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MP230

‘Review the SLA for delivery and completion for SMETS1 firmware’

Modification Report

Version 0.7

31 January 2024



About this document

This document is a Modification Report. It sets out the background, issue, solution, impacts, costs, implementation approach and progression timetable for this modification, along with any relevant discussions, views and conclusions.

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This document also has three annexes:

- **Annex A** contains the business requirements for the solution.
- **Annex B** contains the redlined changes to the Smart Energy Code (SEC) required to deliver the Proposed Solution.
- **Annex C** contains the full responses received to the Refinement Consultation.

Contact

If you have any questions on this modification, please contact:

Mohammedanwar Sumro

020 3934 4506

mohammedanwar.sumro@gemserv.com

1. Summary

This proposal has been raised by Nick Rodgers from the Data Communications Company (DCC).

Firmware images for some Smart Metering Equipment Technical Specification (SMETS)1 Devices are significantly larger than the 750kB that the DCC System has been designed to handle. These larger images need to be broken down to send in multiple images. The DCC system can process 12,000 of these images a day. The Smart Energy Code (SEC) currently states that the Target Response Time (TRT) for processing of firmware upgrades is five days, which cannot be achieved on a large scale with these larger firmware images.

The solution clarifies that if a firmware image for a SMETS1 Device is larger than 750kB and the User wants to send a batch larger than 500 images per day, the User needs to contact the DCC through the DCC Service Desk to coordinate and agree on a delivery schedule. Once this delivery schedule is agreed, the five-day TRT will still apply from the point of sending each batch.

This modification impacts Large and Small Suppliers and the DCC with costs limited to Smart Energy Code Administrator and Secretariat (SECAS) implementation cost. This is a Self-Governance modification and is targeted for the June 2024 SEC Release.

2. Issue

What are the current arrangements?

The DCC Systems have a limit to the amount of large (>750kB) SMETS1 firmware images that can be processed without causing a degradation of System performance meaning that if a significant volume of large firmware images need to be processed, they must be spread over several days. Where a firmware image for a SMETS1 Device is larger than 750kB, it is broken down into blocks for transmission across the network. The current TRT for the DCC to complete this process is five days end to end, and the TRT currently applies whether there is one Firmware image to process or many.

Some Electricity Smart Metering Equipment (ESMEs) have a very large firmware image, in excess of 750kB, that requires being broken down into multiple images. The current processing of these images is possible at maximum capacity of 12,000 images a day. Since no further SMETS1 Devices are being installed it was believed unlikely that the whole of this Device estate would require further firmware updates. However, there have been instances where firmware upgrades have been required, for instance with the introduction of the Energy Price Cap.

What is the issue?

There is an estimated 600,000 SMETS1 Devices with these particularly large images. These Devices have a lifespan of approximately 10-15 years, during which time they may require further firmware updates. Because of the especially large image size, the DCC System cannot process them within the TRT without risks to the day-to-day traffic on the System.

What is the impact this is having?

The DCC Services, as per its licence, are managed under the Price Control arrangements, which are overseen by Ofgem and measured by the Ofgem Operational Performance Regime (OPR). If the DCC fails to meet System performance, Ofgem may determine a reduction in the baseline margin that the DCC may retain for the Regulatory Year. In addition, it could impact other Users on the DCC System.

In addition, releasing a large number of these firmware images onto the DCC System at one time, especially during peak times, may result in a reduced service for all Users.

3. Solution

Proposed Solution

The solution clarifies that if a firmware image for a SMETS1 Device is larger than 750kB and the User wants to send a batch larger than 500 images per day, the User needs to contact the DCC through the DCC Service Desk to coordinate and agree on a delivery schedule. Once this is agreed, the five-day TRT will then apply on those batches.

The proposed change to the legal text for this is placed in SEC Appendix E 'DCC User Interface Services Schedule' (UISS). The redlined changes can be found in Annex B.

Impact on consumers

There are no impacts to consumers.

4. Impacts

This section summarises the impacts that would arise from the implementation of this modification.

SEC Parties

SEC Party Categories impacted			
✓	Large Suppliers	✓	Small Suppliers
	Electricity Network Operators		Gas Network Operators
	Other SEC Parties	✓	DCC

Small and Large Suppliers will see their firmware images which are greater than 750kB be processed within the five-day TRT. Suppliers may need to make changes to internal processes to include liaising with the DCC in advance of deployment in these circumstances.

The DCC will be able to process larger firmware images within the TRT. The DCC process will be impacted as they will be required to confirm a batch size from a DCC User if the required number of upgrades is greater than 500 images and images are greater than 750kB.

SEC and subsidiary documents

The following parts of the SEC will be impacted:

- Appendix E 'DCC User Interface Services Schedule'

The changes to the SEC required to deliver the proposed solution can be found in Annex B.

