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DP085 ‘Synchronisation of smart meter voltage measurement periods’

Problem statement – version 0.2

About this document

This document provides a summary of this Draft Proposal, including the issue or problem identified, the impacts this is having, and the context of this issue within the Smart Energy Code (SEC).

Proposer

This Draft Proposal has been raised by Alan Creighton from Northern Powergrid.

What is the issue or problem identified?

What is average RMS voltage and what is it used for?

The Root Mean Square (RMS) voltage value of an Alternating Current circuit represents an equivalent voltage of a Direct Current circuit. Electricity Network Parties use smart meter average RMS voltage and average consumption data to monitor the performance of distribution networks and identify any problems.

Once there is data available in reasonable quantities from smart meters Electricity Network Parties plan to use this data to develop the most efficient solution to any identified problem. The uptake in Low Carbon Technologies, particularly Electric Vehicles and Distributed Generation is expected to cause an increase in the number of power flow and voltage issues in distribution networks. Voltage and consumption data from smart meters will help manage these issues efficiently in the future.

What is the issue?

The expectation of Electricity Network Parties during the development of the smart meter technical specification 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. This is not an explicit requirement codified in the Smart Metering Equipment Technical Specifications (SMETS) or the Great Britain Companion Specification (GBCS).

Whilst some electricity meter manufacturers' meters work in this way, other manufacturers' meters do not. Without voltage measurements being made in a consistent way, Electricity Network Parties must either (i) make conservative, less efficient analysis assumptions to account for the lack of data alignment or (ii) recreate synchronised data by downloading high granularity (for example minute resolution) data and calculating the required data.

How does this issue relate to the SEC?

The Proposer has stated that there will need to be amendments to SMETS (SEC Schedule 9) and GBCS (SEC Schedule 8). The issue lies with the requirements for specifying the timings when the RMS voltage readings take place. Currently it is not stipulated in either document.

What is the impact this is having?

What is the impact of doing nothing?

Average RMS voltage readings that relate to random 30-minute periods are helpful for identifying voltage problems at an individual customer premises. However, without synchronised recording times it will be 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 a network model relating to a defined 30-minute period, and hence identify the most efficient solution.

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

- Electricity Network Parties will either need to make conservative assumptions about network voltages which may lead to inefficient solutions being implemented; or
- 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 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. This is not considered to be an efficient solution.

What are the views of the industry?

Views of the DCC

The DCC commented that it was supportive of the proposal. It felt that this draft proposal will have no impact on DCC Systems.

Views of SEC Parties

No views of Parties were received during the Development Stage.

Views of Panel Sub-Committees

The TABASC showed an interest in the proposal and would like to be kept up to date with its progress.

The SSC commented that there are no security risks with this proposal and they are happy with it to proceed. It will not require further updates.

The Operations Group showed an interest in this proposal, however would only like to be kept up to date if the proposal is not approved for implementation.

Views of the Change Sub-Committee

A Change Sub-Committee (CSC) member pointed out that there were some synchronisation issues as a whole and it would be beneficial to look at all synchronisation issues together to explore any efficiencies in a solution to a number of problems. Another member pointed out that these would have been discussed at Technical Specification Issue Resolution Sub-committee (TSIRS). This was discussed with the Proposer and Technical Operations and it was agreed that although a valid concern, it was felt that this was a separate issue to the one defined in this proposal.