

## P224 Report Phase Consultation Responses

Consultation Issued on 18 August 2008

Representations were received from the following parties

No	Company	File number	No BSC Parties Represented	No Non-Parties Represented
1.	Western Power Distribution	P224_dMR_01	2	0
2.	Siemens Metering Services	P224_dMR_02	1	0
3.	IMServ Europe Ltd	P224_dMR_03	3	0
4.	CE Electric	P224_dMR_04	2	0
5.	SAIC Ltd (for and on behalf of ScottishPower)	P224_dMR_05	6	0
6.	RWE Npower	P224_dMR_06	10	0
7.	Scottish & Southern Energy plc	P224_dMR_07	9	1
8.	Electricity North West Ltd	P224_dMR_08	1	0
9.	TMA Data Management Ltd	P224_dMR_09	0	3
10.	Association of Meter Operators	P224_dMR_10	0	1
11.	British Energy	P224_dMR_11	5	0
12.	E.ON UK Energy Services Limited	P224_dMR_12	0	1
13.	E.ON UK	224_dMR_13	4	0

**Question 1: Do you agree with the Panel's provisional recommendation to the Authority contained in the draft Modification Report that Proposed Modification P224 should be made?**

### Summary

Yes	No	Neutral/Other
10	3	-

### Responses

Respondent	Response	Rationale
<b>Western Power Distribution</b>	Yes	We consider that this modification will send appropriate cost messages to parties causing reactive power flows and will tend to reduce those flows that have a negative impact on the system. It will potentially reduce barriers to the installation of new generating plant and avoid the need for workarounds by distributors and suppliers.
<b>Siemens Metering Services</b>	Yes	Believe it will give a better definition of the reactive power related charging, but will require some discussion on the formulae used in the actual calculations
<b>IMServ Europe Ltd</b>	No	Is there any need for change? - Under the current arrangements the Distributor gets both the import and export sets of data. This gives them visibility of the four channels of data. Currently the Distributor can not differentiate between the RI & RE at the time of import or export. BUT for most of the time the site will be importing OR exporting for the full 30mins, the difficulty only arises when it does both in a 30min period. It would seem that the Distributor should be able to allocate the RI/RE to the respective supplier based on the active energy flow in the 30min period. This solution may mean EFFORT for a Distributor but means that they can do it on the sites of concern, using existing information, and without further market impact. Currently the export MPAN supplier does not get to see the RI/RE data to validate the Distributors calculation, but adding that data would be a minor change.
<b>CE Electric</b>	Yes	In future this change should assist with our reactive power charging by specifically assisting with implementation of the long term charging methodology when determined by the authority.
<b>SAIC Ltd (for and on behalf of ScottishPower)</b>	Yes	We agree with the Panel's provisional assessment that the proposed modification should be made. As far as allocating reactive energy charges there is a proven issue in how LDSOs assign these charges to such an extent that a number have stated they do not charge for it while other LDSOs inaccurately assign the charge to the import MPAN leading to excessive charges being levied from the incorrect Supplier. P224 will address this issue and lead to more accurate charges being levied on both the Import and Export MPAN.
<b>RWE npower</b>	Yes	We agree with the Panel's provisional recommendation to the Authority that Proposed Modification P224 should be made. P224 will better facilitate the achievement of Applicable BSC Objectives (b) and (c) when compared to the current baseline for the following reasons: <ul style="list-style-type: none"> <li>Parties will have more suitable cost signals against which to measure the most economic manner of operation, and any investment by Parties to reduce Reactive Power will feed through benefits to the operation of the transmission system – Objective (b);</li> <li>Rectifying inappropriate allocation of Reactive Power and directing accurate Reactive Power charges to the Party responsible for the associated flow of Active Power will give greater transparency in DUoS charging and facilitate competition</li> </ul>

