BSCP32/4.1 Application for a Metering Dispensation

Part A – Applicant Details

To: BSCCo	**Date Sent:** 08/03/2019
From: Requesting Applicant Details Name of Sender: Jonathan Priestley Contact email address: Contact Tel. No.	Contact Fax. No.
Name of Applicant Company: EDF Energy Customers Limited	
Address:	
Post Code: CR0 2RD	Our Ref: _____
Name of Authorised Signatory: Jonathan Priestley Authorised Signature: _____	Password:

Confidentiality:

Does any part of this application form contain confidential information?

Request for Confidentiality NO ***Delete as applicable***

If 'YES', please state the parts of the application form that are considered confidential, including justification below. Information that is considered confidential:
Reasons for requesting confidentiality: …… number, site name, expiry date (if any) and BSC Panel determinations will routinely be made available in the public domain unless the applicant informs BSCCo otherwise at the time of application

BSCP32/4.1 Application for a Metering Dispensation (Cont.)

Part B - Affected Party Details

Number of Affected parties_2____[1]

Contact Name at Affected party: Network Rail,	
Contact email address:	
Contact Tel. No.	Contact Tel. No.
Company Name of Affected party:	
Address:	
Post Code:	

Contact Name at Affected party: EDF Energy	
Contact email address:	
Contact Tel. No:	Contact Tel. No.
Company Name of Affected party:	
Address:	
Post Code:	

[1] For more than one Affected party, Part B should be completed for each, using additional copies of Part B as required.

BSCP32/4.1 Application for a Metering Dispensation (Cont.)

Part C – Reason for Application

If the application is an extension or update for an existing Metering Dispensation, enter existing ref: D/……..

Site Specific * **Delete as applicable.*

Describe why you require a Metering Dispensation. Include any steps you propose to limit the impact on Settlement and other Registrants:
Network Rail are currently undertaking resilience works to the existing connection at Greenhill FS supplied from Bonnybridge 132 kV GSP. The MOA (LONDCVAM) found that the existing settlement metering at 25kV utilises voltage transformers with a Class 1.0 rating rather than Class 0.5 and the current transformers are class 0.2 rather than 0.2s as per the requirement of Code of Practice 2: The Metering of Circuits with a Rated Capacity not exceeding 100 MVA for Settlement Purposes Clause 5.1.2 & 5.1.1. The assets were procured/installed due to a misalignment between Network Rail standards and CoP2. The issue has been escalated within Network Rail to the Professional Head of Electrical Power who will provide an update to asset policy such that it aligns with COP2 for future 25kV installations. The VT only utilises one secondary winding, which is used for both protection and metering equipment. The CT's are dedicated for settlements. The existing arrangement has limited burden due to the specification of the other devices in the circuit (i.e. the protection relays have low burden). Whilst the VT is wired for metering and protection purposes it is our proposal to remain as is due to the disproportionate costs associated with changing them and the disruption to the operational railway. The impact of removing the supply to replace the VTs and CTs would be the cancellation of electric trains between Edinburgh, Glasgow and Stirling resulting in significant disruption to the Scottish economy and reputational damage for the rail industry.

Period of Metering Dispensation required

Lifetime* *Delete as applicable.

If temporary, indicate for how long the Metering Dispensation is required.	

Provide justified reasoning for the period of Metering Dispensation requested in the box below:

Provide justified reasoning for the period of Metering Dispensation requested in the box below:

Rationale for duration of Metering Dispensation:

The existing arrangement, whilst non-compliant with COP2 Clause 5.1.2 & 5.1.1, has the correct accuracy class of meter (0.5s) installed and the overall accuracy will be within limits of Clause 4.3.1. It is the VT and CT that are non-compliant to COP2 rather than the meter itself. Initial review of the overall accuracy at the DMP for the 3 x feeders shows each circuit operating within limits of measurement error set out in COP2 without compensating CT/VT errors.

