Stage 03: Assessment Consultation

What stage is this document in the process?

01 Initial Written Assessment

02 Definition Procedure

03 Assessment Procedure

04 Report Phase

P266:

Improving the allocation of Reactive Power flows between Import and Export Metering Systems

P266 seeks to resolve anomalies in the allocation of Reactive Power flows on sites where Import demand (supplied by a Licensed Supplier) and Export from Exemptable Generating Plant (e.g. embedded wind powered generators) share a common connection to the Distribution System.

Modification Group initially recommends Approval of P266

High Impact:
Suppliers, Licence Exemptable Generators, Licensed Distribution System Operators, Half Hourly Data Collectors and SVA Half Hourly Meter Operator Agents

Medium Impact:
BSC Procedures and Codes of Practice

Low Impact:
MRA Data Transfer Catalogue

Contents

About this document:

The purpose of this Assessment Consultation is to obtain views or further evidence from BSC Parties and other interested parties on matters discussed in this document. The P266 Modification Group will then discuss the consultation responses before making its recommendations to the Panel on 10 February 2011.

There are 4 parts to this document. This is Part 1. Part 1 provides details of the solution, impacts, costs, benefits and the potential implementation activities associated with this change. Part 2 (Attachment A) sets out the impacts of P266 solution on different types of customers and Ofgem's questions, accompanied by a spreadsheet Attachment B. Part 3 (Attachment C) is the Assessment Consultation Questions response form, which includes all the questions highlighted in Part 1 of the Assessment Consultation document. Part 4 (Attachment D) is the Draft Legal Text for the Proposed solution.

Any questions?

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1 Summary

Why change?

The BSC currently treats each flow of Reactive Energy as an 'Import' or 'Export' in its own right, independent of the associated flows of Active Energy. These flows are then allocated to Parties in accordance with the rules in BSC Section K1.2.2, which do not always allocate the Reactive Power to the same Metering System as the associated Active Power.

This causes anomalous allocation of Reactive Power flows on sites where Import demand (supplied by a Licensed Supplier) and Export from Exemptable Generating Plant (e.g. embedded wind powered generators) share a common connection to the Distribution System. This leads to anomalous Distribution Use of System (DUoS) charges; either under- or overcharging can occur (compared with the charges that should have been incurred based on the actual activities of sites).

Solution

Revise the Code to allocate the Reactive Power to the Party responsible for the associated flow of Active Power (either Import or Export). The aim is to resolve anomalies in the allocation of Reactive Power flows, enabling more appropriate DUoS charging. Reactive Power allocation will be improved for sites with shared connections in both Settlement Periods when the site Exports and Settlement Periods where both Import and Export takes place. P266 would not be retrospective, but the solution could be employed voluntarily on existing sites.

Impacts

There would be no impact on BSC systems, processes and BSC Agents. There may be an impact on LDSOs' DUoS billing processes following implementation of the P266 Proposed solution. There would be potential impacts on HHDCs' and MOAs' processes and systems.

Suppliers and Exemptable Generators would not be directly impacted by implementation of P266, but there would be a consequential impact on the DUoS bills they receive due to the change in how Reactive Power is allocated.

The estimated ELEXON cost is £4.8K to progress P266. ELEXON would implement changes to BSCPs and CoPs for P266 as part of a BSC Release and would raise a DTC Change Proposal (CP) to effect the changes to the DTC.

Implementation

The Group's preliminary view is that P266 should be implemented on:

- 23 Feb 2012 (February 2012 Release) if Approval is received from the Authority before 29 April 2011; or
- 28 June 2012 (June 2012 Release) if Approval is received from the Authority by 2 September 2011.

The Case for Change

The Group's unanimous initial view is that the Proposed Solution will better facilitate Applicable BSC Objectives (b), (c) and (d) as P266:

- allows for appropriate cost signals to be sent to participants regarding Reactive Power, which will tend to ultimately facilitate efficient operation of the Transmission System - Objective (b);
- rectifies the inappropriate allocation of Reactive Power and associated DUoS charges and thereby removes a barrier to participation in the market - Objective (c); and

- ensures consistency between BSC and the Common Distribution Charging Methodology (CDCM) – Objective (d).

Recommendations

The Group's unanimous initial recommendation is that P266 Proposed should be approved.

2 Why Change?

Background

Electrical Power is composed of two components: **Active Power** and **Reactive Power**. Reactive Power decreases the capacity of a circuit to transmit Active Power; therefore an increase in Reactive Power results in a decrease in the efficiency of the transmission of Active Power by a circuit. Because of this, Licensed Distribution System Operators (LDSOs) employ a system of charging Parties for excessive flows of Reactive Power. These charges are intended to discourage production of Reactive Power, and thereby minimise the action needed to maintain efficiency of transmission.

Where a customer has on-site Generating Plant (and Import/Export metering to measure flows of electricity from that Generating Plant onto the Distribution System) their Supplier is required to register separate Metering Systems for **Import** and **Export**. Industry systems and agreements (including in particular the Master Registration Agreement (MRA)) do not allow a single Supplier Volume Allocation (SVA) Metering System to be used for both Import and Export.

The method used to allocate Reactive Power flows to Import or Export Metering Systems can significantly impact the customer's Distribution Use of System (DUoS) charges, because the methodology for calculating DUoS charges specifies charges for each **MPAN**, not for each customer. Allocation of the Reactive Power between Metering Systems can therefore have a significant impact on the appropriateness of the DUoS charges levied on customers with on-site Generating Plant.