Respondent	Response	Rationale
		<p>– Objective (c);</p> <p>Appropriate allocation and measurement of Reactive Power will assist the development of a competitive market in trading Reactive Power volumes – Objective (c).</p>
<b>Scottish &amp; Southern Energy plc</b>	Yes	We believe that the P224, in providing a cost reflective solution, would better achieve the Applicable BSC Objectives.
<b>Electricity North West Ltd</b>	Yes	EW agrees that the Proposed Modification will deliver an appropriate solution to the provision of reactive power data to the appropriate parties
<b>TMA Data Management Ltd</b>	Yes	The proposed modification will allow the correct allocation of reactive power to the import and export responsible parties to ensure the Distribution Use of System charges are distributed accurately
<b>Association of Meter Operators</b>	No	See Appendix 1 and Attachment A. The impact is greater than reported, and the benefit is smaller.
<b>British Energy</b>	No	<p>We are generally supportive of changes which allow electrical quantities to be accurately attributed to those responsible for them.</p> <p>However, the allocation of electrical quantities using an effectively shared meter is essentially arbitrary, and this proposal simply changes the current arbitrary rules to another arbitrary set which may achieve a benefit in conjunction with some current distribution charging methodologies, although we do not consider this to be proven because of the small sample considered.</p> <p>We think BSC Objectives would be better met and industry effort better expended in the long term on accurate real metering of quantities associated with demand and generation at source, where there is a desire to distinguish those activities, and on refining distribution charging methodologies.</p> <p>See below for further comments.</p>
<b>E.ON UK Energy Services Limited</b>	Yes	Increased Accuracy of DUoS charging would be of benefit to the industry as a whole.
<b>E.ON UK</b>	Yes	The approval of this modification will facilitate the appropriate allocation of charges of charges associated with Reactive Power. Competition in the export market should also be facilitated by sending appropriate economic signals to generators.

## Question 2: Do you agree with the Panel's provisional recommendation concerning the Implementation Date for P224?

### Summary

Yes	No	Neutral/Other
8	3	2

### Responses

Respondent	Response	Rationale
<b>Western Power Distribution</b>	Yes	Assuming a decision is made by 5 <sup>th</sup> February 2009 then November 2009 is the earliest we could implement this modification.
<b>Siemens Metering Services</b>	N/A	Feel that we cannot comment on implementation dates, as this will depend on suppliers having systems in place.
<b>IMServ Europe Ltd</b>	No	Where existing meter stocks are not P224 compliant, then costs will be incurred in either making them compliant either by replacing the meter, changing firmware, or by reprogramming the meter. In all instances a site visit is required to carry out proving. An extension to the implementation date would have the effect of allowing older meters to be replaced under a PMC program negating the need for an additional visit.
<b>CE Electric</b>	No	We feel the recent decision and specifically the timescales determined by the authority in terms of distributors long term charging methodologies could be given consideration here (April 2010) to ensure expectations of correct reactive power charging are met.
<b>SAIC Ltd (for and on behalf of ScottishPower)</b>	Yes	We agree that the implementation date is sufficient to allow all Parties affected to make the necessary changes to systems. This is particularly relevant to the LDSOs who will, though not mandated to, need to make changes to their DUoS systems. The implementation date of November 2009 or February 2010 will give the LDSOs sufficient time to implement such a fundamental change to their systems.
<b>RWE npower</b>	Yes	We agree with the Panel's provisional recommendation concerning the Implementation Date for P224. The necessary P224 changes to our systems and processes are achievable through our governance process in readiness for: a November 2009 release if an Authority decision is received on or before 5 <sup>th</sup> February 2009; a February 2010 release if an Authority decision is received after 5 <sup>th</sup> February 2009 but on or before 14 <sup>th</sup> May 2009
<b>Scottish &amp; Southern Energy plc</b>	Yes	-
<b>Electricity</b>	Yes	We accept the logic applied by the working group in deciding an

Respondent	Response	Rationale
North West Ltd		implementation date.
TMA Data Management Ltd	Yes	The timescales proposed in the Modification are adequate
Association of Meter Operators	No	See Appendix 1 and Attachment A.
British Energy	-	-
E.ON UK Energy Services Limited	Yes	Few if any changes are required to our systems & processes
E.ON UK	Yes	Although we could implement earlier if required.

