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MP155 'Communications Hub Re-Flash'

Modification Report

Version 0.5

15 August 2022



About this document

This document is a Modification Report. It currently sets out the background, issue, impacts and progression timetable for this modification, along with any relevant discussions, views and conclusions. This document will be updated as this modification progresses.

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This document also has two annexes:

- **Annex A** contains the business requirements for the solution.
- **Annex B** contains the full Data Communications Company (DCC) Preliminary Assessment response.

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1. Summary

This proposal has been raised by Tom Rothery from the DCC.

Currently, the Smart Energy Code (SEC) allows for the return of Communications Hubs in accordance with SEC Section F 'Smart Metering System Requirements' and Appendix I 'CH Installation and Maintenance Support Materials'.

However, the SEC does not currently accommodate the process of returning a Communications Hub to the DCC for the purpose of re-flashing the Device and then retaking delivery of that Device once the re-flashing process has been complete. Nor does it cater for re-flashing a Device whilst it is still in the supply chain. Furthermore, there is not an Explicit Charge that could be used for this service.

This modification is expected to impact the DCC, Supplier Parties and Other SEC Parties.

The Proposed Solution is for the DCC to create a process with its Service Providers whereby the DCC User can request a service to have the Communications Hub returned, re-flashed to the latest firmware version and re-delivered.

This modification will impact Suppliers, Other SEC Parties who order Communications Hubs and the DCC. The DCC Preliminary Assessment estimates the costs for Design, Build and Pre-Integration Testing (PIT) at £3,730,000. This change is targeted for the November 2024 SEC Release and is a Self-Governance Modification.

2. Issue

What are the current arrangements?

Communications Hub re-flashing

Manufacturers can develop Devices with non-operational interfaces to enable maintenance, diagnostics and refurbishment. The interfaces are designed to process instructions that are not defined in the Great Britain Companion Specification (GBCS). 'Re-flashing' is a process that delivers firmware upgrades to a Device using these interfaces. It means the Device can have its firmware upgraded without the Device first being installed in the field. The alternative is an Over The Air (OTA) upgrade which, when run at installation, can take a significant amount of time and increases the length of installation.

Guidance on re-flashing Devices has previously been developed and approved by the Security Sub-Committee (SSC) in conjunction with industry and any 'flashing' of Communications Hubs must comply with this guidance.

However, there is currently no mechanism in the SEC for the Communications Service Provider (CSP) to re-flash the Communications Hubs to uplift the firmware to the latest available before delivering to the User.

Communications Hub returns

The SEC does not currently specify that the DCC has to deliver Communications Hubs that support the latest firmware version available. Instead, the ordering and delivery processes as set out in SEC

Section F only require the DCC to deliver the requested volume of the specified Home Area Network (HAN) Variant Communications Hubs.

Currently, the SEC allows for the return of Communications Hubs in accordance with SEC Section F and Appendix I. SEC Parties can return Communications Hubs to the DCC and will be charged either one of two Explicit Charges:

- K7.5(o) – CH returned and redeployed
- K7.5(p) – CH returned and not redeployed

These Explicit Charges are set at the beginning of each Regulatory Year and can be found in the DCC Charging Statement.

Release 1.3 Communications Hubs

Due to the transition from Release 1 Communications Hubs to Release 2.0 Communications Hubs, the DCC offered a reflash capability in the North Region to upgrade firmware. This re-flashing activity enabled SEC Parties to return Communications Hub supporting v1.38.3 and v1.37.7 firmware to the CSP North to be re-flashed to a Release 2.0 firmware at no additional cost.

What is the issue?

The SEC does not currently accommodate the process of returning a Communications Hub to the DCC for the purpose of re-flashing the Device and then retaking delivery of that Device once the re-flashing process has been complete. Furthermore, there is not currently an Explicit Charge that could be used for this service.

Whilst the capability to reflash Communications Hubs in the North Region has been established, there will be associated charges going forward for all Regions and a process will need to be defined, which will require changes to the SEC.

