Power Data
A S S O C I A T E S

UMSUG paper – Reactive Power

1.   Purpose

This document is seeking to initiate a change to the BSC to remove the requirement for unnecessary and erroneous reactive power calculations in the unmetered arrangements.

The BSC[1] places an obligation on Meter Administrators to determine the reactive power used by unmetered equipment. The data is not used by the industry and is therefore is a waste of effort. This paper proposes the requirement is removed from the BSC.

This paper is proposing a BSC Change Proposal (CP) is raised to remove the existing requirements from BSCP520 and potentially from the Operational Information Document (OID).

2.   BSC requirements

The BSC arrangements include requirements to support Licensed Distribution System Operators (LDSOs), aka Distributors, in calculating Distribution Use of System (DUoS) charges. This information is not required by the BSC but is included in the BSC to support the LDSOs.

The BSC520 puts obligations on parties to provide reactive data to stakeholders at the request of LDSOs for DUoS billing purposes. To facilitate provision of reactive data, whether the LDSOs actually request it or not, there are several underpinning requirements in the BSC, including:

- Charge codes – watt and var data is captured for all new unmetered equipment during unmetered approval process
- ELEXON charge code spreadsheet records & publishes the watt, VAr and VA values
- Meter Administrators maintain the charge codes watt and var data in their systems
- When Meter Administrators calculate HH data for unmetered customers they calculate kWh and kVArh (reactive lag) data for each half hour
- The half hourly kWh & kVArh data is submitted to the Half Hourly Data Collector (HHDC) who stores the data and transmits it to the respective Supplier & Distributor in DTC dataflows D0036 or D0275

The unmetered calculation of reactive data is not an accurate calculation due to:

- missing or inaccurate reactive values in the charge code spreadsheet for many items of equipment
- use of generic LED charge codes, where it has been agreed to apply a default unity power factor
- the impact of dimming (variable and CMS) which assumes the reactive value declines in the same proportion to active energy, and
- some unmetered equipment under test has a leading power factor, but the BSC does not require the accurate calculation of leading reactive data, so this is treated as a unity power factor.

In common with other electrical equipment over the past ten years the use of newer lamp types, particularly LED with electronic drivers, has replaced older lamp types using transformer ballasts. As a result, there has been a general improvement in the power factor of street furniture.

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[1] www.elexon.co.uk/bsc-and-codes/bsc-related-documents/bscps/ see BSCP520 – unmetered supplies

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3.   DCUSA requirements

The Distribution Connection and Use of System Agreement (DCUSA) sets out the methodology for determining DUoS charges in the Common Distribution Charges Methodology (CDCM). The CDCM does not, and never has, determined any DUoS reactive charges for unmetered supplies, either kVArh or supply capacity in kVA. As a result, the existing BSC requirements are adding no value, but adding additional cost, effort, unnecessary and probably misleading dataflows.

DUoS charging considerations:

➤ reactive charges are not charged for metered whole current customers

➤ unmetered customers are all whole current network connection points, so for consistency the unmetered customer should not be charged

➤ individual connection points are typically small, a few 10's of watts so neither good nor poor power factors are likely to have any engineering impact on the local distribution network

➤ the unmetered reactive calculation is already inaccurate for the reasons stated above, and

➤ the BSC only requires the calculation of the reactive data for Half Hourly unmetered customers, there is no similar requirement for Non Half Hourly unmetered customers, which is inconsistent.

The National Terms of Connection[2] for unmetered supplies already require any equipment to have power factor to be maintained as near to unity as possible and not less than 0.95 leading or 0.85 lagging through each connection point. This will not change.

4.   DCUSA view

As the BSC requirement is intended to support DUoS charging I raised the subject with the Distribution Charging Methodologies Development Group (DCMDG)[3] at the 5th July 2018 meeting. The group includes Distribution and Supplier representatives involved in determining DUoS charges through the CDCM. Ofgem also attend. The view of the group was that as there have never been reactive power charges for unmetered supplies in the CDCM and there is no expectation that any will be forthcoming, they cannot see any reason why the BSC should not remove the requirement. It is recognised that a proposed BSC CP will give a formal opportunity for BSC Parties (Supplier and Distributors) to support (or not) any change to the BSC.

The purpose of seeking the DCMDG view was to identify any impending consideration that the reactive data would be used in DUoS charging, prior to raising the issue with the BSC. The DCMDG confirmed there is no known activity which would suggest a barrier removing the requirement in the BSC.

5.   BSC Change

There are two aspects that could be changed in the BSC, which UMSUG should consider:

1   Remove the requirements in the BSC upon the Meter Administrator to calculate reactive data

2   Change the charge code application process to not test or capture in the charge code spreadsheet, and/or

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[2] www.connectionterms.org.uk

[3] www.dcusa.co.uk/Lists/DCUSA%20Calendar/DispForm.aspx?ID=2835&Source=https%3A%2F%2Fwww%2Edcusa%2Eco%2Euk%2FLists%2FCommittees%20%20Groups%20List%2FDisplayCGForm%2Easpx%3FID%3D237&ContentTypeId=0x01020027E750AFC0265645A3CB533F29B9DE0700F3667BAAA396764DBF60F04C812E5889

The first aspect is not likely to materially change any existing Equivalent Meter system but could result in future changes removing the functionality. In the short term the reactive values may be removed from the HH data flows to minimise the erroneous reactive data being circulated.

The second aspect could reduce cost for all applicants for testing of new unmetered equipment but loses the visibility of very poor power factor equipment, which could be outside the power factor limits in the National Terms of Connection. If ever there was a requirement in the future to determine the reactive values, then the data will be lacking for unmetered equipment tested from the date of change. Where the current testing identifies a poor power factor it does not prevent the issue of a charge code, although it may prompt a LDSO to consider whether an unmetered connection is appropriate.

6.   Recommendation

The UMSUG is invited to:

- **Recommend** to SVG that a BSC CP is raised to remove the BSC requirements associated with calculation of reactive data
- **Determine** whether the testing requirements within the OID for new equipment should be continued or should cease.

Tom Chevalier

13th Sept 2018

Annex - Proposed changes

BSCP520

BSCP520 has several references that could be simply changed as follows *(heading numbers may be renamed under CP1507)*:

1.2.4.4 Recording Devices

~~If requested by the LDSO, the MA shall provide details of reactive power as an output from the Equivalent Meter.~~

3.4.7   For each MSID, use the EM to determine the HH kWh consumption ~~(and kVArh if requested by the UMSO)~~ by MSID.

4.6.1 Hardware - PECU Arrays *(heading likely to be renamed under CP1507)*

~~An identical process shall occur for kVArh data.~~

4.6.3.1 Functions of a Passive Meter

(c) The Meter Administrator shall be able to add, delete and modify Charge Code and their associated circuit watts ~~and circuit Volt Amperes reactive (VArs)~~ for both full load circuit loading and dimmed load ratings as appropriate.

(f) The system shall calculate, as defined in 4.5.1, the import kWh ~~and import kVArh~~ in each half hour period in UTC for each MSID.

4.6.3.3 Functions of a Dynamic Meter using CMS Data

(d) The MA system shall calculate, by an approved method, the import kWh ~~and import kVArh~~ consumption in each half hour period in UTC for each MSID using the switching times and power level information reported in the operational event log.

4.6.4 Equivalent Meter Output File Format

Could be modified but it already has a suitable definition where no reactive data is provided for either "Kvarh-lag" or "Kvarh-lead" (sic).

Operational Information Document (OID)

Consequential changes could also be made to the OID, for example testing requirements to remove the need for reactive data, if that is the recommendation of UMSUG.