**Question 3: Do you agree with the Panel's view that the legal text provided in the draft Modification Report delivers the solution agreed by the Modification Group?**

**Summary**

Yes	No	Neutral/Other
10	2	1

**Responses**

Respondent	Response	Rationale
Western Power Distribution	Yes	-
Siemens Metering Services	Yes	Agree with the inclusion of exemptions
IMServ Europe Ltd	Yes	The definition expansion provides clarification. It is not deemed to have any legal significance.
CE Electric	Yes	We feel the redline text attached is appropriate for the changes.
SAIC Ltd (for and on behalf of ScottishPower)	No	We would disagree with the 'OR' within section 1.2.7.c.i. Within the Modification Report it explicitly states that where import is less than 100kW import <u>AND</u> less than 30kW export. Whereas in the legal text an 'OR' is used. This, we believe, could lead to unexpected

Respondent	Response	Rationale
		<p>outcomes when threshold exclusions are applied using the rule which could potentially lead to systems which should be covered by P224 not being included.</p> <p>Therefore, we believe that the 'OR' should be replaced with 'AND' to reflect the method agreed by the Modification group.</p> <p>Furthermore, we would prefer to see a stated threshold in section 1.2.7.c.ii. This inclusion would remove any doubt over the threshold as agreed by the Modification Group and mirror what is in the current P224 Report document.</p>
<b>RWE npower</b>	Yes	-
<b>Scottish &amp; Southern Energy plc</b>	Yes	It appears to.
<b>Electricity North West Ltd</b>	Yes	-
<b>TMA Data Management Ltd</b>	Yes	-
<b>Association of Meter Operators</b>	Yes/no	Possibly. Consultation document discusses 'shared sites' but the MOD changes affect all mandatory HH sites going forward through the changes to the Meter CoPs.
<b>British Energy</b>	No	<ol style="list-style-type: none"> <li>1. We think it should be made clear in the code itself that these new measures of reactive energy should only be required in cases of shared metering where the relevant parties cannot agree how charges arising from existing measured amounts should be settled. This should be the emphasis of the legal text, rather than a fundamental redefinition of import and export.</li> <li>2. The effectiveness of the legal text is entirely dependent on changes to be made to Code Subsidiary Documents, specifically the metering Codes of Practice. Assessment analysis suggested that changes to the Codes of Practice would be intended to target only those specific cases of circuits where one party wished to take responsibility for site exports and another for import. However the proposed legal text in paragraphs K1.2.6 and 1.2.7 is written such that all parties are required to record reactive energy in a different manner to present with exceptions which are subject to Codes of Practice.</li> </ol>
<b>E.ON UK Energy Services Limited</b>	-	-

Respondent	Response	Rationale
E.ON UK	Yes	The legal text's readability would be enhanced by the addition of a hyphen in the new terms/expressions being introduced to facilitate the change wherever they occur within the legal text: Active Export-Related Reactive Energy Active Import-Related Reactive Energy

#### Question 4: Are there any further comments on P224 that you wish to make?

##### Responses

Respondent	Response	Rationale
Western Power Distribution	No	-
Siemens Metering Services	Yes	There should be national guidelines for the formulae for both DUOS use and MD.
IMServ Europe Ltd	Yes	It is not clear how the Supplier will communicate the need to reconfigure, reprogram or replace existing metering along with an implicit acceptance to bear the cost. When a MOA attends site for faults for example there is an implicit assumption that where meter replacement is required, then a like-for-like change will take place. Is this acceptable as an ongoing process as there has been no instruction from the Supplier at this point to reprogram the meter?
CE Electric	No	No not at present.
SAIC Ltd (for and on behalf of ScottishPower)	No	-
RWE npower	Yes	The part of the problem that has not been addressed, and could not be addressed in the context of the P224 working group, is whether the methodologies for reactive charges are, or remain appropriate. Reactive charges are linked to an annual service capacity (kVA) and excess kVAh above a threshold. If there is an excursion above the service capacity because reactive compensation equipment fails for a short period then does this really result in any cost to the DNO? If the reactive flow is unchanged but the active flow falls then the threshold will be breached but this will have had nothing to do with the reactive demand. P224 Improves the allocation of the reactive flow between demand and generation but it won't produce a "right" answer in all cases.  P224 will improve the transparency of what is going on. How parties react will depend as much on the financial impact as having the

