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## Metering Dispensation D/531 – Lister Drive Synchronous Compensation Units (SCUs)

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### Imbalance Settlement Group (ISG)

Date of meeting **1 February 2022**

Paper number **250/03**

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Purpose of paper **Decision**

Classification **Public**

Document version **v1.0**

#### Summary

**Statkraft Market GmbH has applied for a lifetime Metering Dispensations (D/531) against Code of Practice (CoP) 1. D/531 is for the location of the CoP1 metering for two new Synchronous Compensation Units (SCUs) at Lister Drive. We invite the ISG to approve Metering Dispensations D/531 on a lifetime basis, subject to a condition.**

### 1. BSC requirements

- 1.1 Section L<sup>1</sup> 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](#)<sup>2</sup>.

### 2. Background to Metering Dispensations D/531

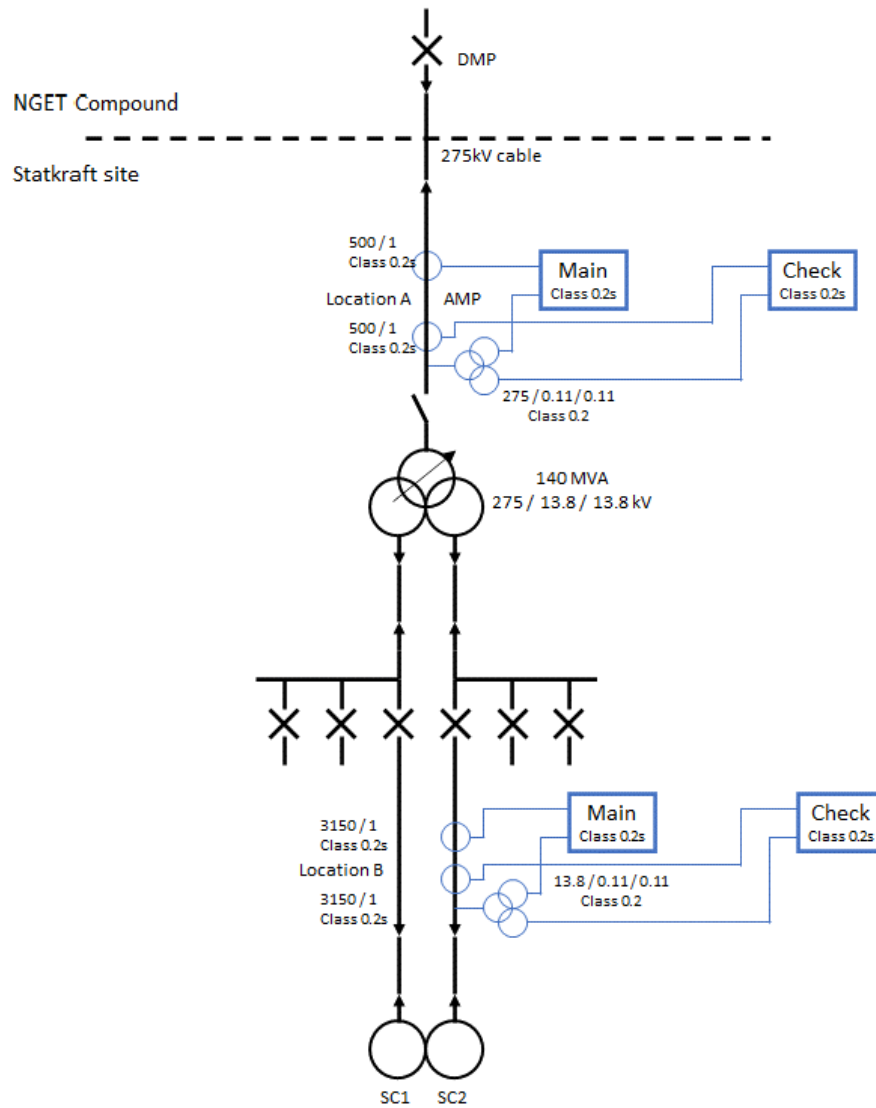
- 2.1 The Lister Drive compensation project consists of two wound field Synchronous Compensation Units (SCUs), with excitation systems, and additional inertia from adding a flywheel to each machine. Each SCU is rated at 67MVA and operates at 13.8kV. Both SCUs are connected to the 275kV Transmission System through a single dual secondary (275/13.8/13.8kV) power transformer. There is a single cable connection to a single disconnecting circuit breaker in National Grid Electricity Transmission's (NGET) existing 275kV substation.