There are two issues associated with re-flashing Communications Hubs firmware that this modification aims to address:

1. Communications Hubs already in the Supply Chain i.e., with the CSPs ready for distribution to DCC Users may be on a previous firmware version to the latest of Communications Hub firmware. Currently there is no mechanism for the CSP to “re-flash the Communications Hubs to uplift the firmware to the latest available before delivering to the User.
2. Communications Hubs on older firmware versions are currently being held in volume by DCC Users, with Users tending to install the Communications Hubs on the latest versions first so these numbers are not reducing at speed. There are no current provisions that accommodates the process of returning a Communications Hub to the DCC for the purpose of re-flashing the Device and then retaking delivery of that Device once the re-flashing process has been complete. Furthermore, there is not currently an Explicit Charge that could be used for this service, meaning the costs for this would be spread across all Parties.

What is the impact this is having?

If this issue is not resolved, Communications Hubs supporting older versions of firmware will continue to be held in volume by CSPs and DCC Users. If these Communications Hubs are not installed by the

relevant Installation Validity Periods (IVP) as set out in SEC Schedule 11 (Technical Specifications Applicability Tables (TSAT)), there is a risk that these Devices will need to be scrapped. Therefore, re-flashing Communications Hubs will have commercial benefits for Suppliers in ensuring their existing stock volumes are optimised and there will be minimal costs incurred from scrapped Communications Hubs. [MP191 'Extending CHTS v1.0 & v1.1 IVP and MVP end dates'](#) was raised specifically to extend the IVP for Communications Hubs that are compliant with Communications Hub Technical Specifications (CHTS) v1.0 and CHTS v1.1 within the TSAT. This modification will provide an enduring solution by providing a service to upgrade the firmware in advance of installation.

Impact on consumers

Not resolving this issue could increase the chance of consumers being left with out-dated Communications Hubs which do not allow consumers to reap the full benefits of smart metering.

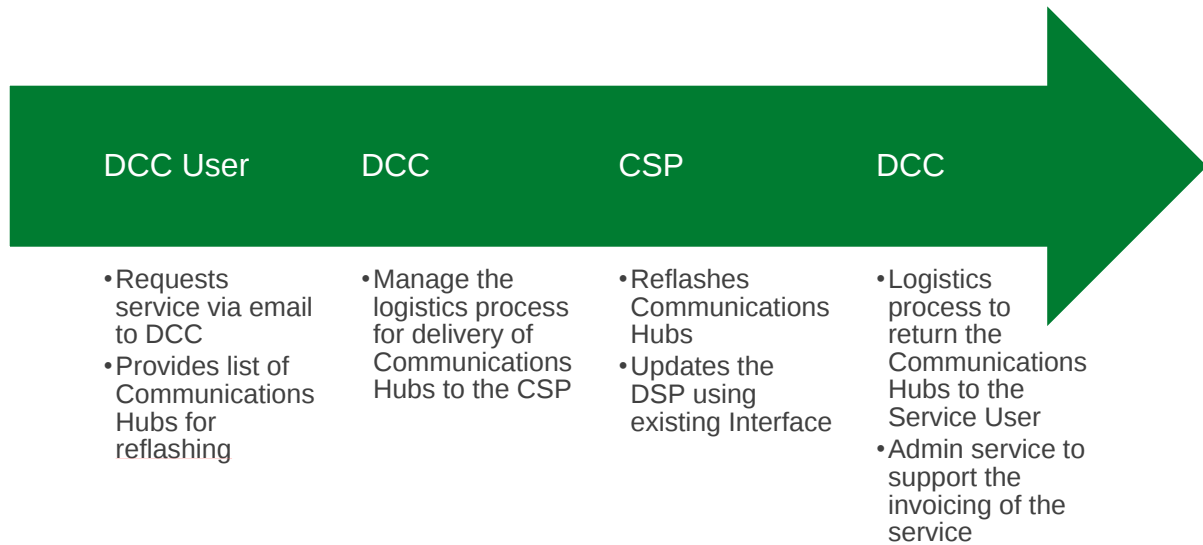
3. Solution

The DCC will implement a process to manage requests from SEC Parties to re-flash Communications Hubs. These requests to re-flash batches of Communications Hubs will be recorded as Work Orders in the DCC Service Management System and assigned to the relevant CSP. The relevant CSP will update each Communications Hub that is returned to it for re-flashing to the latest production Firmware Version for that Device Model and redeliver it to the SEC Party that requested the service.