Respondent	Response	Rationale
		knowledge of the physics; and that depends upon getting the DNO charging arrangements right. It might be misleading to assume that the current DNO charging methodology is either entirely appropriate or enduring.
<b>Scottish &amp; Southern Energy plc</b>	Yes	Not at this time.
<b>Electricity North West Ltd</b>	No	-
<b>TMA Data Management Ltd</b>	No	-
<b>Association of Meter Operators</b>	Yes	See Appendix 1 and Attachment A.
<b>British Energy</b>	Yes	<p>We are generally supportive of changes which allow electrical quantities to be accurately attributed to those responsible for them.</p> <p>The key element of the current rules is to allocate net active export separately from net active import, which we assume is intended to emulate the activities of generation and demand respectively. The proposal attempts to extend this emulation to reactive power, by associating all reactive quantities to the BSC Party taking responsibility for the net active flow. However, the current rules for reactive quantities are effectively (and unavoidably) arbitrary, and so are the proposed rules. In reality, the net reactive flow is not necessarily associated with the net active flow, and insufficient evidence is provided that the proposal will more accurately reflect the underlying activities.</p> <p>The issue which has led to this proposal, and the claimed benefits, arise from the interaction between distribution charging methods for reactive quantities (KVA and KVA<sub>rh</sub>), and the BSC allocation of reactive quantities at a shared meter to BSC parties. However, both of these are essentially arbitrary: the link between distribution costs associated with reactive quantities and the charges for them is unclear and could change in future, and the allocation of reactive quantities to two BSC parties sharing a meter is arbitrary as discussed above.</p> <p>We think insufficient evidence has been provided to demonstrate that the proposed modification will result generally in a more accurate allocation of underlying reactive quantities, and thence costs associated with them, between the two BSC parties taking responsibility for the corresponding majority active energy activity at a site. More evidence is required that one of the underlying activities at a site generally dominates both the</p>

Respondent	Response	Rationale
		<p>active and reactive quantities at the same time.</p> <p>Further, the claimed benefits of generally more accurate allocation is entirely dependent on distribution charging methodologies, which are subject to change.</p> <p>Attempting to use the same meter to allocate quantities attributable to different plant and equipment will inevitably create difficulties. Approved modification proposals P55, P81 &amp; P162 effectively removed previous requirements for discrete measurement of exempt generation and allowed use of shared metering for settlement purposes. Net quantities may be allocated to different BSC Parties according to essentially arbitrary rules, without reference to the detail of underlying generation and demand activities</p> <p>The allocation rules adopted for active energy are simple to understand and manage. We assume they attempt to emulate, in representing net export and net import, the activities of generation and demand. However, the associated rules for reactive energy are essentially arbitrary, as are the alternative rules proposed by this modification. In cases where one of the underlying activities dominates the other in both active <b>and</b> reactive power <b>at the same time</b>, the proposed rules may be more accurate in reflecting the underlying generation and demand activities. However, this will not always be the case, now or in the future, and little evidence is provided to support the belief that overall accuracy will be improved. The proposal could have the effect of simply shifting the allocation arbitrarily from one BSC Party to another without reference to the underlying activities. This is particularly likely when the generation and demand activities are of similar size.</p> <p>The fundamental issue which has led to this proposal appears to be the interaction between:</p> <ul style="list-style-type: none"> <li>a. Inability to accurately attribute reactive power related quantities to underlying demand and generation where meter is shared;</li> <li>b. Distribution charges for reactive power related quantities, which appear to include some arbitrary assumptions.</li> </ul> <p>This apparently causes some registrants of import at "shared" sites to face distribution costs which would be largely avoided altogether if the reactive quantities were instead allocated to the "export" registrant.</p> <p>We think distribution charging issues associated with economising on metering at a site should be dealt with at source, either by installing metering which allows electrical quantities to be definitively distinguished between those wishing to take responsibility for the relevant activities, by changes to distribution charging arrangements for shared meter sites, or</p>

Respondent	Response	Rationale
		by agreement between the party at the site and the BSC parties sharing the flows at that site.
<b>E.ON UK Energy Services Limited</b>	No	-
<b>E.ON UK</b>	No	-

## Appendix 1: P224 – Reactive Power Measurement, AMO response

### 1.1 Purpose

This document provides a response to the BSC Modification P224 - 'Reactive Power Flows Associated with Exemptable Generating Plant'.

Clearly the AMO supports accurate and meaningful metering. However the industry is traditionally reluctant to see change without a clear requirement. Whilst the members of the AMO are keen for other opportunities for income we recognise that our customers (both suppliers, generators and users) are reluctant to pay for change unless the requirement is clear.