Issue

The BSC currently treats each flow of Reactive Energy as an 'Import' or 'Export' in its own right, independent of the associated flows of Active Energy. These flows are then allocated to Parties (and hence the Metering Systems registered by those Parties) in accordance with the rules in K1.2.2, which do not always allow the Reactive Power to be allocated to the same Metering System as the associated Active Power. In particular, K1.2.2 states that responsibility for Reactive Import lies with 'the person who supplies electricity to those premises' (i.e. the Import Supplier). This applies irrespective of whether the Reactive Import arises from electricity supplied by the Supplier (i.e. demand with lagging **power factor)**, or from electricity produced by a generator (i.e. Exemptable Generation with leading power factor).

In the Proposer's experience, this approach leads to disproportionately large flows of Reactive Power being allocated to some Import Metering Systems (e.g. those at wind farms where the installed generating capacity is large in comparison to the on-site demand). This leads to spurious charges for 'excess' Reactive Power and 'excess' Capacity being levied on those customers, even though their operation should have enabled them to stay within their agreed capacities and power factors. These charges do not reflect the customer's actual behaviour, and arise purely because the Reactive Power flows have been allocated to a different Metering System to the associated Active Power flows.

Anomalous allocation of Reactive Power can lead to either DUoS under- or overcharging (compared with the charges that should have been incurred to reflect customers' actual behaviour).

Related changes

Modification Proposal P224 was raised by E.ON UK plc and followed consideration of the same issue as Standing Modification Group Issue 24 'Impact of BSC on Reactive Power Charging'. P224 was rejected by the Authority, because the evidence presented to the

Electrical Power

Active Power is what is generally referred to when talking about 'electricity', and can be used to power electrical equipment.
Reactive Power is a phenomenon associated with the flow of electrical energy around a circuit (such as the Distribution System).

Metering Point Administration Number (MPAN)

MPAN is a unique number relating to a Metering Point under the MRA (Supplier Volume Allocation equivalent of Metering System Identifier)

Power factor

Is the ratio of energy transported(kW) to network capacity used (kVA)

Authority was insufficient for it to establish whether the proposal would, as a whole, better facilitate the Applicable Objectives compared to the existing arrangements.

The P266 Proposer has delayed raising this Modification Proposal to see if the new rules for **Reactive Power charges** and Capacity Charges in the Common Distribution Charging Methodology (introduced in April 2010) satisfactorily mitigate the impact of this BSC defect. However, the Proposer has stated that he continues to receive invoices for what he considers to be spurious DUoS charges.

The P266 Proposer believes that this new method for allocating Reactive Power flows to Metering Systems will, on the whole, lead to more cost-reflective DUoS charges for sites with Licence **Exempt Generating Plant**. However, given Ofgem's stated concern that the P224 analysis did not demonstrate this adequately, the Proposer expected the Modification Group to take into account the impact on charges under the CDCM for a variety of different types of generator, in order to verify that spurious allocation and charges arise under the current arrangements and that P266 would improve the situation.

Exemptable Generating Plant

Generating plant that are exempt from the requirement to hold an electricity licence to operate because their export capability is below a threshold (100MW in England and Wales)

Reactive Power Charges

LDSO charge for Party operation (i.e. Supply or Generation) that results in associated Reactive Power in excess of an agreed value (billed in units of kVArh)

3 Solution

The P266 Modification Group unanimously agreed that the P266 Proposed solution should be identical to the P224 Proposed solution, that is:

- Amend paragraph **K1.1.4** of the BSC to clarify that an 'Import' or 'Export' of electricity includes both the flow at that Boundary Point at that instant. This ensures that Reactive Power flows are not separated (for purposes of reporting and billing) from the associated flows of Active Power;
- New **Section K** requirement to meter Reactive Power at times of Active Import ('Active Import Related Reactive Energy') separately from that at times of Active Export ('Active Export Related Reactive Energy'). This requirement may need to be subject to appropriate exceptions (e.g. existing sites that do not have the appropriate Metering Equipment, Non Half Hourly Metering Systems);
- New paragraph **K1.2.7** to specify where the Active Export Related Reactive Energy and Active Import Related Reactive Energy do not need to be measured separately:
  (a) All NHH sites;
  (b) All CVA-only sites;
  (c) Non-mandatory HH sites where the relevant CoP specifies a different approach in relation to Reactive Energy. In particular, the Group agreed that Metering Systems with whole current metering (as opposed to measurement transformers) should be not be required to comply with the P266 metering requirements (and this would be identified as an exception in the relevant CoPs); and
  (d) Sites where the version of the relevant CoP (or Metering Dispensation) pre-dates the implementation of P266

  The decision to exclude whole current metering was intended to prevent any impact on the rollout of smart metering to Profile Classes 1-4, and to ensure consistency with Change Proposal CP1298. This change was implemented in February 2010 and through BSCP514 2.3.2(f) placed a requirement on the MOA, "When installing or reconfiguring Half Hourly Metering Equipment that is operated by measurement transformers, the MOA shall configure the Metering Equipment to record Half Hourly demand values for both Reactive Import and Reactive Export (except where the Metering Equipment does not have this capability, and is not required to do so by the relevant Code of Practice)";

Modification P224

Please see the P224 Modification Report for full details of the proposed solution.

