

Metering Dispensation D/543 – Heysham 2 Power Station

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Summary **EDF Energy Nuclear Generation has applied for a retrospective, lifetime Metering Dispensation (D/543) from Code of Practice (CoP) 1. This is to use a capacitive voltage transformer (CVT), instead of a wire wound VT, to replace the failed CVT measuring Reactive Energy, for the Generator Transformer 7 circuit, at Heysham 2 Power Station. We invite the ISG to approve Metering Dispensation D/543 on a lifetime basis, subject to a condition.**

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 The process for applying for a Metering Dispensation is set out in [BSCP32](#)².

2. Confidentiality

- 2.1 BSCP32 allows the Metering Dispensation applicant to request confidentiality via the application form (BSCP32/4.1).
- 2.2 In this case, the applicant has noted on the application form that the application itself is not confidential. However, the applicant has requested (via email) that we keep certain related documents (Attachments B - D) confidential because they are commercially sensitive.

3. Background to Metering Dispensation D/543

- 3.1 Heysham 2 Power Station was constructed in the 1980s and began generating in 1988. There are currently two 400kV generator circuit connections (via Generator Transformer 7 and Generator Transformer 8) and two 132kV station transformer connections (via Station Transformer 7 and Station Transformer 8) (Attachments C and D).
- 3.2 The Metering Equipment for Heysham 2 Power Station was first registered under the Pooling and Settlement Agreement for England and Wales in the 1990s.
- 3.2.1 For the generator circuits:
- Active Energy Metering Equipment is installed on the lower voltage side (23kV) of the generator and unit transformers against the [Alpha Codes of Practice](#) (1990-1993) and compensated for losses (Generator

¹ 'Metering'

² 'Metering Dispositions'

Transformer only) to the Commercial Interface on the higher voltage side (400kV) – no Metering Dispensation was/is required to do this under [Code of Practice \(CoP\) E](#)³.

- Reactive Energy Metering Equipment is located on the higher voltage side (400kV) of the generator transformers and the Reactive Energy Meters are fed by capacitive voltage transformers (CVTs). The generator circuit Reactive Energy Metering Equipment is compliant with CoP1⁴ Issue 1 (1993-2006) and was deemed acceptable under CoP1 Issue 1, paragraph 5.1.3.(i), at the time:

3.3 “5.1.3 Measurement Transformers Installed on Existing Circuits

Where circuits, other than those newly installed, are to be metered to this Code of Practice and where the installed measurement transformers do not comply fully with clauses 5.1.1 & 5.1.2, then such measurement transformers may be used providing the following requirements and those in clause 4.2.1 are met.

(i) Where subsequently a significant alteration to the primary plant (eg a switchgear change) is carried out, new measurement transformers as detailed in clauses 5.1.1 and 5.1.2, shall be provided.”

- 3.4 For the station transformer circuits, Active and Reactive Energy Metering Equipment is installed on the lower voltage side of the 132/11kV station transformers to the Alpha Codes of Practice (CoPE) and are compensated for losses to the 132kV side – again no Metering Dispensation was/is required to do this under CoPE.

- 3.5 **Issue** - In January 2022, issues began with the CVT feeding the Reactive Energy Meters for the 400kV connected Generator Transformer 7 circuit. The CVT is located at National Grid Electricity Transmission’s (NGET’s) Heysham 400kV substation. Subsequent investigations with NGET discovered a failure of this original CVT. A 50m exclusion zone was enforced around the Heysham 2 NGET substation.

- 3.6 A gas leak on Generating Unit 8 occurred in Feb 2022 and, in order to resolve the gas leak, entry into the exclusion zone was required. Generating Unit 7 (Unit 7) was tripped on 11th Feb 2022 and on 12th Feb the CVT busbar was disconnected with agreement from NGET. This enabled the repair of the leak. Unit 7 was restarted on 12th Feb 2022.

- 3.7 Since 11 February 2022 the site has had no functioning Reactive Energy metering for Generator Transformer 7 circuit. It will take up to 18 months to order, procure and install a new class 0.2 wire wound VT to CoP1 Issue 2 and cost £300k. However, EDF Energy Nuclear Generation (EDF) has managed to secure a replacement CVT for the Generator Transformer 7 Reactive Energy Meters. The replacement CVT is a Trench TCVT 420 supplied from NGET stock. The replacement VT is capacitive and to class 0.5, with a single secondary winding, as is the original CVT.

- 3.8 Unit 7 was tripped on 11th March to carry out scheduled graphite outage. During this time EDF has installed the replacement CVT and are looking to energise during week commencing 28th March 2022.

4. Metering Dispensation D/543 – Heysham 2 Power Station

- 4.1 EDF has applied for a retrospective, lifetime Metering Dispensation (D/543) from [CoP1](#) Issue 2 (Attachment A). This is to use a CVT, instead of a wire wound VT⁵, to replace the failed CVT measuring Reactive Energy, for the Generator Transformer 7 circuit, at Heysham 2 Power Station.