The AMO Consultant has fed into ELEXON comments to the previous MOD on reactive energy (which was closed) and fed in similar comments when this MOD was initiated. However, it is fair to say that this is a complex subject and gaining a good understanding of all the impacts is not straight ward.

This document has been prepared by the AMO Consultant in discussion with various members. Time, and resource have been limited, so it has not been possible to seek the views of all members to this response, therefore does not necessarily represent the views of any or all members.

### 1.2 Summary

The title of the MOD indicates the original intention, however the scope has extended to affect all Half Hourly (HH) metering systems.

The requirement is to be able to invoice reactive energy correctly for Distribution Use of System charges. This response contends that that is already possible to a much greater accuracy that the MOD acknowledges.

This response does support a smaller change to give the Party responsible for the export active energy visibility of the reactive energy.

This response also suggests that the industry agree a standard method of calculating kVA Maximum Demand (MD), and kVA<sub>rh</sub> charges. Both for import sites, and for import/export sites.

It has been difficult, in the time available, to get all of the issues clearly communicated in this document, but hopefully there will be the opportunity at a future workshop.

### 1.3 Numbers

Like all changes this change needs to be considered against the impact (cost) of implementation. To give a scale of the problem the number of HH metering systems traded in Settlement<sup>1</sup> is:

Metered over 100kW:	108,522
Metered below 100kW:	2,969
Metered Export:	1,596 (1.4% of HH metering systems)

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<sup>1</sup> Figures from ELEXON for SF 27 Jul 08

It should be noted that the 'below 100kW' is probably under recorded as there are currently limited benefits for suppliers to differentiate between 'below 100kW' and 'over 100kW'.

In practice the actual number of installed HH metering systems are higher with many of them trading NHH. In the five years from Jan 2009 all existing PC5-8 customers will have HH capable meters installed, ELEXON estimate there to be an additional 170,000 HH capable meters added to the market. The metering systems between 72kW and 100kW, and all those with CTs will need a CoP5 meter. Below 72kW (whole current) could use a CoP10 meter, if the CoP10 changes are approved within the BSC.

## **1.4 Current Meter Configurations**

### **1.4.1 CoP 1, 2 & 3**

The current configurations from CoP 1,2,3 require three or four channels of data

- a) import active
- b) export active (often configured irrespective of its need)
- c) import reactive
- d) export reactive.

These CoP metering systems also have 'check meters' at least for the active data, and in some cases for the reactive.

### **1.4.2 CoP5**

When CoP5 was introduced for the 100kW market in 1994 a 'less onerous' requirement than CoP3 was agreed which recognises the higher numbers of meters and the lower settlement impact. There is no requirement for check meters on a CoP5 metering system. The CoP5 options allowed for Distributors to inform Registrants of their needs for reactive data (basically HH reactive or a cumulative register). In practice four approaches were adopted:

- configure the meter/outstation with four channels of data (as above);
- three channels (active import, reactive import, reactive export);
- two channel (active import, reactive import); and
- one channel (active import, with a cumulative register for kVArh).

The proportions of each configuration have varied since 1994 but the variety remains. The proportions vary regionally due to different Distribution and Meter Operator influences.

Distributors have never made their requirements for reactive data clear, let alone consistent. Some require kVA MD, others require kW MD to be recorded. A consistent approach for 'non settlement' registers would be beneficial to the industry.

### **1.4.3 MOD Proposals for CoP1, 2, 3 & 5**

This MOD appears to be proposing six channels of data for all new SVA CoP1, 2, 3 and 5 metering systems would need to be configured in this way. This has two main consequences – added complexity and increased volume of data. It is unclear why the requirements only apply to SVA and not CVA where similar issues may apply.

#### 1.4.4 CoP 6 & 7

Due to the lack of use or interest there is a reasonable argument to remove

### 1.5 *Threshold*

The MOD indicates that this requirement is for all HH import/export metering systems, whatever the size. The comments above indicate some of the impacts on CoP5 metering systems (of which there are already over 100,000). The requirement is also suggested for CoP10. CoP10 is for whole current meters, which in practice limits their use to below 72kW. CoP10 is hoped to be a 'cheaper' meter, but adding this requirement is likely to be costly to the industry.

