

Modification proposal:	Balancing and Settlement Code (BSC): Improving the allocation of Reactive Power flows between Import and Export Metering Systems (P266)		
Decision:	The Authority ¹ directs that this proposal be made ²		
Target audience:	National Grid Electricity Transmission Plc (NGET), Parties to the BSC, generators connected to the distribution system and other interested parties		
Date of publication:	15 April 2011	Implementation Date:	23 February 2012

Background to the modification proposal

Shared Sites

BSC Modification P266 relates to the metering of reactive power flows³ at sites where the import and export of electricity occurs through a single connection to the distribution system (Shared Sites)⁴. Shared Sites have two metering systems, an export metering system and an import metering system, that record active and reactive electricity flows at a single connection point at the site boundary and receive separate import and export bills based upon the data recorded at the respective meters. There are two issues associated with the metering of reactive flows at Shared Sites:

Issue 1

- In order to calculate accurate Distribution Use of System (DUoS) charges for a Shared Site, a supplier must have access to data in respect of the active and reactive flows at the site boundary at a given point in time. If the reactive flow is recorded independently on a separate meter from the active flow, suppliers will be unable to calculate accurate UoS charges.

Issue 2

- Where the import and export bills at a Shared Site are paid by separate parties, one party may end up paying for reactive power flows caused by the other party. Because there is only a single connection point, it is not possible to determine which party is responsible for the reactive flow. While the extent to which this leads to one party being billed in respect of the other party's reactive power flows may vary under the different arrangements for metering reactive power, it is not possible to mitigate it entirely where import and export are metered at a single point.

Current arrangements

At present, both issues identified above may arise. Active import flows and both reactive power flows (import and export) are metered on the import metering system. Only active export flows are metered on the export metering system. As a result the export supplier may not be able to gain access to the relevant reactive power data in order to calculate accurate export charges. Where separate parties pay the import and export bills, the party responsible for the import bill may be charged in respect of reactive power flows

¹ The terms 'the Authority', 'Ofgem' and 'we' are used interchangeably in this document. Ofgem is the Office of the Gas and Electricity Markets Authority.

² This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

³ Electrical power consists of 'Active' power, which is used to power an electrical system, and 'Reactive' power, which is essentially passive but still takes up network capacity.

⁴ The term 'Shared Site' is not a defined term in the BSC.

caused by the export party. The extent to which each issue occurs depends upon the specific circumstances at the site in question and the 'workaround' used by the local Distribution Network Operator (DNO). At present DNOs try to mitigate the problems with the current metering arrangements by using one of two workarounds. These are explained in detail in Attachment A of the Final Modification Report.

BSC modification P224⁵

BSC modification P224, a similar proposal, was submitted to the Authority in September 2008. The Authority rejected P224⁶ on the grounds that insufficient analysis had been carried out to demonstrate that it better achieved the Applicable BSC Objectives.

Although P224 and P266 are similar, changes to the structure of distribution charges as a result of the introduction of the Common Distribution Charging Methodology ('CDCM') on 1 April 2010 and the expected introduction of the EHV Distribution Charging Methodology ('EDCM') on 1 April 2012, mean that the impact of implementation on customer charges will be different. The current arrangements and P266 will result in different charges when applied to the DNO's previous individual charging methodologies and different charges when applied to the CDCM and EDCM.

As a result of the change to the DUoS charging structure since P224 was rejected and P266 raised, and further consideration by Ofgem and the P266 modification group, the Authority has concluded that the concerns raised in respect of P224 are either not relevant or where relevant are not material to this decision. Our views on this aspect are summarised in **Appendix 1** to this letter.

The modification proposal

BSC modification P266 was raised by Scottish and Southern Energy in October 2010. The proposal seeks to amend the BSC so that reactive power flows will be recorded on both the import and the export meter and allocated on the basis of active flow at the time. Therefore, when the site is exporting active power, reactive power will be recorded on the export meter and when it is importing active power, reactive power will be recorded on the import meter.

The change would apply to all new customers from 23 February 2012 (the proposed implementation date) and would only apply to existing customers where work is required on their current meter and a change can be made to the meter to implement the proposed solution or where they choose to have a new meter installed.