- The solution will not be applied retrospectively because this change impacts the Metering requirements. Compliance with the new requirements will only apply to existing sites when a material change is made to the metering on that site;
- In order to minimise impact on industry systems, no changes would be required to the Measurement Quantity Ids used to report Reactive Power. Lagging Reactive Power associated with Active Import and Leading Reactive Power associated with Active Export will continue to be reported as Measurement Quantity 'RI' (Reactive Import); while Leading Reactive Power associated with Active Import and Lagging Reactive Power associated with Active Export will continue to be reported as Measurement Quantity 'RE' (Reactive Export); and
- ELEXON would implement changes to **metering Codes of Practice** (CoPs) and BSCPs for P266 as part of a BSC Release and would raise a DTC CP to effect the changes to the DTC.

Section 6 of this document captures the more detailed views of the Group and Ofgem when considering impacts of P266 solution as well as the Distributors' current work arounds of Common Distribution Charging Methodology (CDCM).

Configuration of Meter Registers

Currently four Measurement Quantity IDs are used for Meter Registers: Active Export (AE), Active Import (AI), Reactive Export (RE) and Reactive Import (RI). For shared Import/Export sites, the BSC prescribes that AE volumes are allocated to the Party associated with the Export of the site ('the Export Party') and AI volumes are allocated to the Party associated with the site's Import ('the Import Party').

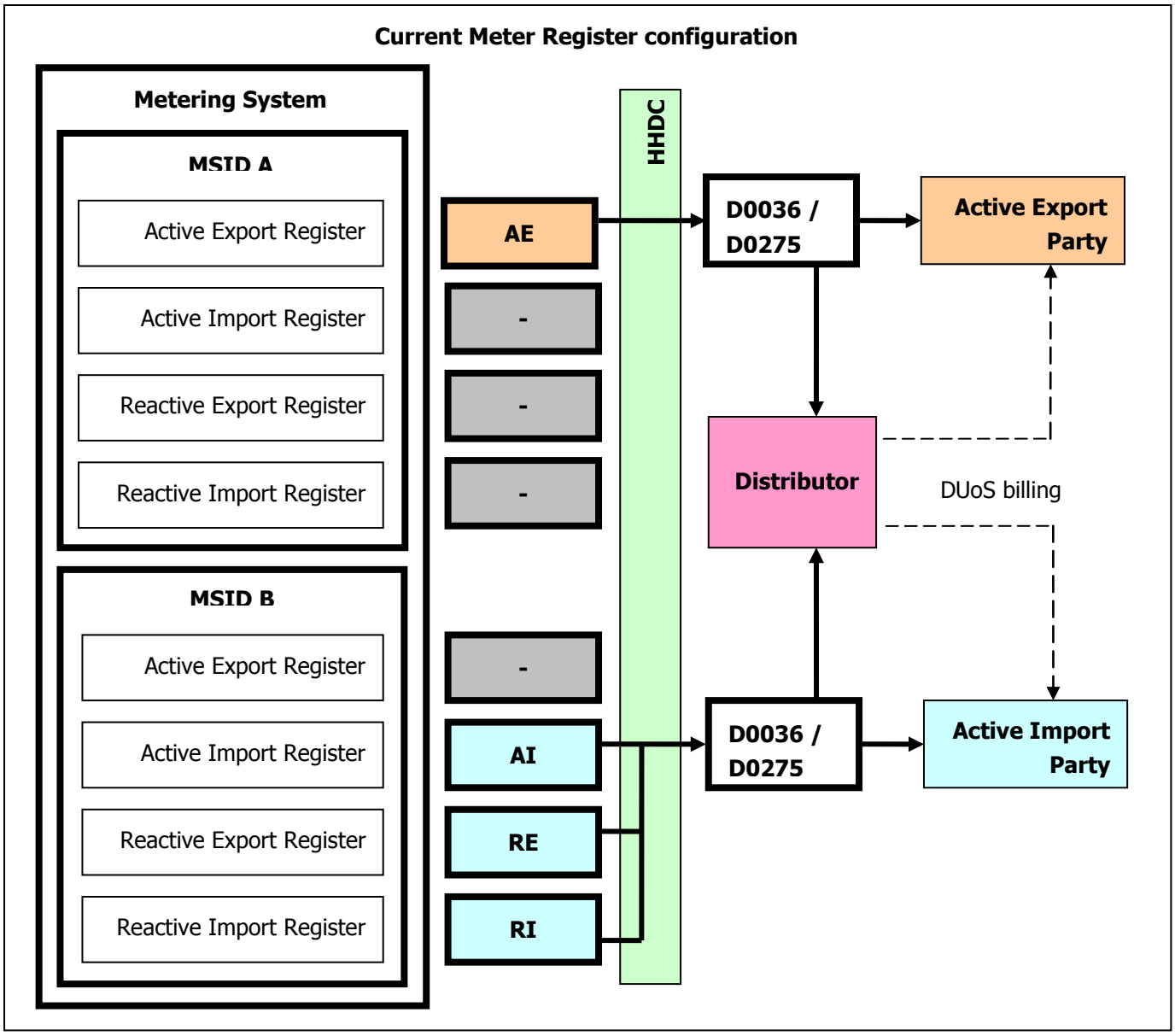

Figure 1: Current Meter Register configuration

The current BSC baseline obliges the Import Party to be allocated the RI volumes for shared Import/Export sites, and permits either the Import Party or the Export Party to be allocated the RE volumes for such sites. In practice both the RE and RI volumes are normally allocated to the Import Party (irrespective of whether those Reactive Power flows are associated with Active Import or Active Export). These configurations of the Meter Registers are translated into the structure of the data flows from HHDCs (or as the case may be the CDCA) which report RE and RI volumes to the Party and the relevant Licensed Distribution System Operator (LDSO), as shown in figure 1.