The AMO is therefore agrees with the consultation document that suggests not making this MOD affect CoP10. However is very concerned about the extra impact on CoP5 metering systems.

The AMO is interested that it is not intended to modify the requirements for CVA metering systems, some of which may be affected in exactly the same way as SVA metering systems, but with much more significant consumption/revenue. This will also introduce a technical difference between CoP requirements (and therefore metering system arrangements) in the CVA & SVA markets. This will add to complexity for metering installations when they move between CVA & SVA – albeit a relatively infrequent. It will also add to complexity to specify, install and audit (TAA) the different metering systems.

### 1.6 *Meter Availability & Testing to BSCP601*

ELEXON have sought to identify if there are meters available on the market meters which can support for this change:

“The Mods Group asked us to look into the availability of Meters that were capable of separately recording RI and RE when actively importing and actively exporting and I contacted three of the main manufacturers who produce CoP compliant (latest versions) Meters. This information was fed back to the Mod Group.

ELEXON had made enquiries with three manufacturers about whether their Meters were capable of separately recording Reactive Energy when importing and exporting Active Energy. The answer we got was yes for two of them (one CoP1, 2, 3 & 5 and one CoP3 & 5 compliant Meter) and yes, but with a firmware upgrade, for another (a CoP3 and 5 compliant Meter). The latter manufacturer suggested that a firmware upgrade to enable their Meter to separately record Reactive Energy was possible remotely but could be catastrophic for the Meter if the comms failed (i.e. it would lose its personality).”

So the answer given is that there are some meter available on the market. Although the following points need to be considered:

1. Manufacturers will always indicate that their meters are compliant, however as suggested they may need to make changes to firmware. The more complex (and bespoke) the metering requirement in GB becomes the more limited is the market, limiting the entry of new manufacturers.
2. Changing the Meter CoPs as proposed will require all the meters/outstations to be approved to the new version of the CoP via the BSCP601 approval process. This involves cost for meter/outstation manufacturers. If certain meter/outstations cannot do this change then they will not be able to be sold in the market and used for new installations. This may limit the ranges of meter/outstations available on the market, which may increase meter/outstation costs to Meter Operators/Suppliers/Customers.

3. As a result of changing the Metering CoPs meters recovered from other metering locations will not be able to be re-used at another location. This will have cost implications ("stranding") for meter owners (e.g. Meter Operators and customers).
4. When a meter/outstation has its software upgraded it is likely that this will only be done at site, or in workshop – the risk of it going wrong is too high.
5. As part of the re-approval of meter types the CoP requirements for outstation memory will need to be retesting against the extra storage requirements. Although this is not thought to be a significant impact on newer models which have sizable memory. The BSC requirement of 20 days has generally been over provided for by manufacturers, giving some slack.

These costs/impacts do not appear to have been captured in the MOD Impact Assessment.

The draft documents do not include red lined versions of the Metering CoPs, so it will be interesting to see how they are worded to impact the SVA market, and not CVA market.

### ***1.7 Commissioning & Proving tests***

Where an existing meter/outstation may be capable of reconfiguration it will require re-commissioning and a new proving test. This will involve a site visit and new records. The MO (and HHDC) will probably expect to be paid for any early changes of metering.

### ***1.8 J0103 - Measurement Quantity Id***

The consultation document indicates that there is no need to add two further Measurement Quantities. In principle this may be correct, however this will increase the opportunity for additional data errors where the incorrect reactive data is sent the wrong way (see 1.9). The BSC will now define the six channels of data, these are different measured items, they should have different Measurement Quantities defined. J0103 is a BSC owned data item defined in MDD. Part of the MOD should be to add these extra items. As the change is not retrospective the different metering arrangements, and therefore reactive values, will continue into the future. By not adding new Measurement Quantity IDs the MO, HHDC, Supplier & Distributor may be uncertain of the quantities received.

It should be noted that Active Import and Active Export have always had different Measurement Quantities.

The default settings of the existing meters on the market, of different manufacturers, may result in different reactive data being recorded. The meter manufacturers have different views of the "standard" reactive values. To meet the BSC requirements Meter Operators have to ensure they configure the meters using 'custom' settings. If the MOD is implemented it will be appropriate to provide further explicit guidance within the Meter CoPs on which mode, in which quadrant the data is stored in which register.