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<sup>1</sup> 'Metering'

<sup>2</sup> 'Metering Dispensations'

2.2 A full single line diagram is attached as an appendix to this paper (Attachment B), but a sketch is shown below:



- 2.3 Statkraft has entered into two Stability Compensation Service (SCS) contracts (also known as Pathfinder projects) with National Grid Electricity System Operator (NGESO), one for each SCU, to provide inertia and Reactive Power. Since each SCS contract requires its related SCU to be individually controlled, it is necessary to register each separately as a Balancing Mechanism Unit (BMU).
- 2.4 In addition to the SCS, Statkraft would offer one or both SCUs in the Balancing Mechanism (MWh Import). This could be at times when the SCUs are not dispatched by NGESO under the existing SCS contracts or could be in the future when the SCS contracts have expired. Statkraft would also like the flexibility to expand the site in the future to include additional generation or demand, possibly including additional SCUs. The location of the Metering Equipment (which is the subject of this application) is principally to ensure MWh and MVARh Import / Export is allocated appropriately to each of the BMUs.
- 2.5 It is proposed that the total Import / Export MWh and MVARh is metered at Location A in the above sketch.
- 2.6 It is also proposed that metering of one of the SCUs (SCU2) will be located on the low voltage side of the power transformer – Location B in the above sketch. The measured values at Location B will be corrected (for MWh and MVARh) as if the measurement had been at the DMP. The difference between the values for the total Import / Export at the DMP (corrected from the measured values at Location A) and the corrected measurements at Location B will be allocated to the other SCU (SCU1).

- 2.7 There are two auxiliary power systems (for redundancy) operated in an either / or arrangement, so all of the auxiliary load will either be supplied through the Medium Voltage (MV) switchboard of SCU1 or through that of SCU2, not half each. Metering at Location B for SCU2 means that all of the auxiliary (and start-up) power used by both SCU1 and SCU2 is allocated to SCU1. Metering at SCU1 would have the same issue – all of the auxiliary power would be allocated to SCU2. This does not affect the overall Import / Export MWh and MVArh measured at Location A.
- 2.8 The cable length between the low voltage terminations of the power transformer and the MV (13.8kV) switchgear where the metering current transformers (CTs) and voltage transformers (VTs) for SCU2 are installed (Location B) is approximately 30 metres. The cable length between Location B and SCU2 (downstream of the metering point) is approximately 10 metres.
- 2.9 To allocate the losses to the correct SCU, the measurement at Location B will be corrected by the estimated losses (MWh and MVArh) between Location B and the DMP for one SCU (SCU2) i.e. a compensation factor will be applied to the Meter readings at Location B. Half of the power transformer iron losses will be added to the measured import / export at Location B and the copper losses will be scaled by the power transformer full load copper loss to give the calculated Import / Export at Location A.

A further correction will then be included for the difference in location between Location A and the DMP.

### **3. Metering Dispensation application D/531**

- 3.1 This Metering Dispensation is to allow for the location of Metering Equipment associated with SCU2 (location B on the above sketch). The second reason for seeking this Metering Dispensation is to account for the distance between the location A and the DMP, for the Boundary Point Metering Equipment.
- 3.2 The Boundary Point Metering Equipment is located in the Statkraft compound. The cable route distance between the DMP and the Cable Sealing End (CSE) in the Statkraft compound is 141m. There is then a busbar connection of 11m to the metering VT. However, the applicant has stated that the losses in the busbar will be small compared with the tolerances in the applicable Code of Practice.
- 3.3 The applicant noted that the Boundary Point Metering Equipment cannot be located at the DMP as NGET have advised that there is insufficient space in the NGET Lister Drive compound to install metering class CTs and VTs.
- 3.4 The applicant has stated that the overall rating of the project is 140MVA and so is well within the capability of a single transmission connection so a second transmission connection would not be economic.
- 3.5 Statkraft have stated that to provide compliant Metering Equipment would entail a busbar extension and provision of an additional 275kV bay to meter each BMU separately. The cost of compliant Metering Equipment would be in excess of £2M. This would also result in a delay to the project (measured in years).
- 3.6 The cost of the proposed solution is circa £50k and includes additional CoP1 compliant metering at Location B.
- 3.7 The applicant believes there will be no impact to Settlement as any errors in accounting for losses between the Import / Export at Location B (for SC2) and the DMP will be attributed to the Registrant of the Metering Equipment at the DMP, who is the same as the Registrant of the Metering Equipment at Location B.