- 4.2 EDF wish to use a new CVT because:

- it is unable to procure a wire wound class 0.2 VT to meet the requirements of CoP1 within reasonable timescales;
- whilst the replacement is a class 0.5 CVT, Reactive Energy metering requires $\pm 4\%$ accuracy as per section 4.3.1 of CoP1, which will be met with this proposed replacement CVT;
- the current scheduled outage finishes with a return to service scheduled for 6th April 2022, any delay in installation of the replacement CVT would require waiting for the next scheduled outage (circa 12 months plus). To plan an outage to specifically carry out these works would be commercially unviable;
- the original factory calibration test certificate for the replacement CVT is provided (Attachment B). The CVT complies with BS EN/IEC 61869-5 and the accuracy limits set out in BS EN/IEC 61869-3;
- it proposes to carry out periodic testing (every 3-4 years during scheduled planned outages) of the replacement CVT, and the original existing CVT on site, to ensure accuracy. If any of these results are outside the accuracy limits of the standard BS EN/IEC 61869-3, EDF will notify the ISG and seek resolution; and

³ ‘Code of Practice for the Metering of Electricity Transfers between The National Grid Company plc and Generating Companies using the National Final Metering Scheme’

⁴ ‘Code of Practice for the metering of circuits with a rated capacity exceeding 100MVA for Settlement purposes’

⁵ From 23 February 2006 CoP1 Issue 2 requires wire wound measurement transformers to be fitted.

- due to non-collection of Reactive Energy metering data (and no subsequent data substitutions/estimations by the Central Data Collection Agent (CDCA)), EDF is currently losing circa £500k per month Reactive Power income.

5. MDRG comments

5.1 We circulated the Metering Dispensation application and its attachment to the Metering Dispensation Review Group (MDRG) for comments (Attachments A - D).

5.2 Three out of four MDRG members responded. All three MDRG members support the application on the following bases:

- it is a pragmatic solution for reactive metering, which keeps the accuracy within CoP tolerances, with additional periodic testing of the CVTs to ensure that it will be picked up if the accuracy drifts;
- if there are periodic tests scheduled on the planned shutdowns. The text suggests every 3 to 4 years. This will ensure that the required accuracy is maintained; and
- while the VT isn't of wound construction as required by the current version of CoP 1, the testing regime the applicant has suggested would mitigate the risk of its accuracy drifting over time. I would suggest this is made a condition of the dispensation to ensure that it happens. Given the metering on the HV side of the generator transformer is only being used for reactive metering, the CoP1 overall accuracy limits will still be maintained even though the VT is class 0.5 (as opposed to class 0.2 as required by CoP 1) as supported by the test report. Not having separate secondary windings for the main/check meters (as required by CoP 1) does reduce the redundancy of the metering system, but in my opinion this is better than having no reactive metering for this circuit (given the lead time and financial viability of a suitable replacement VT).

6. NETSO comments

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

6.2 At the time of writing the NETSO had not responded. If we receive a response we will provide a verbal update at the ISG meeting.

7. Elexon's view

7.1 Elexon supports this lifetime, site specific Metering Dispensation application as Reactive Energy accuracy will be maintained for the Generator Transformer 7 circuit Metering Sub-System, within CoP1 limits at the DMP. We recommend the Metering Dispensation is approved subject to periodic testing of the new CVT and any existing CVTs at four year intervals, during suitable outages, until the relevant Metering Sub-Systems are de-registered at the end of Heysham 2 Power Station's life⁶.

8. Recommendation

8.1 We invite the ISG to:

a) **APPROVE** Metering Dispensation D/543 from CoP1, to use a capacitive voltage transformer (CVT) for the Generator Transformer 7 Reactive Energy Meters at Heysham Power 2 Station, on a lifetime basis, subject to EDF Energy Nuclear Generation:

- carrying out periodic calibrations of the CVT (and the other existing CVT), at suitable outages, every four years to ensure accuracy is maintained within CoP1 limits; and
- reporting to the ISG (via Elexon) if any CVT is found to be outside the limits of the relevant standard for CVTs.

Attachments

Attachment A – Metering Dispensation application D/543 – Heysham 2 Power Station (PS)

Attachment B (CONFIDENTIAL) – Appendix 1 – Capacitor voltage transformer (CVT) calibration certificate

Attachment C (CONFIDENTIAL) – Appendix 2 Part 1 – Heysham 400kV substation single line diagram (SLD)

Attachment D (CONFIDENTIAL) – Appendix 2 Part 2 – Heysham 2 PS metering SLD

⁶ According to the applicant, the end of generation date, 2028, is subject to change and may be earlier than anticipated.

For more information, please contact:

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