## BSCP32/4.1 Application for a Metering Dispensation

Part A – Applicant Details

| | |
|---|---|
| **To: BSCCo** | **Date Sent:** 23 September 2021 |
| **From: Requesting Applicant Details**<br>Name of Sender:<br>Contact email address:<br>Contact Tel. No. | Contact Fax. No. |
| Name of Applicant Company: SP Manweb plc | |
| Address: 3 Prenton Way | |
| Prenton | |
| Post Code: CH43 3ET | Our Ref: _____ |
| **Name of Authorised Signatory:**<br>Authorised Signature: | Password: |

**Confidentiality:**

Does any part of this application form contain confidential information?

**Request for Confidentiality YES/~~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:<br>• Metering Dispensation Caergeiliog GT2 (Technical Report)<br>• Caergeiliog1.xlsx - Losses Calculations<br>• Caergeiliog GT2 – Application for Metering Dispensation (Assessment) |
| Reasons for requesting confidentiality:<br>…Contains technical / customer number details connected to the GSP.<br>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 |


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

### Part B - Affected Party Details

Number of Affected parties__1___[1]
Does this Metering Dispensation affect the metering arrangements for a generator that has applied for/obtained a CFD Agreement? ☐Yes ☒No
If Yes, you must contact the Low Carbon Contracts Company and advise them of your Metering Dispensation application and include them as an Affected Party.
Have you notified all Affected Parties? ☐Yes ☐No

| | |
|---|---|
| Contact Name at Affected party: | |
| Contact email address: | |
| Contact Tel. No. | Contact Tel. No. |
| Company Name of Affected party:<br>National Grid Electricity System Operator | |
| Address: 1-3 Strand | |
| London | |
| Post Code: WC2N 5EH | |

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


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## 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/511.

Site Specific / ~~Generic*~~ **Delete as applicable.*

Describe why you require a Metering Dispensation. Include any steps you propose to limit the impact on Settlement and other Registrants:

As part of the Anglesey Distribution Network reinforcement scheme, SP Manweb (SPM) have installed a second 132/33kV Grid Transformer (GT) at Caergeiliog substation (GT2). This additional GT helps to maintain supplies for the underlying Amlwch/ Caergeiliog group on the isle of Anglesey.

The connection to supply GT2 from the National Grid network for this arrangement differs from typical supply arrangements elsewhere in the SPM network. The connection is ultimately derived from Wylfa GSP (with National Grid Electricity Transmission (NGET) owning and operating the 132kV busbars at Wylfa). The connection for Caergeiliog GT2 is via a teed connection to a NGET 132kV owned circuit (EV Line) at tower location EV79 which runs from Wylfa to Penrhos and the south of the island. This Tee point location is some 18km from Wylfa.

A newly constructed SPM 132kV circuit connects this "Interface" point to the SPM Network via a 1.4km circuit into Caergeiliog and GT2 and then onto the 33kV busbars. This is illustrated below.

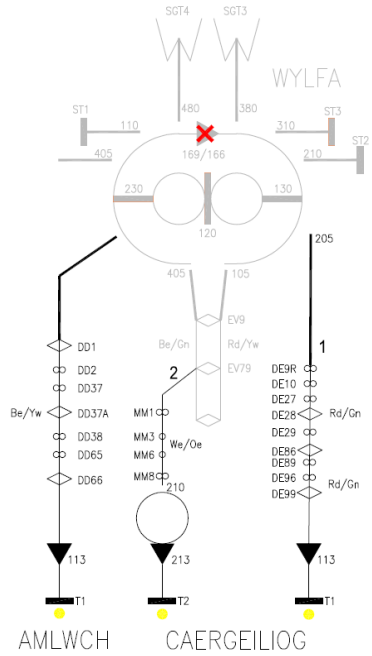


Figure 1 – Outline supply arrangement (Wylfa)


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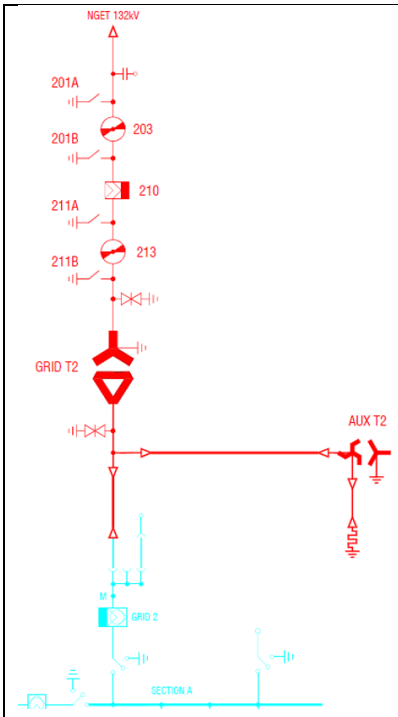


Figure 2 – Operational Diagram (Caergeiliog GT2)

All options for the metering location were considered, namely:

Option 1 – Metering at Wylfa GSP (fully compliant). A new circuit between Wylfa and Caergeiliog (18km) required plus switchgear at Wylfa is owned by NGET not SPM. Cost would be in excess of £15m to build the new circuit.