#### 4. MDRG comments

- 4.1 We circulated the Metering Dispensation application (D/531) and attachments to the Metering Dispensation Review Group (MDRG) for comment.
- 4.2 All members agreed to have a call to discuss D/531 due to its complexity. The key points discussed and debated on the call are summarised below.
- 4.3 The MDRG noted their disappointment that the Registrant has committed to an SCS contract to provide a service for two BMUs when they have clearly recognised the need for a Dispensation, but not applied for one prior to committing to the contract with NGEN. That would appear to be a failure to use the Metering Dispensation process correctly (as per recent circular reminder) and a significant commercial risk for the Applicant if the Metering Dispensation application is refused.
- 4.3.1 The applicant originally applied for the Metering Dispensation in October of 2021. The Lister Drive SCUs are scheduled for energisation around late May/early June. Elexon advises that applicants apply for a Metering Dispensation at least 14 weeks prior to energisation of the related MSID. In this case the Registrant's application for the Metering Dispensation complied with the Elexon guidance.
- 4.4 The MDRG stated that the split use of the secondaries means that the measurements at Point B do not "correctly" allocate the Active Energy to each BMU. Therefore the BMUs do not actually measure the separation of Active Energy that they are intending to measure, even with the Metering Dispensation. By having a Boundary Point measurement, the values of the two BMUs at the Boundary Point should sum to the correct value. The measurement at point B, plus any adjustment factor, will be deducted from measurement at point A to determine the value for "BMU A" – but if the adjustment is wrong then the allocation to both BMUs will equally be wrong.
- 4.4.1 Elexon recognises that whilst Active Power may not necessarily be allocated to each SCU "correctly" (based on dynamically compensated Meter readings) the Registrant of both BMUs is the same across the two SCUs. As a result the allocation method proposed will not have an adverse impact on Settlement overall or on any other Registrants.
- 4.5 The MDRG felt that the accuracy of Reactive Energy measurement will not be possible to be achieved across all 31 tap positions, without some new undefined approach to apply corrections. Equally the measurement tolerance (+/-10%) in the power transformer manufacturer's document, for the Reactive Power load losses, exceeds the BSC accuracy requirements anyway.
- 4.5.1 The applicant responded by submitting a methodology (Attachment F) showing the effect of operating the transformer tap changer at different positions to the nominal tap (used for calculating the reactive losses). The maximum error between a different tap position and the nominal tap position is 2.79%. CoP1 allows for an error of plus or minus 4% for reactive energy when operating at zero power factor (which an SCU always does). As such the applicant believes this justifies calculating the losses using the nominal tap position.
- 4.6 The MDRG believed that due to the differencing approach and the effect this has on the allocation of Active Energy between the BMUs, a condition of the Metering Dispensation should be that the Registrant for both BMUs shall always remain the same.
- 4.6.1 Elexon agree and propose to add this as a recommended condition.
- 4.7 The MDRG noted the separate Distribution System supply (as can be seen on the attachment single line diagram (SLD)) should be interlocked to not be used at same time as the Transmission System supply.
- 4.7.1 The applicant confirmed that the distribution connection would only ever be used as a backup supply to the site auxiliary transformers when the transmission network is unavailable; and that an interlocking scheme is in place to prevent accidental paralleling of the two.
- 4.8 The MDRG noted that the Applicant describes the possibility that further load or generation, or presumably further reactive services may be added in the future. If these are planned then a new or changed Metering Dispensation should be requested, prior to any commitment/design/contractual arrangements, to ensure that accuracy within the BSC constraints can be achieved. This should be a condition of the current proposed Metering Dispensation.
- 4.8.1 Elexon believes that any addition of further load or generation would be classed as a material change as it would result in new Metering Equipment being installed at the site. As such this would result in a new application being required. Elexon note that a condition could be added to the Metering Dispensation that it

shall only remain valid subject to the configuration of Plant and Apparatus remaining the same or no additional generation or demand is added.