The impact of removing the supply to replace the VTs and CTs with the correct class would be the cancellation of electric trains between Edinburgh, Glasgow and Stirling for the duration of the changeover works resulting in significant disruption to the Scottish economy and reputational damage for the rail industry.

The metering circuit has limited burden due to the specification of the other devices in the circuit (i.e. the protection relays have low burden) whilst the VT is wired for metering and protection purposes it is our proposal to remain as is due to the good accuracy levels already present and disproportionate costs associated with changing them due to the disruption to the operational railway.

Opportunities to further reduce burden during the ongoing resilience works were investigated. This included retaining protection on the busbar VT and moving metering to the line VT (same type and class). This scenario is not considered a favourable option as the associated costs outweigh the benefits.

To clarify the current arrangement for the permanent dispensation is as follows:

- Busbar VT connects to meter and is shared with low burden protection devices (which should limit the overall accuracy errors)
- Current transformer is dedicated for metering
- Line VT’s are for protection purposes only

Part D1 - Loss Adjustments for Power Transformer and/or Cable/Line Losses

Where loss adjustments are proposed and applied (or are to be applied) to the Metering System for power transformer and/or cable/line losses, provide the following information:

Describe how do you propose to correct the Metering System to account for the losses of this power transformer?

N/A

In order to validate the loss adjustments applied (or to be applied) to the Metering System please provide the following information together with supporting data (e.g. power transformer test certificates):

N/A

What are the iron losses for this power transformer?

What are the copper losses for this power transformer?

Are there any other losses that have been taken into account? Yes/No*. If Yes what are they?

Demonstrate how these elements of loss have been used in the corrections to the Metering System.

*Delete as applicable.

Describe how do you propose to correct the Metering System to account for the losses of the power cable/line?

In order to validate the loss adjustments applied (or to be applied) to the Metering System please provide the following information together with supporting data (e.g. cable/line manufacturer's data sheet):

What is the type of power cable/line?

What is the length of this power cable/line?

What is the DC resistance of this power cable/line?

What is the impedance of this power cable/line?

What is the capacitance of this power cable/line?

Are there any other losses that have been taken into account? Yes/No*. If Yes what are they?

Demonstrate how these elements of loss have been used in the corrections to the Metering System.

*Delete as applicable.

Materiality

Please complete the following:

What is the cost of providing compliant Metering Equipment?	What does this cost entail?
Circa £670,000 • Design & Procurement of VTs - £60k • Lead Time - 12 weeks minimum • Implementation & commissioning - £50k • Design & Procurement of CTs - £60k • Lead Time - 12 weeks minimum • Implementation & commissioning - £100k • Prolongation of subcontractor up to end of July - £400k Impact of changing • Outages on substation and equipment • Loss of resilience during changeover • Additional testing • Additional assurance • Additional grid outages • Additional planning including approvals for necessary safety documentation in association with the works • Warranty period extension	Due to the project being ready to commence and the long lead time of the new Voltage Transformers (Dual Winding Secondary and Class 0.5) and Current Transformers (Class 0.2s) this would result in the additional material costs, plus the prolongation of the main contract including all subcontract costs. Additionally, there will be additional staged Isolations of the Incoming Feeds which would result in additional electrical feeding bypass arrangements being put in place and the circuit breaker being fully dismantled to replace CTs, this would also result in the switch gear supplier revalidating and warrantying the circuit breakers. This price assumes completion by end July 2019 and would incur additional costs beyond due to the contractual agreement with our subcontractors.
What is the cost of the proposed solution?	What does this cost entail?
The proposed solution is to use the existing Class 1 Busbar VT and Class 0.2 CTs. There is no cost associated with this solution as the switchgear does not have to be modified.	The proposed solution is to use the existing VT and CTs at no extra cost than the original cost of the CT/VTs and their installation and commissioning. There is no cost associated with existing solution. The Line VT's were included because of a requirement for an interlocking protection