### ***1.9 Complexity***

The MOD consultation proposes the MO sending the Meter Technical Details (MTD) identifying the three channels of information to the HHDC for each MPAN – that will work, it works now. In practice the MO has to send details of the other three channels as 'unused' in both MPANs. There also will be check meters, which can double the number of channels. The HHDC may then have to [manually] put the two MPANs together again so that they can correctly interrogate the outstation, then 'map' the relevant channels to the relevant MPAN. This can go wrong - and has gone wrong - by errors by MOs and HHDCs with 'check' meters, effectively doubling the data. SVG has acknowledged this risk. Add these extra channels may increase risks of active and reactive data errors across all metering systems. Of course, when a problem is

identified in the settlement window these can be corrected, however these corrections can lead to customer re-billing and the associated customer service issues. (see comments on Measurement Quantities).

The MOD does not consider what should happen in the 98% of cases with the reactive values associated with export active consumption where there is only an import metering system registered (e.g. the export kWh 'spill'). The HHDC will need to collect the data, effectively discard it, or should it, as now, be summed with the reactive import data?

### 1.10 Volume of Data

Adding channels adds to quantity of data, this has the following impacts:

- Data retrieval time/cost increase (HHDC)
- Data validation becomes longer, more complex (HHDC)
- DTN data transmission costs/time increase (HHDC)
- DTN file data processing/validation (Distributor & Supplier)
- Data Storage increases (HHDC, Distributor & Supplier)

The overall number of metering systems is increasing so all new metering systems will have these impacts. As existing metering systems are replaced they will progressively have an impact. Much of the data will be zero 'A' data, which in practice is of little value!

Increasing the volume of data recorded/distributed will increase the queries. These queries will increase the staffing requirements across all parties to validate, query, investigate and respond. This will increase the 'cost to serve' on many parties.

### 1.11 DUoS Charging – kVA Maximum Demand

The DUoS calculation needs to be explicitly and consistently defined to ensure that the MOD, or any alternative, can be assured to produce to the desired result. Not least of which so that Customers, Ofgem, Suppliers and Distributors all have a common view of the charges.

The "DUoS examples" provided to the Panel, and published DUoS charging statements, indicate Distributors using different methods of calculating kVA maximum demands:

$$\text{Method A: } \quad \text{kVA MD} = \sqrt{AI^2 + RI^2} \quad \text{and} \quad \text{kVA MD} = \sqrt{AE^2 + RE^2}$$

$$\text{Method B: } \quad \text{kVA MD} = \sqrt{AI^2 + (RI+RE)^2} \quad \text{and} \quad \text{kVA MD} = \sqrt{AE^2 + (RI+RE)^2}$$

Two different approaches lead to two different answers.

The *method B* sums the same reactive data twice therefore impacting both the import & export supplier, this gives a result even when there is no import or export active consumption in the relevant half hour. Adding an "If AE=0 then kVA(export) =0" (and similar for import) gives a more meaningful result.

A third approach would be:

$$\text{Method C: } \quad \text{kVA MD} = \sqrt{AI^2 + (RI-RE)^2} \quad \text{and} \quad \text{kVA MD} = \sqrt{AE^2 + (RI-RE)^2}$$

If the result within the inner brackets is negative, then the negative sign is lost when the result is squared, so it is taking the *difference* between the two reactive values within the half hour. There is an argument that this is the most appropriate calculation, where the active consumption is wholly import or wholly export

in the half hour, then the kVA MD is wholly attributable to that party. ***Distributors, Suppliers, Ofgem and Customers need to agree a consistent method of calculating kVA MD.***

From review of the examples, and consideration of the calculations, the kVA MD anomalies occur in the half hours when there is *both* import & export active energy recorded. For example where there has been a small import active consumption and a high export active consumption with a high reactive values recorded. Any of the above calculation will result in a misleading kVA MD.