Consumers

This modification will not impact consumers.

Other industry Codes

This modification will not impact other Industry Codes.

Greenhouse gas emissions

This modification will not impact greenhouse gas emissions.

5. Costs

DCC costs

There are no DCC costs to implement this modification.

SECAS costs

The estimated SECAS implementation cost to implement this as a stand-alone modification is half a day of effort, amounting to approximately £300. This cost will be reassessed when combining this modification in a scheduled SEC Release. The activities needed to be undertaken for this are:

- Updating the SEC and releasing the new version to the industry.

SEC Party costs

During the Refinement Consultation four out of five respondents confirmed that their organisation will not incur any costs with the implementation of this modification. One respondent advised there will be an additional cost due to putting firmware into batches for 12,000 images per day.

6. Implementation approach

Recommended implementation approach

SECAS is recommending an implementation date of:

- **27 June 2024** (June 2024 SEC Release) if a decision to approve is received on or before 13 June 2024; or
- **7 November 2024** (November 2024 SEC Release) if a decision to approve is received after 13 June 2024 but on or before 24 October 2024

This is a text only change and the next SEC Release that it could be included in is the June 2024 SEC Release.

Three out of five Large Suppliers supported the proposed implementation approach explaining it is seen as the only viable option with reasonable timeframes.

7. Assessment of the proposal

Sub-Committee input

SECAS has engaged with the Chairs from the Operations Group (OPSG), the Technical Architecture and Business Architecture Sub-Committee (TABASC), the Security Sub-Committee (SSC) and the Smart Metering Key Infrastructure (SMKI) Policy Management Authority (PMA) to confirm what input is required from these forums. SECAS believes the following Sub-Committees will need to provide the following input to this modification:

Sub-Committee input	
Sub-Committee	Input sought
OPSG	Input into solution options and impact on operational function and reporting
SSC	No security concerns
SMKI PMA	No input
TABASC	Review if a DCC System change the most cost-effective way to resolve this issue. Agree the upper limit of a firmware image.

Observations on the issue

Views of the Change Sub-Committee

A Change Sub-Committee (CSC) member believed the impact this issue is currently having is that the DCC is unable to allow Users to roll out firmware in the volumes Users would like to be able to. They suggested that the DCC was stopping firmware from being rolled out as its systems couldn't handle the volume and size of the updates. They believed the issue was, in fact, that the DCC was not accepting firmware delivery requests from Suppliers, rather than the impact arising from the DCC missing the TRT. The DCC confirmed that they decided to not accept firmware delivery requests when they would breach the SLA due to the pressure on the DCC System and potential to degrade the service for all Users.

OPSG Discussion

OPSG Members noted that either increased capacity should be delivered to enable DCC to meet the TRT in any circumstance, or the TRT should be extended in these specific circumstances. The OPSG recommended both options be assessed in parallel to determine which would be the more effective to implement.

Views from TABASC

Future image sizes

The likelihood of SMETS1 firmware image exceeding 750kB in the future was considered low. However, it was noted that certain situations, such as security updates, might require precedence and faster processing.

Applicability in UISS

A TABASC member emphasised that the 750kB threshold should apply in SEC Appendix E 'DCC User Interface Services Schedule' (UISS) for Service Request Variant (SRV)11.1 'Update Firmware' not to SRV11.3 'Activate Firmware' as specified in the legal text v0.1. SECAS investigated this and have confirmed that the legal text should be applied to SRV11.3. This is because in the case of SMETS1 the firmware image blocks are sent to the Dual Control Organisation (DCO) via SRV 11.1 and stored at the DCO until all the blocks have been received, this triggers the 11.1 Response to the Supplier. When the Supplier subsequently sends the SRV11.3 the firmware will be forwarded to the Device and activated. In SMETS1 the 'updating' of firmware is only triggered when the SRV11.3 is received.

TRT and firmware flood prevention

The discussion revolved around the five-day TRT and the need to restrict the number of firmware image updates sent to the DCC. TABASC members agreed that a five-day TRT should be achievable if the number of updates is controlled, as the DCC aims to prevent flooding with large SMETS1 firmware updates.

Solution development

Should additional capacity be delivered?

The Proposer believes that the solution would need to ensure the process can be monitored for performance but not require large investment in infrastructure for an event that is infrequent.

During the Refinement Consultation three out of five Suppliers believed the Proposed Solution may resolve issues recognised with TRT compliance and firmware processing however did highlight that the Proposed Solution does not address the underlying issue of not being able to process all firmware updates within the set TRT.

