTs) and voltage transformers (VTs) are located where they are because:
- the 400kV Highly Integrated Switchgear (HIS) is unable to have tariff metering standard CTs or VTs due to the lack of space available within the VT and CT enclosures within the switchgear. It also notes that the switchgear is a gas enclosed design.
 - there aren't (currently) any certified High Accuracy Metering (HAM) CTs or VTs which are suitable for the inclusion within the 400kV HIS switchgear; and
 - there is no space available next to the cable sealing ends from the HIS switchgear (near to label X591C on the attached sketch) (Attachment D).
- 4.3 SEEL estimates that it will cost £460k to relocate the existing Metering Equipment to the DMP. This will involve:
- relocating the emergency standby generator (£70,000);
 - relocating the Portable Relay Room (PPR) (this is where Meters are located) (£35,000);
 - replacing the cable sealing ends on the HIS switchgear with gas to air bushings (£180,000);
 - constructing a plinth for the HAM CTs and VTs (£15,000);
 - installing new cable sealing ends and re-terminating the 400kV cables (£55,000);
 - adding new busbar sections within the 400kV AIS compound (£5,000);
 - installing new multicore cables from the primary plant to the re-located PRR (£25,000);
 - re-commissioning all equipment (£25,000); and
 - NGET time for a Senior Authorised Person and recommissioning (£50,000).
- 4.4 SEEL proposes to compensate the Settlement Meters for CT/VT errors and, following the assessment of the cable losses (Attachment G), does not propose to compensate the Meters for the cable losses (0.0023%). This is on the grounds that they are not material. With or without cable loss compensation the overall accuracy of the Metering System will be maintained within CoP1 limits (e.g. +/-0.5% at Unity Power Factor) at the DMP.

5. MDRG comments

- 5.1 We circulated the Metering Dispensation application to the Metering Dispensation Review Group (MDRG) for comments.
- 5.2 Four out of five MDRG members responded. One MDRG member declined to comment as they are the Meter Operator Agent for the SEE Metering System. Three MDRG members support the application.
- 5.3 Two MDRG members, who supports the application, do so on the following bases:
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¹ 'Code of Practice for the metering of circuits with a rated capacity exceeding 100MVA for Settlement purposes'

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- that they are comfortable that losses of that magnitude are small enough to not compensate for; the inaccuracy of the Meter will be greater; and
- they can't see that this will materially change the error requirements for the CoP.

5.4 The other MDRG member, who supports the application, asked that the following comments be raised with the ISG since the design is not compliant with the BSC in respect of the location of the AMP:

- a Distributor representative recently highlighted that industry governance for competitive provision of equipment has changed and may result in more scenarios where metering is not at the DMP. Is the ISG aware of these changes? Do they require a consequential change to the BSC?;
- the design has clearly existed for some years based on the drawing history. So why was this design approved for installation by network companies when it conflicts with BSC?; and
- if this design was deemed necessary, then why was a Metering Dispensation not sought several years ago²?

6. Transmission Company comments

6.1 We circulated the Metering Dispensation application to the Transmission Company for comments.

6.2 The Transmission Company questioned:

- whether the DMP was actually at the point of connection to the 400kV busbars in the Spalding North 400kV substation rather than the outgoing cable connections from the HIS, as annotated in Attachment C, and what was the 'standard approach';
- whether the switchgear was deemed to have no impact on the energy flows; and
- why there is no explanation as to the reason why that particular switchgear was purchased, because the NG busbars at Spalding North 400kV substation appear to be Air Insulated Switchgear (AIS). In addition, the Transmission Company asked if they could have bought switchgear that could accommodate a compliant CT, what the additional cost would have been and would those costs have been less than £460k?

6.3 SEEL responded:

- that the HIS switchgear will not have any impact on the energy flow (there is only a very small amount of capacitive charging which is ignored when it comes to switchgear) and only the cable will have an impact. This is a standard approach³;
- the HIS switchgear has been used due to space constraints at Spalding and that replicating what exists, e.g. installing AIS switchgear, would mean that they would have breached electrical and safety clearances (therefore a risk to life and equipment). This was investigated during the Front End Engineering Design (FEED) stage for the project. If they had to install AIS switchgear, then the 400kV substation would need to have been extended, along with the main and reserve busbars. This would

² The Registrant confirmed that the lack of an early Metering Dispensation application was an oversight during design work which was undertaken in late 2017 – it was not several years ago.

³ ELEXON notes that it isn't always practicable to install CTs/VTs 'at' the DMP. Installing them within a few metres of the DMP is a practicable option. In this case ELEXON believes the DMP is at the points of connection to National Grid's 400kV main and reserve busbars and would not expect two sets of Metering Equipment but rather one set, for a single circuit, as close as practicable to the point(s) of connection, on the common circuit. The Registrant has confirmed it is not possible to install CTs/VTs in the HIS and that the losses are minimal from the cable entry point to the HIS (the (incorrectly (in our view) annotated DMP in Attachment C) to the points of connection (the actual DMP).

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have added between £3M to £4M onto the overall project costs. Therefore, it was uneconomical to pursue an AIS solution; and

- that the HAM (High Accuracy Metering) units cannot be installed within the HIS switchgear due to a lack of space within the CT and VT containment vessels to accommodate the CTs and VTs for both metering and protection purposes. They also noted that even if space was available, it would be against NGET technical standards to house the HAM CTs and VTs within the same containment as that for the protection. In addition, if the HAM units were to be installed at the point of connection, there is insufficient space to accommodate these without impinging on electrical and safety clearance with adjacent equipment. The applicant noted that the solution for the HAM units is a similar arrangement to that for the existing Spalding Power Station⁴.

6.4 The Transmission Company later confirmed it had no issues or objections to the application.

7. Electrical Loss Validation Agent comments

7.1 As the Registrant has confirmed it does not propose to apply compensation for the cable losses we did not circulate the Metering Dispensation application, cable ('as laid') document (Attachment E) and the cable loss compensation factors (Attachment F) to the Electrical Loss Validation Agent for confirmation that cable loss compensation factors are suitable.

8. ELEXON's view

8.1 ELEXON supports this lifetime Metering Dispensation application as accuracy will be maintained within CoP1 limits at the DMP. The generator's Meters will be compensated for measurement transformer errors and the electrical losses from the AMP to the DMP, across approximately 120 metres of 400kV cable, are minimal.

9. Recommendations

9.1 We invite you to:

- a) **APPROVE** Metering Dispensation D/493, for the Spalding Energy Expansion OCGT, on a lifetime basis.

Attachments

Attachment A – Metering Dispensation (D/493) application form

Attachment B (CONFIDENTIAL) – SEE overall single line diagram (SLD)

Attachment C (CONFIDENTIAL) – SEE CT and VT SLD

Attachment D (CONFIDENTIAL) – SEE sketch of placement of CTs/VTs

Attachment E (CONFIDENTIAL) – Cable ('as laid') document

Attachment F (CONFIDENTIAL) – Cable loss compensation factors

For more information, please contact:

Mike Smith, Metering Analyst

⁴ The Metering Equipment for Spalding Power Station (a Combined Cycle Gas Turbine (CCGT) Generating Plant) was installed at a time (i.e. prior to 2 November 2017 (and [CP1479](#))) when the DMP in the metering Codes or Practice was "at the high voltage side of the generator transformers...", not "at the point(s) of connection of the Generating Plant to the Transmission System", as it is now.

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