	scheme associated with the new substation configuration (not for metering purposes).
What is the impact to Settlement of your proposed solution?	Why?
Meter accuracy	The existing arrangement, whilst non-compliant with COP2 Clause 5.1.2 & 5.1.1, has the correct accuracy class meter installed and the overall accuracy will be within limits set in COP2 Clause 4.3.1. It is the VT and CT that are non-compliant to COP2 rather than the meter itself. The metering can be compensated for the CT/VT errors, however as the overall accuracy is within limits we see no value in compensating CT/VT errors. See technical section for overall accuracy values and attached accuracy graph for each circuit.
What is the impact to other Registrants of your proposed solution?	Why?
None	Network Rail is the sole user of this connection

Site Details (for Site Specific Metering Dispensation)

Site Name:	Greenhill Feeder Station
Site Address:	Greenhill Road, Bonnybridge, FK4 2DZ.
MSID(s):	8356
Registered in: CMRS / SMRS*: *Delete as applicable.	CMRS
For SMRS, please advise of SMRA in space provided.	

Manufacturer Details (for Generic Metering Dispensation)

Manufacturer Name:	Siemens
Metering Equipment Details:	Current transformer IEC 61869-2 Voltage transformer IEC 61869-3

BSCP32/4.1 Application for a Metering Dispensation (Cont.)

Part D - Technical Details

Code of Practice details

Metering Dispensation against Code of Practice*	Code of Practice 2: The Metering of Circuits with a Rated Capacity not exceeding 100 MVA for Settlement Purposes
Issue of Code of Practice*:	Version 13.0, Issue 4
Capacity of Metering Circuits/Site Maximum Demand (MW/MVA):	24MVA
(Proposed) Commissioning Date of Metering:	Already commissioned S1& S3, S2 will be commissioned in April.
Accuracy at Defined Metering Point:	Meter Class 0.5s, CT Class 0.2, VT class 1. Overall accuracy is within COP2 limits
Accuracy of Proposed Solution (including loss adjustments):	Accuracy at the DMP is within limits detailed in COP2 Ref:4.3.1
Outstanding non-compliances on Metering Systems:	N/A
Deviations from the Code of Practice (reference to appropriate clause):	5.1.2 & 5.1.1

* insert Code of Practice number and issue

Any Other Technical Information

We have reviewed the CT/VT certs (IEC 61869-2 and the VT to IEC 61869-3) to confirm the overall accuracy at each DMP (x3) as per Ref:4.3.1 (See attached on-load test)

The burden on each circuit is at the lower end of the reference test, therefore the errors at the low end of the test were used. i.e. 7.5VA for the VT and 3.75 for the CT (25%).

Initial review of the overall accuracy at the DMP for the 3 x feeders shows each circuit operating within limits of measurement error set out in COP2 without compensating the CT/VT errors. Compensation can be made for CT/VT errors if required, however we see no value in applying compensation values as the overall error is within limits

Unfortunately for the VT/CTs we only have the 100%VA error measurements captured from the certificates and not the 25% range. Therefore, based on the assumption that the slopes are the same for the VT/CTs, we interpolate the lower 25%VA readings from the slope defined for the 100%VA measurements. Doing this gives you the equivalent 25%VA errors for the CT/VT. For example SN/ 80193064 one has one test point for the 25% burden rating but two test points for the 100% (Y=mx+c) assuming the errors are liner.

Generic dispensation D/477 allows inductive current/voltage transformers tested in accordance with IEC 61869-3 & IEC 61869-2 to be used.

The meters are supplied via a separate auxiliary terminal, therefore the VT supply (busbar) has no impact on the Meter/outstation' energisation. Any VT fail will flag on the data.