Option 2 – Metering at NGET / SPM interface point and tee off point on tower EV79 (fully compliant), would require a compound/compact substation to be installed at significant cost (£200k) for which land would need to be purchased at the current market rate.

Option 3 - Metering at 132kV at Caergeiliog (non-compliant). The cost is also high (estimated at £110k) and there is limited space within the substation. Risks to supply to the whole Island of Anglesey for these works if a common mode failure occurs was also a key consideration as Customer Interruptions (CI)/Customer Minutes Lost (CML) costs are calculated as £787k for the first hour alone.

Option 4 (non-compliant) - Locating the metering at the 33kV substation has therefore been assessed as the most practical and economic solution. This location removes the risk to supplies and ensures consistency with the existing GTs at the site which are also metered at 33kV with a dispensation approved. The cost of this solution is £35k.

To ensure the most efficient technical and economic solution is installed (Option 4), the losses for the SPM network assets from the metering location at Caergeiliog GT2/33kV to the EV79 Tee off point at the 132kV interface needs to be taken into account as these would not be accounted for at this remote metering location as they would be upstream of the metering location and so not be visible. A dispensation is therefore required.


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**Period of Metering Dispensation required**

Lifetime / ~~Temporary*~~ *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:

Rationale for duration of Metering Dispensation:

The Metering Dispensation is required for the lifetime of the connection as due to the unusual supply arrangement at the Wylfa GSP and remote location of the Caergeiliog substation it is not practical or cost effective to meter directly at the GSP or at the NGET/SPM interface point (EV79).

Metering at the 132kV side of GT2 in the Caergeiliog substation would not be compliant and requires significant works at an existing substation with limited space to accommodate the metering. It also introduces significant risk to supplies if a common mode failure occurs.

In addition, the selected solution (i.e. to meter at 33kV) meets the operational good practice of ensuring consistency and standardisation on site at Caergeiliog, in keeping with the wider Wylfa scheme i.e. the existing transformer on site at Caergeiliog (GT1), and the transformer at Amlwch are both metered at the 33kV grid breaker with line loss factors applied all the way back to Wylfa. Lifetime Metering Dispensations apply to these GTs.


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## 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?

These elements of loss will be corrected by application of parameters programmed into the Meters.

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):

What are the iron losses for this power transformer? See attached.

What are the copper losses for this power transformer? See attached.

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

The power transformer losses for the metered Caergeiliog GT2 circuit are proposed to be taken into account on the basis of the transformer's published and stamped name plate stated values and recognised parameters, P0 (No load) and Pk (Load Loss) which are based the power transformer's Factory Acceptance Tests.

These are included in section 4.3 of the Technical Report. These values are seen applied within the proposed 2nd order polynomial in Part D1 of the loss adjustment for the power transformer and Cable (i.e. $((743.79 \times LF^2)-(41.193 \times LF)+(17.08))$).

Please see 4.3 and Appendix C of the attached Technical Report for more information and how the losses are taken into account.

Are there any other losses that have been taken into account? Yes/~~No~~*. If Yes what are they?
The cable and overhead line losses (see below).

*Delete as applicable.

Describe how do you propose to correct the Metering System to account for the losses of the power cable/line?
These elements of loss will be corrected by application of parameters programmed into the Meters.

The parameters to be programmed into the Meters will be the combined totals of the power transformer and power line/cable losses.

Meters will meet the CoP2 accuracy class specifications and are CEWE Prometer W.

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? Please see attached.

What is the length of this power cable/line? Please see attached


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

What is the impedance of this power cable/line? Please see attached

What is the capacitance of this power cable/line? Please see attached

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.

The power cable and line losses for the metered Caergeiliog GT2 are proposed to be taken into account by:

- Details of the complete connectivity, SLD etc is illustrated in Section 2 of the attached Technical Report.
- Details of the electrical parameters is provided in Section 3 of the attached Technical Report.
- Details of the modelling carried out and electrical losses are provided in Section 4 of the attached Technical Report.