By linking active and reactive power flows the risk of inaccurate charges for the Shared Site as a whole identified as issue 1 above would be resolved. The export supplier would have access to reactive data at times of net export and the import supplier would have access to reactive data at times of net import. As a result, each supplier would be able to calculate accurate capacity and reactive power charges for the site as a whole.

However, the risk of reactive power being charged to the wrong party at a Shared Site where separate parties are responsible for the import and export bills identified as issue 2 above would remain. As discussed above, reactive power flows at the site boundary are not necessarily caused by the party that is responsible for the active flow at the time. For

⁵ Modification can be found on Elexon's website - <http://www.elexon.co.uk/Pages/P224.aspx>

⁶ The P224 decision letter is available on Ofgem's website:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=67&refer=Licensing/ElecCodes/BSCCode/BSC>

example, when the site is exporting active power, the demand party may be responsible for the reactive flow, in which case the export party would be billed in respect of reactive power flows caused by the demand party. However, it would not be possible for one party to be charged in respect of reactive flows caused by the other party at times when the other party is responsible for the active flow, which is the scenario likely to result in the largest inaccuracies under the current arrangements.

BSC Panel⁷ recommendation

On 10 March 2011, the BSC Panel considered the draft Final Modification Report and the responses to it. The Panel unanimously recommended that the proposed Modification be made. The Panel considered that the proposal better facilitates Applicable BSC Objectives (b), (c) and (d). The Panel's views can be found in full in the Final Modification Report (FMR).

The Authority's decision

The Authority has carefully considered the issues raised by the modification proposal and the FMR dated 14 March 2011. The Authority has considered and taken into account the responses to Elexon's⁸ consultation on the proposal which are attached to the FMR⁹. The Authority has concluded that:

- implementation of the modification proposal will better facilitate the achievement of the Applicable Objectives of the BSC¹⁰; and,
- directing that the modification be made is consistent with the Authority's principal objective and statutory duties¹¹.

Reasons for the Authority's decision

The main impact of P266 is on DUoS charges for customers at Shared Sites. Therefore, in reaching its decision, the Authority has compared DUoS charging under the current metering arrangements and under P266, and considered the impact on existing customers of moving to the P266 solution.

Comparison of DUoS charging under the current arrangements and under P266

As discussed above, there are two existing charging issues at Shared Sites:

- to calculate the correct DUoS charges for the site as a whole, suppliers require data in respect of the active and reactive power flows at a given point in time (issue 1); and
- where the import and export bills at a shared site are paid by separate parties, one party may be charged for reactive power flows caused by the other party (issue 2).

It is clear that the first issue exists under the current arrangements but would be resolved under P266. By linking reactive power flows with the net active flow, suppliers

⁷ The BSC panel is established and constituted pursuant to and in accordance with Section B of the BSC.

⁸ The role and powers, functions and responsibilities of Elexon are set out in Section C of the BSC.

⁹ BSC modification proposals, modification reports and representations can be viewed on the Elexon website at www.elexon.co.uk

¹⁰ The applicable objectives are at Standard Licence Condition C3 of NGET's transmission licence: see page 136 at the following link - http://epr.ofgem.gov.uk/document_fetch.php?documentid=15246

¹¹ The Authority's statutory duties are wider than matters which the Panel must take into consideration and are detailed mainly in the Electricity Act 1989 as amended.

would always be able to calculate accurate DUoS charges for Shared Sites as a whole. P266 would therefore result in more accurate and cost reflective charges at Shared Sites where the import and export bills are paid by the same party.

The second issue occurs under the current arrangements and would continue to occur under P266. However, the extent to which the issue impacts individual customers will vary between the status quo and P266 depending on the characteristics of the demand and generation at a Shared Site. In our view, the impact of this issue is likely to be less under P266. This is because, by linking the reactive flow to the net active flow at the site boundary, P266 would remove the possibility of a party being charged in respect of reactive flows where it is not responsible for the net active flow. It is this scenario that is likely to result in the largest charging anomalies under the current arrangements.

In our view P266 would therefore provide more cost reflective DUoS charges for the majority of customers at Shared Sites.

Applicable Objective (b) 'the efficient, economic and co-ordinated operation by the Transmission Company of the national electricity transmission system'

The modification group considered, and the panel agreed, that by more accurately allocating reactive power usage, and applying appropriate DUoS charges, the consumption of reactive power should reduce. This, in turn, would incentivise reduced reactive power flows on distribution networks and, over time, on the transmission system, increasing its efficient and economic operation.