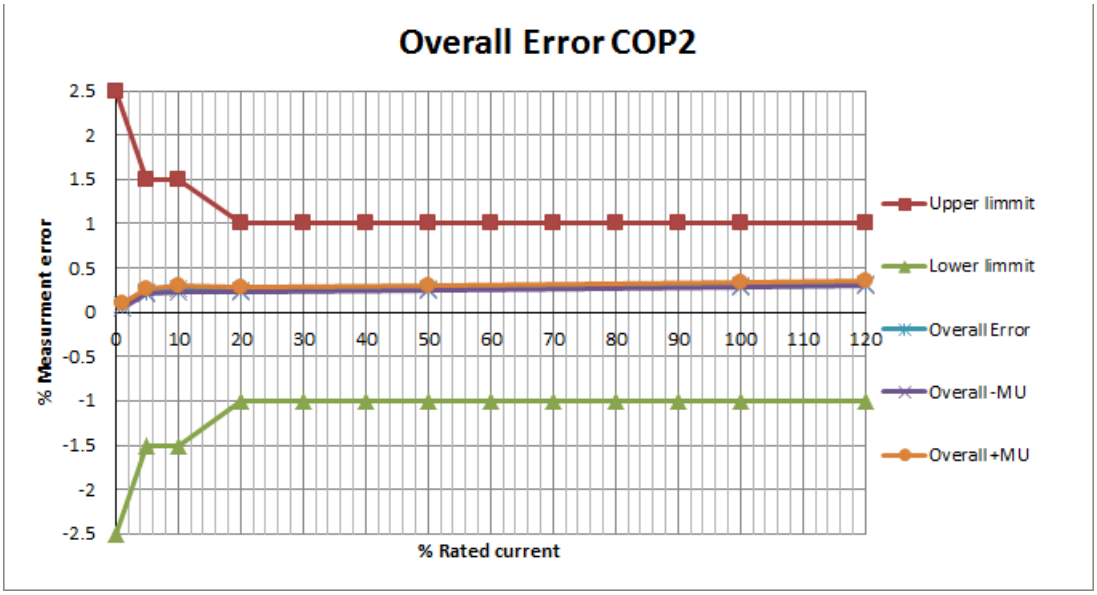
Network rail expect the typical operating load on each of the circuit to be 30-40% (expressed as a percentage of the rated current of the CTs) when the trains in use.

Overall accuracy

The overall accuracy assessment has been followed using the accuracy flowchart in MOCOPA Appendix 10 (A10.2).

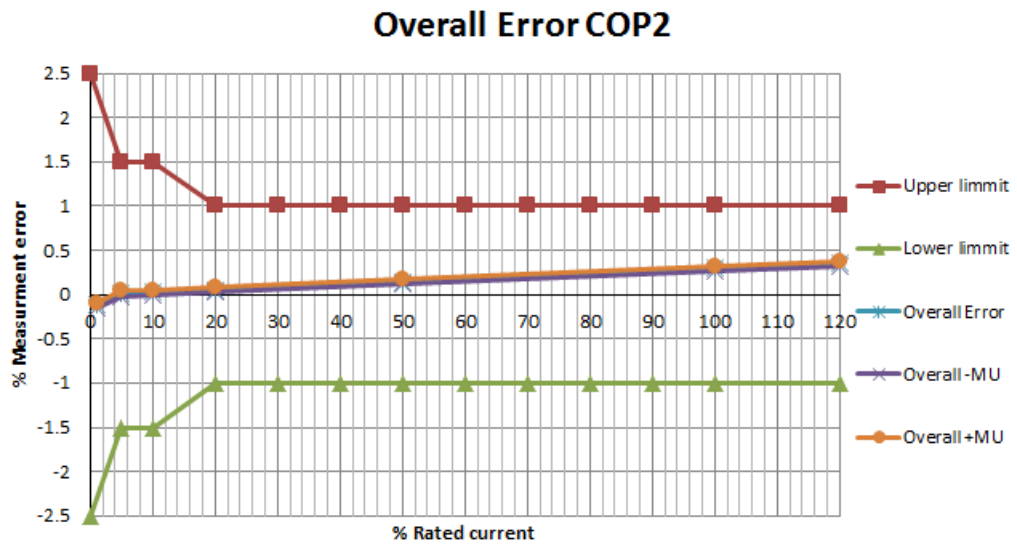
GHS3 (Feeder 3)