Practically, the peak kVA MD for import and export will occur when the site is either *wholly* importing or wholly exporting for a full half hour period. It is the peak half hour kVA MD value in the billing month which triggers changes to Authorised Supply Capacities. The current data can calculate a meaningful MD value when the site is wholly import or export, which based on the examples is the vast majority of time for the vast majority of cases. ***The proposed MOD will not change the values calculated in this way.***

Unfortunately time limits the ability to prepare vector diagrams to illustrate the effect of the three methods of calculating kVA MD. Similarly there has not been time to compare the several alternatives to assess the most appropriate using the example data. Although it is proposed that *method C* and suppressing the kVA MD in half hours where there is both active import and export will give the most appropriate result.

In several of the "DUoS examples" I have added a row **highlighted in yellow** to illustrate a slightly different calculation which could be achieved in a Distributors billing system - *using the current metered data* - and give either the desired or at least a meaningful result. The values **highlighted in green** on the "Dist'r C – example 4" tab are probably the most appropriate. The tabs which only had import or export consumption have been deleted (to save space) as the examples which are importing and exporting are more difficult to resolve. ***Adopting a more appropriate kVA MD calculation in DUoS Systems can resolve the current calculated anomalies.***

## **1.12 DUoS Charging – kVArh**

The proposed MOD *will* change the relevant values of the kVArh values for the current methods. The change will only occur in the HH where there is both import and export active consumption. As the vast majority of cases on the DUoS examples spreadsheet are wholly import or exporting over the billing month this will only make a minor difference to the calculation.

In a *quick* review of *some* DUoS charging statements. Neither E.ON or WPD charge kVArh for export kVArh. ENW charges import and export kVArh charges, in applying the formula to the "Dist'r C – example 4", the result is heavily 'no charge'. The ENW DUoS approach uses the reactive kVArh in the HH where there is import and export in the calculation for the import *and* the export supplier, this is probably inappropriate, although in many cases the calculation should remain as 'no charge' when summed over a month. Should also note that the ENA summary DUoS spreadsheet does not show the ENW export kVArh charging element.

***Based on this brief review although the MOD would change the figures for the calculation, the overall charging result may not change for most customers due to the slight calculation changes not breaching thresholds triggering charges.*** It would be appropriate to validate this view by reviewing against more examples.

If the MOD was introduced these charges would no longer be based on averages over a half hour but on demands/consumptions *within* a half hour. This is a significant conceptual change from billing on half hour values to billing on peak values within a half hour. For example the kW MD is the average kW demand within the 30min period, a customer that consumes 100kW for 15 minutes and 50kW for 15mins will have a kW maximum demand within that HH of 75kW. The MOD will change this accepted approach.

### **1.13 Distributor & Supplier Data Visibility**

Distributors already have the existing four channels of data for the metering system, three associated with the active import MPAN and one with the active export MPAN. Using their own Distribution records they can 'associate' the data from each MPAN. The Distributors can already therefore apply the calculations they are proposing in the "DUoS examples"<sup>2</sup> included with the Panel papers.

If they were to apply DUoS billing using the reactive data currently not visible to the Export Supplier, then it would be appropriate to include with the export MPAN the *same* two channels of reactive data so that the Export Supplier has visibility of the same reactive data as the Import Supplier. This would not require any physical changes to metering equipment, but some adjustments to MO standing data & HHDC data and systems. It may not even need a BSC MOD, but changes to the BSCPs and/or MRA documents.

### **1.14 Conclusion**

The AMO would request that:

- 1 The MOD group consider the issues raised with the impact of the current MOD.
- 2 Clearly determine how DUoS charges (kVA MD and kVArh for import and export) should be calculated, in an 'ideal arrangement'.
- 3 Agree a consistent (and pragmatic) approach to how DUoS charges are calculated, ideally using the 'current arrangements' which are considered to already provide data to a satisfactory level of accuracy.
- 4 Then identify the differences between the 'ideal arrangement' and the 'current arrangements'. If any changes are required then these will provide the basis of any justification for change.
- 5 In the process, consider the requirement to be limited to only those metering systems requested by the Registrant for sites where both the import and export in registered in settlement (making the requirement only applicable to some 1,600 metering systems) rather than all (CoP1, 2, 3 & 5) HH metering systems.

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<sup>2</sup> <http://www.elexon.co.uk/changeimplementation/ModificationProcess/modificationdocumentation/modProposalView.aspx?propID=248>  
see Assessment Report presented to the BSC Panel, Shared sites examples.