Under the P266 Proposed solution (same as P224 Proposed solution), the Meter Register Measurement Quantity IDs would not be changed.

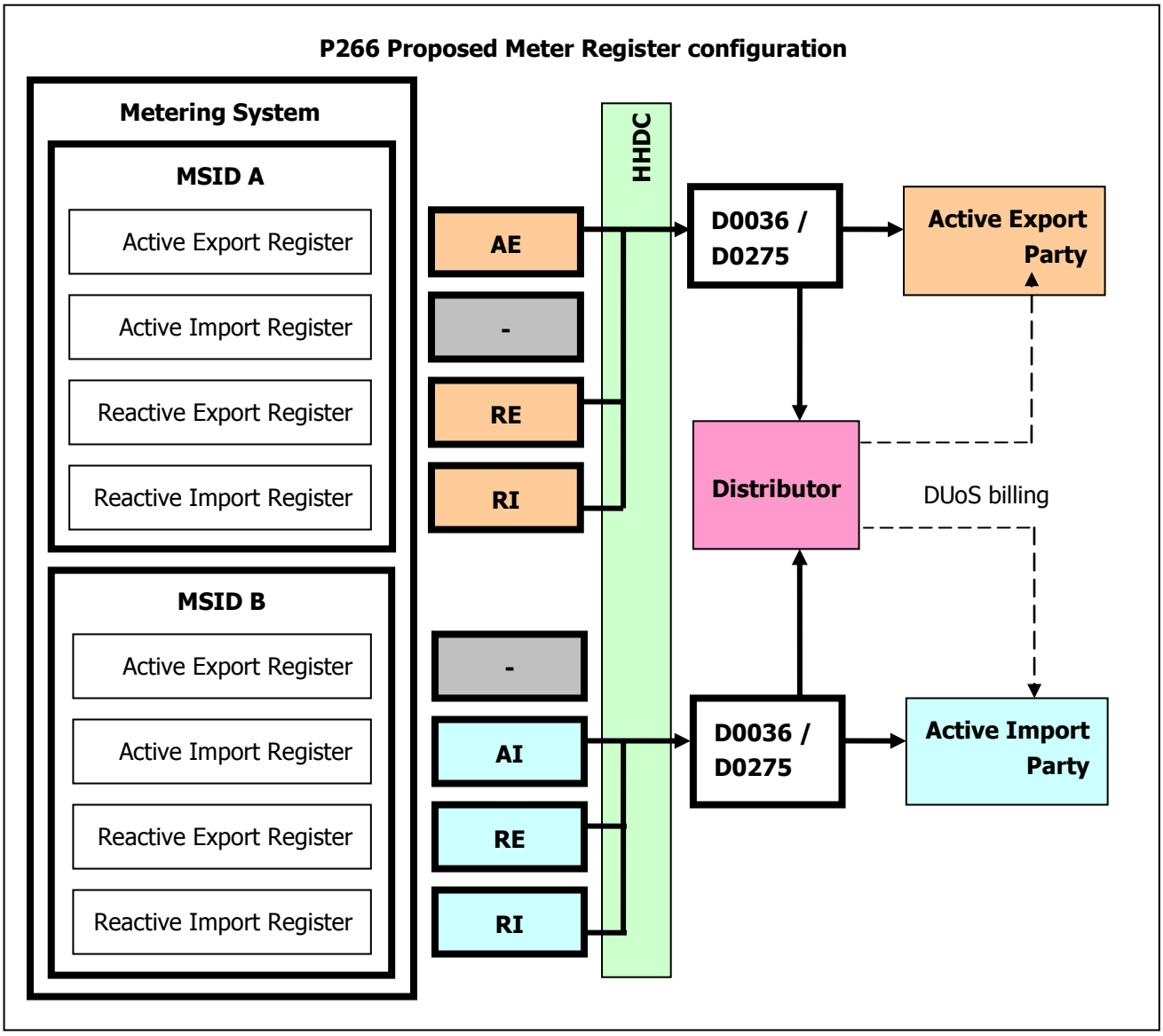

Figure 2 P266 Proposed Meter Register configuration

For the avoidance of doubt: if a site is exporting Active Energy, only the meter registers on MSID A (in the configuration illustrated in Fig. 2) will record Active Export flows and associated Reactive Power, and *no quantity will be measured by MSID B at that instant*. Conversely, if a site is importing Active Energy, only Active Import flows and associated Reactive Power flows will be recorded on MSID B, and *no quantity will be recorded on the MSID A meter registers at that instant*.

The proposed configuration of Meter Registers under P266 is illustrated in figure 2. Note that under P266 the existing Measurement Quantities will be used as follows:

- Measurement Quantity '**RI**' (Reactive Import) on the Export MSID for leading power flows associated with Active Export;
- Measurement Quantity '**RE**' (Reactive Export) on the Export MSID for lagging power flows associated with Active Export;
- Measurement Quantity '**RI**' (Reactive Import) on the Import MSID for lagging power flows associated with Active Import; and
- Measurement Quantity '**RE**' (Reactive Export) on the Import MSID for leading power flows associated with Active Import.

If registers are configured as intended and Meter software is appropriately amended then the Metering Systems of shared Import/Export sites can allocate Reactive Power to the appropriate MSID as determined by the allocation methodology of the P266 solution.