From these results, a loss adjustment curve is illustrated in Figure 6 and Figure 7 of the attached Technical Report. It is shown in these plots that Mid-Point average is taken as calculations were assessed at both unity and a 0.95 power factor.

Figure 6 shows that the 2$^{nd}$ order polynomial ((743.79xLF$^2$)-(41.193xLF)+(17.08)) can be added to the meters measured kW where LF is the applied load factor with reference to the 60,000kW Caergeiliog GT2 (meter measured kW/60,000).

These demonstrate the kW loss adjustment to be made to adjust the “measured” kW power measurement to that of an “adjusted” kW power measurement taking cognisance of both the power transformer and circuit losses from the measurement location to the intake boundary point.

These elements of loss will be corrected by application of parameters programmed into the Meters. The parameters to be programmed into the Meters will be the combined totals of the power transformer and power line/cable losses.

*Delete as applicable.


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**Materiality**

Please complete the following:

| What is the cost of providing compliant Metering Equipment? | What does this cost entail? |
|---|---|
| Option 1 – Metering at Wylfa GSP – approximately cost is £15m | New circuit between Wylfa and Caergeiliog (18km) required. |
| Option 2 – Metering at NGET/SPM Interface point (tower EV79) - Approximate cost is £200k plus the cost to purchase land. | Would need to install free standing 132kV/110v CT/VT unit in close proximity to the tee. Secondary wiring would need to be marshalled then fed back to the location of the metering panel incurring additional costs.<br>Accessibility would be an issue and land would also need to be purchased. |
| Option 3 – Metering at 132kV at the Caergeiliog substation. This would not be compliant (AMP not at DMP) and would require 1.4km of cable loss compensation – Approximate cost is £110k (although risk to supply could significantly increase this cost to more than £900k). | Metering at 132kV require increased civil works to accommodation the CT and VTs and as this is an existing substation with now 2 x transformers, space is limited. (Please note the estimated cost of £110k is the cost estimate to install the metering and not to retrofit).<br>In addition, the risk of losing the Isle of Anglesey as a result of a common mode failure could lead to significant impact and cost related to CI and CMLs. |
| What is the cost of the proposed solution? | What does this cost entail? |
| Approximate cost is £35k | CT/VTs are already installed via the 33kV switchgear and therefore provision is made to accommodate the metering via a standard 33kV metered switchgear arrangement. |
| What is the impact to Settlement of your proposed solution? | Why? |
| None | Proposed solution will result in volumes used in Settlement being within the required accuracy range. |
| What is the impact to other Registrants of your proposed solution? | Why? |


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| | |
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| None | Proposed solution will result in volumes used in Settlement being within the required accuracy range. |

**Site Details (for Site Specific Metering Dispensation)**

| | |
|---|---|
| Site Name: | Caergeiliog GT2 |
| Site Address: | Caergeiliog 33kV Substation, Caergeiliog, Anglesey, North Wales. |
| MSID(s): | 7425 |
| Registered in: CMRS / ~~SMRS*:~~<br>*Delete as applicable. | CMRS |
| For SMRS, please advise of SMRA in space provided. | |

**Manufacturer Details (for Generic Metering Dispensation)**

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| Manufacturer Name: | N/A |
| Metering Equipment Details: | N/A |


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

### Part D - Technical Details

**Code of Practice details**

| | |
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| Metering Dispensation against Code of Practice* | 2 |
| Issue of Code of Practice*: | Issue 4, Version 14.0 |
| Capacity of Metering Circuits/Site Maximum Demand (MW/MVA): | 60 MVA |
| (Proposed) Commissioning Date of Metering: | January 2021 |
| Accuracy at Defined Metering Point: | CoP2 limits |
| Accuracy of Proposed Solution (including loss adjustments): | Remains within CoP2 limits |
| Outstanding non-compliances on Metering Systems: | None |
| | |
| Deviations from the Code of Practice (reference to appropriate clause): | Appendix A Paragraph 3 – AMP not located at DMP at a site where more than one Distribution System connects to the same busbar which is fed from the Transmission System. |
| | |

* insert Code of Practice number and issue

**Any Other Technical Information**

Please see attached:

- Metering Dispensation Caergeiliog GT2 (Technical Report) - Confidential
- Transformer Full Factory Acceptance Test Report
- Caergeiliog1.xlsx - Losses Calculations - Confidential
- Caergeiliog GT2 – Application for Metering Dispensation (Assessment) - Confidential


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## 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: ..... Date: 23 September 2021*

*Password: .....*

Duly authorised for and on behalf of Applicant Company

## Confirmation of Receipt and Reference

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

*Signature: M Smith..... Date: 30 September 2021*

Duly authorised for and on behalf of BSCCo


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