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MP230

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

Modification Report

Version 1.0

22 May 2024

Corporate member of
Plain English Campaign
Committed to clearer
communication

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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 five 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 first Refinement Consultation.
- **Annex D** contains information on how firmware requests would be prioritised.
- **Annex E** contains the full responses received to the second Refinement Consultation.

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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 (SMETS1) 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 without impacting the performance of the DCC System.

The Proposed Solution states 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 must 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 apply from the point of sending each batch.

This modification impacts all Suppliers as well as 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 November 2024 SEC Release.

2. Issue

What are the current arrangements?

The DCC Total System has a limit to the amount of large (>750kB) Smart Metering Equipment Technical Specification (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 670,000 SMETS1 Devices with these particularly large images. This is approximately 5.8% of all SMETS1 Devices. 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.

Impact on consumers

There are no impacts to consumers.

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.

Amendments to SEC Appendix E 'DCC User Interface Services Schedule' (UISS) will be required to implement this change. The redlined changes can be found in Annex B.

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

Suppliers will see their firmware images which are greater than 750kB and in batches larger than 500 images 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. The DCC have indicated that currently five Suppliers manage portfolios which have over 500 Devices which would encounter this issue.

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 first 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.

During the second Refinement Consultation both respondents confirmed that their organisations will incur costs but anticipate them to be lower than £100,000. The costs stem from additional resources to implement the batching for any SMETS1 firmware deployment captured in this modification.

6. Implementation approach

Approved implementation approach

The Change Sub-Committee (CSC) has agreed an implementation date of:

- **7 November 2024** (November 2024 SEC Release) if a decision to approve is received on or before 24 October 2024; or
- **27 February 2025** (February 2025 SEC Release) if a decision to approve is received after 24 October 2024 but on or before 13 February 2024

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

One Respondent supported the proposed implementation approach explaining it is a low cost and method of resolving the issue. Another responded mentioned that requiring Suppliers to do the batching may cause them difficulties and questioned whether or not the updates will still go through if not batched correctly. The DCC advise that batches do not have to be batched exactly in 500 but batches over 500 which include 750kB firmware updates must be dealt with by reaching out to the DCC Service Desk. The DCC stated there is a small risk that some requests may timeout but that the requests could be retried as a new batch afterwards.

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	To confirm if emergency related firmware would be affected
SMKI PMA	No input

Managed by

Sub-Committee input	
TABASC	To review if a DCC System change is the most cost-effective way to resolve this issue alongside agreeing the upper limit of a firmware image.

Observations on the issue

Views of the Change Sub-Committee

A 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

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.

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.

Views from SSC

SECAS provided a verbal update to the SSC and advised that emergency related firmware updates are addressed in a different way from larger firmware updates. SECAS explained that an incident is raised and prioritised and that a safety test is conducted to ensure the Devices would not be impacted negatively and that the urgency is evaluated on priority level with the option to halt other firmware traffic to prioritise security related updates quicker.

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 first 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.

During the second Refinement Consultation both respondents confirmed that the solution put forward will resolve the identified issue. One respondent mentioned that it provides a very low cost solution. And another respondent mentioned the solution does resolve the issue however the solution gives adds difficulty for Suppliers as they will need to batch the larger firmware updates.

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 Service Request Variant (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 first 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. 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. Once a delivery schedule is agreed then the TRT will apply.

The TRT will continue to apply if firmware images which are over 750kB are batched in increments of 500 or less, per day.

Restriction applied to 'Update firmware or 'Activate firmware'?

A TABASC member emphasised that the threshold should apply in SEC Appendix E 'DCC User Interface Services Schedule' (UISS) for SRV 11.1 'Update Firmware' not to SRV11.3 'Activate Firmware' as specified in the legal text v0.1. SECAS investigated this and has 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.

Image size

A Large Supplier questioned the DCC on the rationale for agreeing to 750kB being the threshold, as it was understood originally that some SMETS1 firmware images would exceed 750kB. The DCC determined 750kB 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.

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.

TABASC members agreed that 750kB was deemed a suitable threshold.

Batch size

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 can manage up to 12,000 firmware images larger than 750kB each day. A 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.

This issue was discussed with the Working Group, after the initial Refinement Consultation. The updated solution being that DCC Users who wish to send firmware images in batches that are larger than 500 which include firmware images over 750kB would need to contact the DCC Service Desk. This amendment to the batch size will allow DCC Users to act within DCC's capacity of handling larger firmware images which is 12,000 larger firmware images a day without the need of an infrastructure upgrade which would include a very large cost.

SECAS highlighted the DCC capacity stated, is across all Suppliers and that this modification formalises a process which is already being carried out by Suppliers and the DCC. The Proposer advised the limit of batches larger than 500 images which have images over 750kB are there to ensure the success rates of all other SRVs are not affected. They noted that the larger firmware image traffic is managed as well as the scheduled daily traffic using any spare capacity as this is to ensure the DCC can stay within infrastructure limits and licensing limits.

The DCC has subsequently confirmed that batches of images 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.

Frequency of batches

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.

Prioritisation

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.

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.

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.

The DCC advised they will arrange a delivery schedule with the first user as the DCC will be operating within operating limits. For instances where a delivery schedule has been agreed with the first User and an incoming second User reaches out the DCC via the DCC Service Desk will manage the schedules either by reaching out to the first User to inform them of their schedule being altered or finding a suitable window for the second Users firmware images to be delivered. An SSC member highlighted that this is the only SRV which includes a process where a DCC User must contact the DCC Service Desk. The SSC member suggested including legal text in the solution to state if the request is emergency or security related, to follow the security protocols. However, SECAS believe incorporating such legal text in this SRV would require it to be introduced against every SRV which adds unnecessary complexity.

Impact on Enrolment and Adoption

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.

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 this 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 infrastructure to meet the TRTs 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

First Refinement Consultation

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.

Second Refinement Consultation

One responded had said this modification would facilitate General SEC Objective (b). The other respondent believed this modification would facilitate General SEC Objective (a).

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.

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.

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 image size 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. There are no DCC costs and only a minimal SECAS cost to implement.

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

Timetable	
Event/Action	Date
Modification discussed with Working Group	1 Nov 2023
First Refinement Consultation	25 Oct 2023 – 15 Nov 2023
Modification discussed with Working Group	7 Feb 2024
Second Refinement Consultation	27 Mar 2024 – 19 Apr 2024
Modification discussed with SSC	8 May 2024
Modification Report approved by CSC	21 May 2024
Modification Report Consultation	22 May 2024 – 13 Jun 2024
Change Board Vote	26 Jun 2024

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