Provision for alternative approaches to Reactive Power within CoPs within specific limits

The provisions of the P266 solution apply to shared Import/Export sites that are settled on a Half Hourly basis unless such a site meets both of the following criteria:

- Its use of Half Hourly metering is not mandatory (i.e. its Import is below the threshold for mandatory Half Hourly metering, currently 100kW, and its Export is below the microgeneration limit, currently set at 30kW); **and**
- There is specific provision for exception from the P266 provisions in the applicable metering CoP.

The Group agreed that P266 should not be applied to Metering Systems that use whole current metering. This will be achieved by including an appropriate provision in all of the CoPs relevant to elective Half Hourly metering.

The Group were primarily concerned with ensuring the solution did not create a potential barrier to competition by preventing the utilisation of future technology that may provide for small scale generation and Import, but not have any material issue relating to Reactive power allocation. The criteria detailed above are believed to accomplish this, as they allow the CoPs to be revised through the BSC Change Proposal process to accommodate any such technology, while maintaining an obligation on mandatory Half Hourly metered sites which cannot be changed by a CP.

Question 1
Are there alternative solutions that the Modification Group has not identified, that they should consider?
The P266 Group invites you to provide a response to this question in Attachment C.

4 Impacts & Costs

ELEXON Implementation Costs

The estimated ELEXON implementation costs are shown in the table below:

	Implementation Cost[1]	Tolerance
ELEXON Implementation Resource Cost	20 man days (£4,800)	±10%

Industry Implementation Costs

The Group invited you to provide your estimated implementation costs for P266 Proposed solution.

Question 2 – Distributor Specific Question

If Proposed Modification P266 is implemented, what would be the cost (if any) to your organisation as a **Distributor** of changing your billing procedures? Specific solution aspect for consideration is:

- Receiving amended D0036 and D0275 flows

The P266 Group invites you to provide a response to this question in Attachment C.

Question 3 – HHDC Specific Question

If Proposed Modification P266 is implemented, what would be the cost (if any) to your organisation as **HHDC**? Specific solution aspects for consideration are:

- Reconfiguration of meter registers by the MOA and receipt of notification of this via the D0268;
- Allocation of the six meter register quantities to the appropriate Party, particularly allocation of three quantities to the Export Party; and
- Production of amended D0036 and D0275 flows

The P266 Group invites you to provide a response to this question in Attachment C.

Question 4 – MOA Specific Question

If Proposed Modification P266 is implemented, what would be the cost (if any) to your organisation as **MOA**? Specific solution aspects for consideration are:

- Installation of the six meter registers; and
- Sending D0268 flow to HHDC

The P266 Group invites you to provide a response to this question in Attachment C.

Question 5 – Supplier Specific Question

If Proposed Modification P266 is implemented, what would be the cost (if any) to your organisation as **Supplier**? Specific solution aspect for consideration is:

- Receiving amended D0036 and D0275 flows

The P266 Group invites you to provide a response to this question in Attachment C.

[1] Note these are the estimated maximum costs associated with implementation of P224 in a scheduled BSC Release; costs associated with project management etc may be reduced if other changes which impact the same areas are implemented in the same Release.

Impacts

Impact on BSC Systems and processes

No impact.

Impact on BSC Agent/service provider contractual arrangements

No impact.

Impact on BSC Parties and Party Agents

P266 proposed solution may have impacts on LDSOs' (and Suppliers') DUoS billing processes. However, the majority, if not all, of the impacts on DUoS billing would be due to changes that LDSOs (and Suppliers) would voluntarily make to improve their billing processes to benefit from P266.

There would be potential impacts on HHDCs and MOAs, with process and system changes.

HHDCs would need to:

- Reconfigure meter registers by the MOA and receipt of notification of this via the D0268;
- Allocate six meter register quantities to the appropriate Party, particularly allocation of three quantities to the Export Party; and
- Produce amended D0036 and D0275 flows.

MOAs would need to:

- Install six meter registers; and
- Send D0268 flow to HHDC.

Impact on Transmission Company

No impact.

Impact on ELEXON

ELEXON would implement P266 as part of a BSC Release. ELEXON would make the changes to the Code, metering CoPs and BSCPs needed to effect the P266 solution.

ELEXON would also provide support and guidance to Parties implementing P266 in their systems and processes, and would provide support regarding any audit changes due to the revised requirements.

ELEXON's operational working procedures would also need to be updated to reflect the revised requirements; monitoring of submission of MTDs may potentially be undertaken.

Impact on Code

Code section	Potential impact
K	New and amended terminology, change to obligations.
L	Reference to Section K.
X-1	Changes to definitions.

Impact on Code Subsidiary Documents

Impact on Code Subsidiary Documents	
CSD	Potential impact
BSCP20 'Registration of Metering Systems for Central Volume Allocation'	Consequential changes to requirements due to the changes to Code Provisions.
BSCP514 'SVA Meter Operations for Metering Systems Registered in SMRS'	Consequential changes to requirements due to the changes to Code Provisions.
BSCP502 'Half Hourly Data Collection for SVA Metering Systems Registered in SMRS'	Consequential changes to requirements due to the changes to Code Provisions.
BSCP601 'Metering Protocol Approval and Compliance Testing'	Consequential changes to requirements due to the changes to Code Provisions.
All Metering Code of Practices	Consequential changes to requirements due to the changes to Code Provisions.

Impact on Core Industry Documents and other documents
Potential impact on the DCUSA.

Impact on other Configurable Items
No impact.

Other Impacts
No impact.

5 Implementation

The Group's preliminary view is that the Implementation Date of P266 should be **23 February 2012 (February 2012 Release)** if Approval is received from the Authority before 29 April 2011, or 28 June 2012 (June 2012 Release) if Approval is received from the Authority by 2 September 2011.