The DCC has advised the infrastructure costs associated to be able to complete the firmware upgrades including these very large images within the current TRT will be several million pounds. Therefore, the intent of the modification is not to implement more capacity, but to help smooth the traffic peaks to prevent the DCC Systems being put under strain.

Extension or removal of the SLA?

The OPSG Chair suggested for images which the solution is proposing to be exempt from the current TRT, that there should be another TRT specific to those images. Concerns were expressed by one Large Supplier advising that if the DCC takes more than seven days to process SRV 11.1 'Update Firmware' then it will fail. In turn, this means they would need to amend their process if images taking longer than seven days to process. SECAS advise that this should be discussed with the DCC Service Desk when agreeing a schedule.

In addition, SECAS and the Proposer are suggesting that the five-day TRT applies to each batch from the point it is released onto the DCC System. Respondents to the Refinement Consultation highlighted the importance of meeting and maintaining TRT. This would mean that the current reporting will still reflect performance on the DCC System.

The Working Group agreed that any TRT extension should apply to as few scenarios as possible. The OPSG expressed concerns about the initial legal text (v0.1) being too broad, which meant that the DCC would have excessive flexibility and discretion. The original legal text proposed that the DCC will have the ability to decide when they can process all firmware images. Further discussions between SECAS and the Proposer have provided clarity on the suggested maximum size of SMETS1 firmware image that should be sent by Users should be set at 750kB. The Proposed Solution was narrowed to specifically state that any Party wishing to upgrade SMETS1 firmware images over 750kB and in a batch size larger than 500 images should first contact the DCC Service Desk.

Batch size consideration

A TABASC member suggested that the TRT could stay at five days if batch sizes are reasonable, there was a preference for defining batch sizes, this approach would help set clear expectations and avoid overloading the DCC's Service Desk. The DCC has subsequently confirmed that the TRT would apply if firmware images which are over 750kB are batched in increments of 500 or less. Any batches greater than 750kB and 500 images would require the responsible Party to contact the DCC Service Desk to come to an agreement on how to batch the requests. A TABASC member mentioned the possibility of the User sending all their firmware updates to the DCC so that the DCC can separate them into batches for sending across the network. The TABASC believed that the batching should remain within the Supplier's remit. A concern was raised by a TABASC member regarding the DCC's use of a first-come, first-served approach to batching, which could potentially result in unequal service provision for Users. It's important to note that the DCC is bound by its license to ensure fairness and equity in service delivery, making it their responsibility to uphold these standards.

One Large Supplier had questioned how far apart batches must be in time and how frequently can they be sent. The DCC have responded advising a User can send batches daily.

Another Large Supplier expressed that there is a lack of clarity on whether the limit of 12,000 SMETS1 firmware deployments where the file size exceeds 750kB a day is across all Suppliers or if a limit is to be imposed for each Supplier. The DCC have responded advising the DCC can handle up to 12,000 firmware images larger than 750kB each day. This means that if one Supplier submits a batch of 12,000 another Supplier cannot send more on the same day. This modification does not apply to Firmware images under 750kB (the vast majority of firmware images).

A Large Supplier had questioned on how the DCC would handle Suppliers still having to complete SMETS1 Enrolment and Adoption (E&A) due to there being an increased need for firmware upgrades to those assets post enrolment and that it may impact on thresholds. The DCC responded advising there is no impact on thresholds as any post enrolment updates would be handled in the same way as the updates specified in the modification. Parties with large firmware images over 750kB in size who wish to send more than 500 firmware updates should contact the DCC to arrange the schedule for the updates. The DCC also advised that the firmware image sizes are a certain size now and there is a very low chance that the size will increase. It further believes that there is an increase in size it does not believe that it will not be a significant increase unless Meter Manufacturers add significant functionality to their SMETS1 meters. The DCC believes that the firmware size will remain close enough to the threshold that this modification still applies. The DCC has also said that given the SMETS1 meters are not being upgraded, there is no reason for a Meter Manufacturer to add features which would increase the file size.

A Large Supplier questioned the DCC on the rationale to agreeing to 750kB as it was understood originally that some SMETS1 firmware images would exceed 750kB. The DCC arrived at 750 kB as there are a minority of firmware image sizes greater than 750kB for which the DCC is unable to meet the five-day TRT due to System concerns. After this was communicated to TABASC members it was agreed that 750kB is deemed a suitable threshold.

Another Large Supplier questioned how the DCC propose to handle deployments across multiple Suppliers and asset variants. The DCC has responded saying it will handle all firmware deployments as currently unless the firmware image is greater than 750kB and is batched in increments larger than 500 images.

OPSG Reporting

The OPSG Chair raised the idea of introducing additional reporting in light of the modification. This suggestion was based on the need to ensure comprehensive oversight and monitoring of where a firmware image might exceed 750kB. It was proposed that more reporting mechanisms could help track and manage these specific situations.