We acknowledge that implementing P266 may in some instances incentivise generators, previously not charged in respect of reactive power flows, to reduce their reactive power usage. However, we do not consider that the modification group has provided firm evidence that the extent of any reduction will have a material effect on the transmission system. Therefore, we do not consider that P266 better achieves applicable objective (b).

Applicable Objective (c) 'the promotion of effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity'

The modification group considered, and the panel agreed, that P266 would also promote effective competition in the generation and supply of electricity in the following areas:

- A market for ancillary services for generation plant;
- A market for trading reactive power volumes;
- The operation of distribution systems;
- The supply of electricity to generators.

We do not consider that the modification group has provided sufficient evidence or argument to demonstrate that the implementation of modification P266 will have any effect on competition in the areas listed above.

However, it is our view that P266 would promote competition in the generation of electricity. More cost reflective and consistent charges would, by reducing over and under charging, provide a level playing field on which generators can compete and reduce the risk of inaccurate charges which may otherwise create a barrier to entry. Therefore, we consider that P266 would better facilitate the achievement of objective (c) in relation to the generation of electricity.

Applicable Objective (d) 'the promotion of efficiency in the implementation and administration of the balancing and settlement arrangements'

The modification group considered, and the panel agreed, that by aligning the BSC with the CDCM, P266 would promote efficiency in the implementation and administration of the balancing and settlement arrangements.

We note that, under the current balancing and settlement arrangements and the CDCM, suppliers are unable to charge for certain reactive units metered on the import meter at a Shared Site. Through P266, all reactive units can be charged and accounted for through settlement. In our view, changing the BSC arrangements so that all reactive power units may be charged for promotes efficient implementation of the BSC arrangements. Therefore, the Authority considers that P266 would better achieve objective (d).

Impact on existing customers

The modification group carried out qualitative and quantitative analysis to understand the impact on customer charges¹². This was limited by a number of factors outwith its control, including that the EDCM is yet to be finalised and that it is not possible to ascertain which party is responsible for reactive power flows at the site boundary.

While ideally we would prefer to have a better understanding of the impact of approving the proposal on customer charges, we do not feel that the limitations on the information available to us on this aspect provide us with sufficient cause not to approve a change that will result in more cost reflective charges for the majority of customers.

Decision notice

In accordance with Standard Condition C3 of NGET's Transmission Licence, the Authority hereby directs that modification proposal BSC P266: "Improving the allocation of Reactive Power flows between Import and Export Metering Systems" be implemented.

Rachel Fletcher
Director, Distribution

Signed on behalf of the Authority and authorised for that purpose

¹² For details please see the modification report.

Appendix 1: Concerns in respect of BSC modification P224

A summary of the Authorities concerns in respect of BSC modification P224 and the reasons we no longer consider them to be relevant or material to our decision in respect of P266 are as follows:

1. The Authority was concerned that the analysis provided by the P224 modification group covered an insufficient number and range of sites to demonstrate the P224 modification group's view that a reduction in demand charges if P224 was implemented would outweigh any increases in export charges.

We are no longer concerned on these points. As a result of the introduction of the CDCM, described above, the P266 group is no longer of the view that implementation of P266 would result in a reduction in demand charges that is greater than any increase in export charges. We also note that the analysis carried out in respect of P266 covers a greater range and number of sites than the analysis carried out for P224.

2. The Authority was concerned that the analysis did not demonstrate that misallocation of reactive power would not continue under P224.

Having given this further consideration, we have come to the conclusion that misallocation of reactive power will occur under the current arrangements and under P266, but is not something that can be addressed through changes to metering arrangements. This is not therefore a material concern in respect of our decision on P266.

3. The Authority was concerned that the analysis had not addressed a specific scenario raised by Ofgem, under which misallocation of reactive power may be likely to occur – a Shared Site at which the generation and demand were of similar size and the generator was able to minimise its reactive power flows while the demand customer is not.

Having considered this matter further we have concluded that while misallocation of reactive power may still occur in this scenario, in many cases the generator should be able mitigate the impact on its charges by adjusting the power factor at which it operates. Where necessary the generation and demand parties are free to enter into commercial arrangements between themselves to achieve this.