We will deliver the changes to Code Subsidiary Documents as part of the same Release as the changes to the BSC. The DTC change will be aligned with the BSC Release.

The solution would not be retrospective, as the Group believed that this would be unduly onerous on participants. The Proposed Modification would apply only to shared Import/Export sites which are newly registered or whose Metering Equipment undergoes a Material Change following approval of P266. The Group believes that business drivers exist that will encourage Parties and Exemptable Generating Plant associated with existing shared Import/Export sites to voluntarily ensure that such sites, where appropriate, comply with the P266 provisions.

Recommendation

Modification Group recommends approval of the P266 Proposed Modification.

Question 6
Do you support the implementation approach described in the consultation document?
The P266 Group invites you to provide a response to this question in Attachment C.

6 The Case for Change

This section of the document summarises the issues that the Modification Group discussed in forming their initial unanimous view that P266 would better facilitate the Applicable BSC Objectives. Further detail is provided in Attachment A.

Do the current BSC rules for allocating Reactive Power lead to anomalous charges under the CDCM?

In the first P266 Modification Group meeting (27 October 2010), the Group heard from the Proposer that the current BSC rules for allocating Reactive Power flows to Metering Systems continue to lead to spurious DUoS charges, despite the introduction of the CDCM[2].

The Group spent some time discussing the reasons for this. They concluded that the current drafting of BSC Section K does not allow the provision of appropriate Reactive Power data to Distributors, which in turn prevents Distributors from satisfactorily implementing the requirements of the CDCM (i.e. workarounds can partially meet the CDCM requirements, but do not fulfil the intent of the CDCM). The Group agreed that amending Section K (as detailed in P266 solution) removes the inconsistency between the BSC and the CDCM, and would resolve the issue of spurious DUoS charges.

The inconsistency currently exists as the CDCM states:

- Charges for the Import Metering System can only be based on Reactive Power data for Settlement Periods where Active Import occurred[3]; and
- Charges for the Export Metering System can only be based on Reactive Power data for Settlement Periods where Active Export occurred[4].

For example, paragraph 158 states that, for Import Capacity charges, "only kVArh Import and kVArh Export values occurring at times of kWh Import are used." The Group believe this is an explicit prohibition on allocating reactive power in periods of kWh Export to the Import Metering System for purposes of capacity charging. So, if Reactive Power units in periods of kWh Export are to be used in capacity charging at all, they must be allocated to the Export Metering System – which is what P266 proposes.

Similarly for the other three relevant paragraphs:

- Paragraph 162 requires that reactive power in periods of kWh Import must be allocated to the Import Metering System for purposes of capacity charging (if they are to be charged for at all);
- Paragraph 167 requires that reactive power in periods of kWh Export must be allocated to the Export Metering System for purposes of reactive power charging (if they are to be charged for at all); and
- Paragraph 171 requires that reactive power in periods of kWh Import must be allocated to the Import Metering System for purposes of reactive power charging (if they are to be charged for at all)

In each of these cases, the CDCM requires the same allocation of Reactive Power as that prescribed by Modification Proposal P266. However, the current BSC rules do not support these requirements. Instead they allocate all Reactive Power data to the Import Metering

[2] The CDCM is Schedule 16 of the Distribution Connection and Use of System Agreement (DCUSA), which is published on the DCUSA website.
[3] This bullet is describing paragraphs 158 and 167 of the CDCM.
[4] This bullet is describing paragraphs 162 and 171 of the CDCM.

System, regardless of whether Active Import or Active Export occurred in that Settlement Period.

In order to meet their licence obligation to implement the CDCM, Distributors have had to find workarounds to this issue, which, in the Proposer's view' are leading to the spurious DUoS charges. The Group identified two work arounds that are being used:

Work around 1 – Reallocate data to Export Metering System:

Some Distributors use Reactive Power data for times of generation (i.e. Settlement Periods with Active Export but no Active Import) to calculate charges for the Export Metering System, even though it was provided to them on the Import Metering System.

Work around 2 – Default Rules:

Other Distributors use default rules (i.e. assume a power factor of 0.95) when no Reactive Power data is allocated to the Export Metering System. Given that the BSC (and current industry practice) do not allow Reactive Power data to be allocated to the Export Metering System, this means in effect that all Reactive Power charges for Export Metering Systems are calculated on default data rather than actual data (even when actual Reactive Power data is available to the Supplier).

The Modification Group believed that there were issues with both of these work arounds:

- Distributors who implement work around 1 are not able to charge for Reactive Power units in Settlement Periods that have both Active Import and Active Export, which potentially leads to non-cost reflective charges. In addition, work around 1 uses data from one Metering System to calculate charges for another Metering System (which may in some cases have been registered by a different Supplier). A number of Modification Group members felt that this was unsatisfactory, in that it prevented Suppliers from validating their charges, and may be inconsistent with the requirements of the DCUSA
- Work around 2 always uses default data (rather than actual meter readings) to calculate Reactive Power charges for the Export Metering System. Also, Reactive Power data for Settlement Periods that have both Active Import and Active Export is used to calculate Reactive Power and Capacity charges for the Import Metering System (leading to potential over-charging)

The following table summarises how Reactive Power charges are calculated under each work around:

	Settlement Periods with Active Import only (i.e. AE = 0)	Settlement Periods with Active Export only (i.e. AI = 0)	Settlement Periods with Active Import and Active Export
Work around 1	Reactive Power units charged to Import Metering System. (no charging issues)	Reactive Power units charged to Export Metering System. (no charging issues)	Reactive Power units not charged. (misallocation and **undercharging** may occur)
Work around 2	Reactive Power units charged to Import Metering System. (no charging issues)	Reactive Power units are not charged (because calculated using a default 0.95 power factor). (**overcharging** or **undercharging** on Capacity Charges may occur)	Reactive Power units charged to Import Metering System. (**overcharging** or **undercharging** on Reactive Power and Capacity Charges may occur)
Proposed P266 Solution	Reactive Power units charged to Import Metering System. (Total charge is cost reflective)	Reactive Power units charged to Export Metering System. (Total charge is cost reflective)	Reactive Power units charged to Import Metering System at times of Active Import, and Export Metering System at times of Active Export. (Total charge is cost reflective)

In summary, the CDCM requires that DUoS charges for Export Metering Systems are based on data from Settlement Periods where Export occurred. However, BSC rules (under Section K) do not separate Import and Export Reactive Power data, this prevents Distributors from receiving the metered data they would need to implement the CDCM requirement in a satisfactory way. The result is Distributors are forced into workarounds that lead to what many regard as spurious DUoS charges.

In addition, the rules for allocating Reactive Power flows in BSC Section K are not only inconsistent with the CDCM, but are also inconsistent with BSC Section L5.2.4, which requires that Suppliers should provide Distributors with the metering data required to calculate charges.

The Group believe that the P266 solution would remove the inconsistency between the BSC and the CDCM, facilitate the satisfactory implementation of the CDCM by removing the workarounds that are causing spurious DUoS charges, and allow Suppliers to fulfil their obligations under the DCUSA and BSC Section L5.2.4 by providing Distributors with data for charging purposes.

Impact of P266 on Different Types of Customer

The Modification Group spent some time discussing what analysis should be carried out to establish the impact of P266 on different types of customer. The initial conclusion of the Group, which included Ofgem representation, is that it is not necessary to analyse data

from a sample of actual customers under P266, but that a theoretical analysis of the impact on different customer types would be appropriate and sufficient. This is not expected to change, but the Group will give this matter further consideration when discussing the P266 consultation responses and their final views on P266.

In discussing these issues, the Group was mindful that P266 is based upon previous Modification Proposal P224. The CDCM did not exist when P224 was raised. As such one of the areas of debate under P224 was whether, in principle, it was appropriate for Reactive Power data from Settlement Periods where Export occurred to be assigned to Export Metering Systems. The P224 Group undertook data analysis to see if it supported their view that this was the appropriate method. Ultimately P224 was rejected by Ofgem; part of the reason being is that a 'very small' sample of sites had been used in the analysis[5].

In the time between the P224 rejection and the raising of P266, the CDCM has been drafted, approved and implemented. As noted above, the CDCM contains the principle (and relevant requirements) that it is appropriate for Reactive Power flows at times of Export to be assigned to the Export Metering System. Since this principle has been enshrined in the CDCM, it is no longer appropriate for a Group under the BSC to consider it, and any discussion on the appropriateness of the underlying principle should be progressed through the CDCM change process (i.e. DCMF and DCUSA), not the BSC process.

When P266 was raised, both the Panel and ELEXON were keen to ensure that Ofgem did not reject P266 on similar grounds to P224 i.e. that there was not sufficient sample size in the analysis that was conducted. As such the Panel asked the P266 Group to repeat the P224 analysis, but using a suitable number of sites. What was not considered at the time was that, as noted above, the appropriateness of the underlying principle is no longer a BSC issue.

The P266 Modification Group has therefore decided that analysis of data from specific customers is not needed to support the progression of this Modification. However, in order to ensure that Ofgem has sufficient information on which to make a decision, the Group concluded that it would be appropriate to analyse the impact of the P266 solution for a number of hypothetical customer scenarios. This analysis was intended to illustrate the impact on charges of moving from the status quo to P266 (across all shared sites and for individual site types).

Scenarios developed

ELEXON agreed to develop the scenarios and provide a high level summary of the impacted sites categorised in terms of:

- whether their generation capacity is:
    a) significantly larger than their demand;
    b) of a comparable size to their demand; or
    c) significantly smaller than their demand;
- whether or not their demand creates significant Reactive Power flows i.e. demand power factor is:
    a) close to 1.0; or
    b) not close to 1.0;
- whether or not their generation creates significant Reactive Power flows i.e. generation power factor is:
    a) close to 1.0; or
    b) not close to 1.0.

[5] You can find a copy of the Ofgem Decision letter for P224 here.

The Group noted that Ofgem believed that the categorization would help them to better understand the impacts on charging. The Modification Group agreed that ELEXON should undertake this initial analysis work, which takes the form of a summary document accompanied by a spreadsheet model (see Section 1 of Attachment A and Attachment B) that calculates Reactive Power and Capacity charges for twelve (hypothetical but realistic) customers.

Possible Issues where Two Customers Share a Single Distribution Connection

The Group had its third meeting on 14th December 2010, via teleconference, to discuss the results of the analysis. Based on the analysis carried out, the Group concluded that P266 would give a more appropriate allocation of Reactive Power (and hence enable more appropriate Reactive Power and Capacity charges) than the current baseline. In particular:

- It would allow cost-reflective charges to be calculated for Settlement Periods with both Active Import and Active Export (unlike either work around 1 or work around 2 under the current baseline); and
- It would address other issues with the current workarounds i.e. the use of data provided by one Supplier to calculate charges for another Supplier (under work around 1), and the use of default data in place of actual metered data (under workaround 2)

However, the Ofgem representative then posed the question of whether P266 could lead to misallocation of charges between a generator and a demand customer (if it were possible for these two parties to share a single connection to the distribution system).