- 4.9 The MDRG discussed the approval of Metering Dispensations D/526 and D/527 (Killingholme SCUs) at which the ISG indicated a preference to approve those applications as the Active Energy was accounted for (within Overall Accuracy of the relevant CoP) and as Settlement was not concerned with Reactive Energy. The ISG also indicated a reluctance to hinder new pathfinder agreements between Registrants and NGEN. The MDRG believed that were this Metering Dispensation to be approved then that should potentially lead to the removal of any BSC obligation to provide reactive data.
- 4.10 The MDRG also noted a belief that if Settlement is not concerned with Reactive Energy then a change should be initiated to remove the requirement for Reactive Energy measurement from all the BSC documents, including the metering CoPs. This would require a Modification to the BSC.
- 4.10.1 Elexon noted that a Metering Dispensation can be requested against the requirements in the relevant CoPs (of which the recording of reactive energy is) for financial or practical reasons. Elexon do not believe that a “minded to” approach for the approval of similar Metering Dispensations relating to SCUs necessarily leads to the conclusion that reactive energy requirements should be removed from the CoPs. Nevertheless a BSC Party could raise a change to this effect should they feel strongly that the approval of reactive energy related Metering Dispensations leads itself to the removal of reactive energy related requirements from the CoPs.
- 4.11 The MDRG noted the need for two separate BMUs is solely related to a requirement within the commercial agreement between NGEN and the applicant for each SCU to be individually controlled. The MDRG stated their belief that:
- 4.11.1 *“The Applicant should withdraw the Dispensation, retain a single BMU at the boundary and revisit their contractual obligations with the ESO for reactive services which are stated as relying on two BMUs. One BMU at the boundary can be measured within the BSC obligations. The accuracy of any ‘within site’ measurement can become a bilateral arrangement between the Applicant and ESO.”*
- 4.11.2 The BSC accommodates Registrant’s registering separate BMU Units for Metering Equipment measuring different assets at the same site. The issue with this particular application is with allocating volumes accurately between the two BMUs. As already stated the Registrant across both BMUs is the same and so there is no impact to Settlement or any other Registrants.

## **5. NETSO comments**

- 5.1 We circulated the Metering Dispensation application (D/531) and attachments to the National Electricity Transmission System Operator (NETSO) for comments.
- 5.2 The NETSO noted a conflict of interest with this application (given the pathfinder contract) but did note that they had no concerns.

## **6. ELVA comments**

- 6.1 We circulated the Metering Dispensation application (D/531) and attachments to the Electrical Loss Validation Agent (ELVA) for assessment.
- 6.2 The ELVA confirmed that the compensation figures proposed are acceptable after initially requesting more information from the applicant which was provided.

## **7. Elexon’s view**

- 7.1 Elexon supports this application as both Active and Reactive Energy Overall Accuracy limits will be maintained within the limits described in the relevant CoP with no adverse impact to Settlement or to other Registrants.
- 7.2 Elexon proposed that a condition be added to the Metering Dispensation that the Registrant for both affected BMUs must remain the same for the Metering Dispensation to remain valid.

## **8. Recommendations:**

8.1 We invite the ISG to:

- a) **APPROVE** Metering Dispensation D/531 on a lifetime basis for the location of the CoP1 Metering Equipment associated with the Lister Drive SCUs, subject to the condition that the Registrant for both affected BMUs remains the same.

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## **Attachments**

Attachment A - Metering Dispensation Application

Attachment B - Single Line Diagram

Attachment C - Cable Design Specifications

Attachment D - Transformer Test Sheet

Attachment E - Cable Compensation Methodology

Attachment F - Power Transformer Compensation Methodology

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## **For more information, please contact:**

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