Overall Error VT+CT+METER		
120	0.328	PASS
100	0.31	PASS
50	0.273947368	PASS
20	0.252315789	PASS
10	0.267605263	PASS
5	0.236	PASS
1	0.0808	PASS



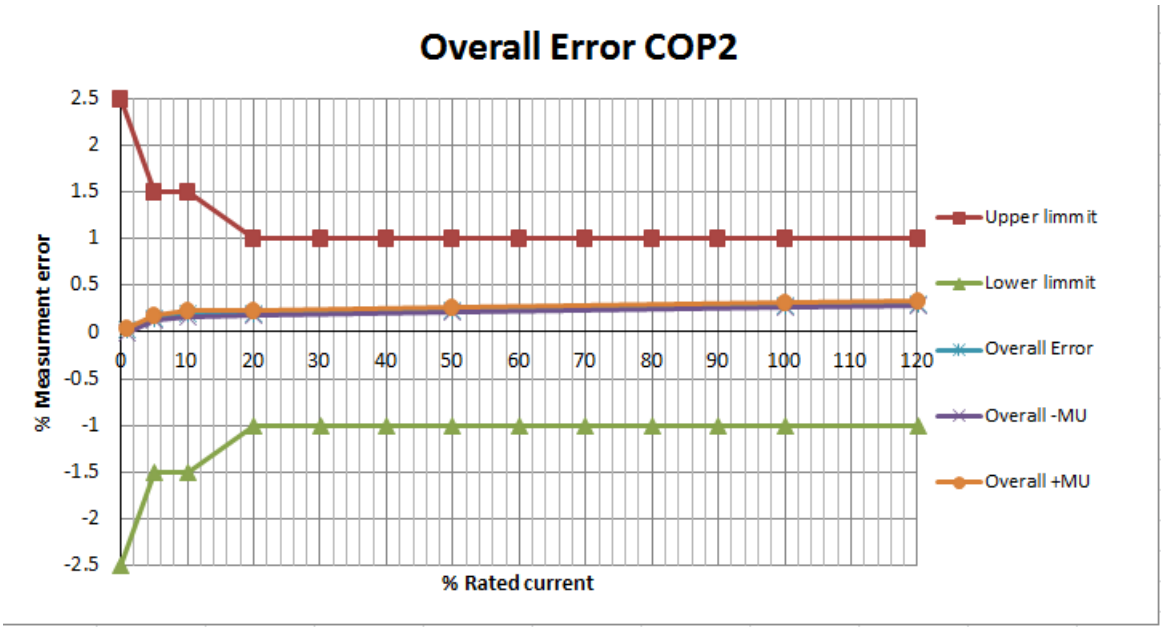
GHS2 (Feeder 2)

Overall Error VT+CT+METER		
120	0.349186441	PASS
100	0.29759322	PASS
50	0.147557538	PASS
20	0.057536128	PASS
10	0.027528992	PASS
5	0.012525424	PASS
1	-0.11779322	PASS



GHS1 (Feeder 1)

120	0.309	PASS
100	0.293	PASS
50	0.239375	PASS
20	0.2075	PASS
10	0.196875	PASS
5	0.155	PASS
1	0.018733333	PASS



Declaration -

We declare that other than as set out above we are in all other respects, in compliance with the requirements of the relevant Code of Practice and the BSC. A schematic is attached to this application for clarification of the metering points involved.

Signature: Jonathan Priestley..... Date: 08/03/2019.....

Password: .....

Duly authorised for and on behalf of Applicant Company

Confirmation of Receipt and Reference

The BSCCo acknowledges receipt of this document and has assigned the reference number as indicated on the first page.

Signature: M Smith..... Date: 23/04/2019.....

Duly authorised for and on behalf of the BSCCo