Is it Possible for Two Legal Entities to Share a Single Connection?

The Modification Group unanimously agreed that Distribution System Operators can only enter into a connection agreement with a single legal entity for a given connection (even where the Import and Export at the site are traded separately, through different Suppliers). However, the Group were not unanimously agreed on whether it was possible (at least in principle) for the connecting party to enter into an agreement with a third party (e.g. an on-site generator) allowing them to contract with a Supplier (so that the Import Supplier and Export Supplier have different customers, one of whom pays Import charges, and the other Export charges). Some members of the Group believed that there was nothing to prevent this, while others argued that such an arrangement was not envisaged under industry Licences or Codes, and could not arise.

Question 7
Do you believe the import bill and the export bill can be paid by different legal entities?
The P266 Group invites you to provide a response to this question in Attachment C.

If the Situation Can Arise, Are P266 Charges Appropriate?

The Modification Group did not reach a unanimous view on whether the allocation of Reactive Power required by P266 would remain appropriate if the situation did arise where different parties are charged (by their respective Suppliers) for Import Charges and Export Charges.

The potential concern (as raised in the P224 decision letter) is that one of the parties might be allocated (and charged for) Reactive Power flows caused by the other Party. For

example, if the site was Exporting Active Power, the generator party might be charged for Reactive Power caused by the demand.

A majority of the Modification Group believed that, even if this situation did arise, the allocation of Reactive Power required by P266 would remain appropriate. By entering into an agreement to share the single connection to the Distribution System, the parties must accept responsibility to manage and take responsibility for the interaction of demand and generation. Such an agreement could (if the parties so wished) include provisions for the demand customer to reimburse the generator for any Export Reactive Power charges attributable to demand (or vice versa).

The Group noted that other options open to the demand and generation customer would include:

- Arranging for the demand customer and generator to have separate connections to the Distribution System; or
- Treating the site as a licence exempt distribution system, and contracting with a Licensed Distributor to provide registration services. This allows the customer and the generator to have separate Metering Systems without needing separate connections to the Distribution System.

Question 8
Under what circumstances will billing as per P266 result in inappropriate charges for separate legal entities at a shared site?
The P266 Group invites you to provide a response to this question in Attachment C.

Question 9
How often such circumstances are likely to arise (now and in the future)?
The P266 Group invites you to provide a response to this question in Attachment C.

Question 10
Do you believe that different metering arrangements might give more appropriate charges in these circumstances?
The P266 Group invites you to provide a response to this question in Attachment C.

Question 11
Are you aware of other options to mitigate any inappropriate charges exist and whether these might be more appropriate?
The P266 Group invites you to provide a response to this question in Attachment C.

Group's initial views against objectives

The initial **UNANIMOUS** view of the Modification Group was that the Proposed Modification **WOULD** better facilitate the achievement of Applicable BSC Objectives (b), (c) and (d) when compared to the current Code baseline, for the following reasons:

Applicable BSC Objective (b)

- Levying accurate and correctly targeted charges relating to Reactive Power tends to have a positive impact on the operation of the Transmission System, as

appropriate cost signals are sent to Parties which encourages them to consider the most economic manner of operation;

- If it is in Parties' economic interest to reduce the amount of Reactive Power they cause, this will tend to reduce the amount of Reactive Power on the Transmission System, which will reduce the actions National Grid is required to take to compensate for Reactive Power.

Applicable BSC Objective (c)

- Reactive Power would be allocated more appropriately and accurately to the Party actually responsible for them (or the MSID they should logically be assigned to), and therefore DUoS charges relating to Reactive Power will be more accurate and targeted correctly;
- More accurate DUoS charges relating to Reactive Power, and more correct targeting of charges to Parties actually responsible for Reactive Power flows, will facilitate competition;
- More appropriate allocation and metering of Reactive Power would facilitate potential creation of a competitive market in trading Reactive Power volumes;
- More appropriate allocation and metering of Reactive Power would facilitate a market for ancillary services for Exemptable Generating Plant, removing a potential barrier to the creation of new plant if Suppliers were reluctant to provide services due to inflated DUoS bills caused by inappropriate allocation of Reactive Power;
- The additional, more accurate data available would allow LDSOs not currently charging for Reactive Power to do so, and would facilitate competition in Distribution System operation to the benefit of Generators and Suppliers, thereby promoting competition among these participants and encouraging entry into the market; and
- Facilitate competition between Import Suppliers to Exemptable Generating Plant, as currently these plant are potentially restricted in their ability to switch Import Supplier due to reluctance by Suppliers to risk exposure to inflated DUoS bills.

Applicable BSC Objective (d)

- Provide consistency between BSC and CDCM

The Group agreed that the Proposed Modification would have a neutral impact on Applicable BSC Objectives (a).

Question 12
Would the Proposed Modification P266 help to achieve the Applicable BSC Objectives?
The P266 Group invites you to provide a response to this question in Attachment C.

Question 13
Do you have any further comments on P266?
The P266 Group invites you to provide a response to this question in Attachment C.

7 Further Information

More information is available in:

Attachment **A**: Additional Information

This information includes:

- Summary of Group's view
- Modification Group membership
- Terms of Reference

Attachment **B**: P266 Model

Attachment **C**: Assessment Consultation Questions

Attachment **D**: Proposed Legal Text