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Action:	**For Discussion**

MP085A Proposed Solution update

1. Purpose

This paper provides an update on the Proposed Solution of MP085A 'Synchronisation of smart meter voltage measurement periods'. We seek any comments the Technical Architecture and Business Architecture Sub-Committee (TABASC) may have on the Proposed Solution and legal text before carrying out the Refinement Consultation.

2. Issue

The original Smart Energy Code (SEC) Modification MP085 was split in February 2021 in order to separately address the issue for newly manufactured Devices from those already installed:

- MP085A is a Technical Specifications document change for meter Manufacturers to ensure newly manufactured Devices commence average Root Mean Square (RMS) Voltage Measurement Period readings on the hour or half past the hour (whichever occurs first); and
- MP085B is a solution for meters that are currently installed. This is still to be developed.

The expectation of Electricity Distributors during the development of the Smart Metering Equipment Technical Specification (SMETS) was that the average RMS voltage readings from smart meters would be measured across a consistent period. For example, with the default being for an average to be made across a 30-minute period starting on the hour and on the half hour as per the half hour consumption profile data. However, this was not an explicit requirement codified in the Technical Specifications.

During the Refinement Process, the Smart Energy Code Administrator and Secretariat (SECAS) obtained information from a Electricity Distributor relating to meters that do not commence average RMS voltage readings on the hour. Of the meters tested by four Network Parties, over 50% provided average RMS voltage readings that were not synchronised to the hour or half hour.

Without voltage measurements being made in a consistent way, Electricity Network Parties must either make conservative, less efficient analysis assumptions to account for the lack of data alignment or recreate synchronised data by downloading high granularity (for example minute resolution) voltage data and calculating the required data.

Without synchronised recording times it is difficult to:

- understand voltage issues on Low Voltage feeders that may be affecting more than one customer;

- identify trends or forecast future voltage issues; or
- validate power flows and voltages on network models that relate to a defined 30-minute period, and hence identify the most efficient solution.

In summary it is more difficult and less accurate to manage the Low Voltage Networks.

3. Business Case

There are two headline implications if this issue is not addressed:

- **More reinforcement action will be required** - Electricity Network Parties will either need to make conservative assumptions about network voltages which may lead to inefficient solutions being implemented. This will result in higher costs associated with network reinforcement generally and higher costs for customers looking to connect additional demand or generation to the distribution network; or
- **More Service Request traffic will be needed** - Electricity Network Parties will need to reconfigure the Average RMS Voltage Measurement Period from the default period of 30 minutes to one minute and download the high granularity data so that they can recreate synchronised data in their own systems. This will increase the voltage data related traffic on the DCC infrastructure by a factor of 30 and require Electricity Network Parties to develop systems to manage a greater volume of data than originally envisaged and to re-create the required synchronised voltage data. This is not considered to be an efficient solution.

4. Proposed Solution

The Proposed Solution is to ensure that the Average RMS Voltage Measurement Period commences on the hour or half past the hour (whichever occurs first). Any changes in duration to the Average RMS Voltage Measurement Period are to be applied from the start of the next hour or half past the hour according to the Device's clock. Users will be able to choose a measurement period from 11 pre-determined values. The maximum length will be 1,800 seconds (30 minutes), and all other values will be factors of 1,800. Please see the available values below:

Average RMS Voltage Measurement Period	
Seconds	**Minutes**
10	00:10
15	00:15
30	00:30
60	01:00
120	02:00
180	03:00
300	05:00
360	06:00
600	10:00
900	15:00
1,800	30:00

If a Electricity Distributor attempts to set the measurement period to a length outside of the above 11 values, a new Data Service Provider (DSP) validation check will be failed, resulting in the Service Request (SR) being rejected along with producing a new error code, notifying the DNO that their request has been unsuccessful.

For MP085A, this will be applied to newly manufactured Devices once the modification has been implemented.

5. DCC Preliminary Assessment

The DCC Preliminary Assessment confirmed that this modification will require changes to the DCC Systems, in particular, the DSP system. There are no changes to the Communication Service Providers' (CSPs) systems.

The DCC Preliminary Assessment states that DNOs use the SR 6.5 'Update Device Configuration (Voltage)' to set a measurement period in Electricity Smart Metering Equipment (ESME). The DSP will be required to amend the processing of SR 6.5 to introduce a new validation check to verify the value of the attribute 'Average RMS Voltage Measurement Period'. If the Average RMS Voltage Measurement Period is not a factor of 1800, then the Service Request will be rejected using a specific error code. A new error code will be introduced for this, which will require changes to the DCC User Interface Specification (DUIS) schema.

In situations where the Service Users do not use a version of DUIS that supports the new error code, the existing error code E060501 will instead be used to indicate failure. DUIS Guidance will be required for Service Users to inform them of this possible usage of E060501.

The valid values for Average RMS Voltage Measurement Periods will be finalised as part of the Impact Assessment, but are likely to be those in the table above.

The DCC Preliminary Assessment stated that the modification will cost between £100,000 to £200,000 up to the end of Pre-Integration Testing (PIT), and the DCC Impact Assessment is costed at £8,645.12.

Please note that the DCC Preliminary Assessment was carried out before MP085 was split into two separate modifications.

6. BEAMA and Working Group discussions

SECAS engaged with the British Electrotechnical and Allied Manufacturers' Association (BEAMA) to further understand the functionality of the Proposed Solution. SECAS issued a Request for Information (RFI) document in December 2020 to gain feedback from Device Manufacturers in relation to whether existing Devices currently installed can be updated to meet the Proposed Solution.

The respondents confirmed that ESME Manufacturers could implement the Proposed Solution via a firmware upgrade. The respondents stated that this is generally current behaviour and advised that if time is an important factor, it has to be recognised that the ESME, whilst synchronised, has the Communications Hub as a time reference, as the ESME is not aware of the time independently.

In terms of the complexity of the change, the respondents requested that the requirements should be further refined to specify edge case behaviours. The change complexity was categorised as medium.

BEAMA sought further clarification on edge case scenarios, to ensure that the business requirements and legal text are robust to cover all scenarios. SECAS provided the draft legal text to BEAMA to distribute to its members. The legal text was updated to incorporate the edge case scenarios.

The responses to the consultation and the amended legal text were discussed at the SEC Working Group in February 2021. It was agreed that by including the edge case scenarios in the legal text would result in all meter Manufacturers having to build Devices to the latest specifications, as opposed to only the Manufacturers whose Devices do not record average RMS voltage readings on the hour or half past the hour. The Working Group were concerned about this more complex approach as it would likely result in higher costs and Suppliers being left with non-compliant meters once specific versions of Technical Specifications have expired.

A meter Manufacturer summarised the Proposed Solution whereby the Network Party must have the data alignment, whereas all other functionalities in the BEAMA consultation are 'nice to have changes'.

Following feedback from BEAMA and the SEC Working Group, the edge cases have been reviewed and the draft legal text amended with the intent that Manufacturers whose Devices do record average RMS voltage readings on the hour or half past the hour will not need to make any changes to their designs. It is intended that the proposed legal text is shared again with BEAMA to confirm that the revised text aligns with this intent.

Recommendations

The TABASC is requested to:

- **PROVIDE** views or comments on the Proposed Solution; and
- **PROVIDE** views or comments on the legal text.

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SECAS Team

24 June 2021

Attachments:

Appendix A: MP085A Modification Report v0.5

Appendix B: MP085A draft Legal Text v0.3

Appendix C: MP085 DCC Preliminary Assessment