However, the Proposer highlighted that additional reporting may not be necessary. It stated that the existing structure already includes a five-day TRT that governs the transmission of firmware images. This TRT essentially imposes a time limit on the DCC for completing the processing of firmware images.

Given the presence of the five-day TRT, the Proposer believed that the established reporting mechanisms would sufficiently address any concerns regarding the management and progress tracking of firmware images. The Proposer believed that the existing TRT, combined with the process set out in the modification, was adequate for ensuring the efficient processing of images without the need for additional reporting.

One Large Supplier highlighted that [MP242 'Change to Operational Metrics to Measure on Success'](#) is currently being discussed and that it suggests removing TRT/Round Trip Time (RRT) as a mechanism for success. They advise the legal wording will need to be reconsidered if and when MP242 is adopted and TRT's are discarded.

8. Case for change

Business case

Approving the modification will address the current issue in processing large SMETS1 firmware images. The Proposed Solution will allow the DCC to manage the updating of a minority of firmware images which are very large which if released onto the DCC Systems in large volumes would cause a degradation of System performance for all Users. Without the modification, the DCC would need to spend significant amounts of money on additional capacity which is not deemed cost effective.

Views against the General SEC Objectives

Proposer's views

The Proposer believes that this modification supports general SEC objective (b)¹ by enabling the DCC to meet its TRT.

Industry views

Four out of five respondents had said this modification would facilitate General SEC Objective (b). One Large Supplier also believed this modification would facilitate General SEC Objectives (a)², (c)³ and (g)⁴.

Views against the consumer areas

Improved safety and reliability

The modification will have no impact on safety or reliability.

Lower bills than would otherwise be the case

This modification will have no impact on consumer bills.

Reduced environmental damage

This modification will have no impact on reduced environmental damage.

¹ To enable the Data Communications Company to comply at all times with the General Objectives of the Data Communications Company (as defined in the Data Communications Company Licence), and to efficiently discharge the other obligations imposed upon it by the Data Communications Company Licence;

² To facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain.

³ To facilitate Energy Consumers' management of their use of electricity and gas through the provision to them of appropriate information by means of Smart Metering Systems.

⁴ To facilitate the efficient and transparent administration and implementation of this code.

Improved quality of service

This modification will have no impact on quality of service.

Benefits for society as a whole

The modification will have no impact on society as a whole.

Final conclusions

The Working Group expressed support for the solution to exempt very large firmware images from the TRT but also of having a specific set of circumstances for when the TRT will begin which applies to the exceptions. Members of the TABASC have agreed 750kB to be the threshold after being provided the rationale.

The OPSG had initially expressed that it believed the need for an infrastructure upgrade was necessary but subsequently agreed that it would not be a cost-effective solution, as the issue only applies to SMETS1 which is being phased out over the next 10-15 years.

Appendix 1: Progression timetable

Timetable	
Event/Action	Date
Draft Proposal raised	9 Feb 2023
Presented to CSC for initial comment	21 Feb 2023
CSC converts Draft Proposal to Modification Proposal	21 Mar 2023
Modification discussed with Working Group	3 Apr 2023
Modification discussed with OPSG	9 May 2023
Modification discussed with TABASC	5 Oct 2023
Modification discussed with Working Group	1 Nov 2023
Refinement Consultation	25 Oct 2023 – 15 Nov 2023
<i>Modification discussed with Working Group</i>	<i>8 Feb 2024</i>
Refinement Consultation	14 Feb 2024 – 6 Mar 2024
<i>Modification Report approved by CSC</i>	<i>19 Mar 2024</i>
<i>Modification Report Consultation</i>	<i>20 Mar 2024 – 22 Apr 2024</i>
<i>Change Board Vote</i>	<i>24 Apr 2024</i>

Italics denote future events that may be subject to change

Appendix 2: Glossary

This table lists all the acronyms used in this document and the full term they are an abbreviation for.

Glossary	
Acronym	Full term
CSC	Change Sub-Committee
DCC	Data Communications Company
DCO	Dual Control Organisation
ESME	Electricity Smart Metering Equipment
E&A	Enrolment and Adoption
OPR	Operational Performance Regime
OPSG	Operations Group
RTT	Round Trip Time
S1SP	SMETS 1 Service Providers
SEC	Smart Energy Code
SECAS	The Smart Energy Code Administrator and Secretariat
SMETS	Smart Metering Equipment Technical Specifications
SMKI PMA	Smart Metering Key Infrastructure Policy Management Authority
SRV	Service Request Variant
SSC	Security Sub-Committee
TABASC	Technical Architecture and Business Architecture Sub-Committee
TRT	Target Response Time
UISS	User Interface Services Schedule