After the Communications Hub has been uplifted to the latest available firmware via a re-flash, the CSPs will update their asset records with the new Firmware Versions. They will then notify the Data Service Provider (DSP) using the existing Communications Hub Pre-Notification interface within the CSP Management Gateway.

On receipt of the notification from the CSP, the DSP will update the Smart Metering Inventory (SMI) with the new information received, including any updates to the Firmware Version.

The CSPs will both need to develop and implement processes to re-flash Communications Hubs at scale. CSP Central and South has noted this will include development of a 'multi-jig' solution that could handle up to eight Communications Hubs in parallel.



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

Breakdown of Other SEC Party types impacted			
	Shared Resource Providers	✓	Meter Installers
	Device Manufacturers		Flexibility Providers
✓	Meter Asset Providers (MAPs)		

Suppliers and Other SEC Parties that place orders for Communications Hubs will be able to return these to the DCC to have them upgraded to the latest firmware efficiently and redelivered before installing these at consumer premises.

DCC System

The DCC will need to develop and implement this new service, calculate an Explicit Charge and ensure the back-office processes are in place to manage the end-to-end delivery. It is not expected to impact upon the DCC Total Systems.

SEC and subsidiary documents

The Smart Energy Code Administrator and Secretariat (SECAS) and the DCC will assess the full impacts to the SEC as part of the DCC Impact Assessment.

The following parts of the SEC will likely be impacted:

- SEC Section K 'Charging Methodology'
- Appendix I 'CH Installation and Maintenance Support Materials' (CHIMSM)

Devices

Devices impacted			
	Electricity Smart Metering Equipment		Gas Smart Metering Equipment
✓	Communications Hubs		Gas Proxy Functions
	In-Home Displays		Prepayment Meter Interface Devices
	Standalone Auxiliary Proportional Controllers		Home Area Network Connected Auxiliary Load Control Switches
	Consumer Access Devices		Alternative Home Area Network Devices

This process will allow SEC Parties to return Communications Hubs that are untouched, in their original packaging to the CSPs to reflash them onto the latest firmware version and then be redelivered to that Supplier. The modification will not impact Device behaviour.

Consumers

This modification will aim to benefit consumers by ensuring they have the latest possible version of Communications Hubs installed and to provide a better consumer experience by preventing prolonged installation times. It should help to shorten installer timescales and therefore increase roll out efficiency.

It will also reduce disposal of out-of-date Communications Hubs which would be a cost to SEC Parties and ultimately be passed onto the consumer

Other industry Codes

This modification will not impact other Industry Codes.

Greenhouse gas emissions

This modification will reduce the impact on greenhouse gas emissions by minimising the number of Communications Hubs that would need to be disposed of.

5. Costs

DCC costs

The estimated DCC implementation costs to implement this modification is £3,730,000 up until the end of PIT. The breakdown of these costs are as follows:

Breakdown of DCC implementation costs	
Activity	Cost
Design, Build and PIT	£3,730,000
Systems Integration Testing (SIT)	TBC
User Integration Testing (UIT)	TBC
Implement to Live	TBC
Application Support	TBC

More information can be found in the DCC Preliminary Assessment response in Annex B.

SECAS costs

The estimated SECAS implementation cost to implement this as a stand-alone modification is one day of effort, amounting to approximately £600. 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

The costs for this modification are expected to be covered by the Users of the service via an Explicit Charge. There are many factors that influence the Explicit Charge calculation, including fixed and variable cost elements, forecast demand, cost recovery period etc., so the below figures can only be treated as illustrative. The fixed cost element is also sensitive to the number of Communications Hubs that we forecast needing to re-flash, as the CSPs would need to procure sufficient capacity (facilities, equipment etc.) to process those volumes.

Estimated values for explicit charge	
Volume of Communications Hubs submitted to be re-flashed over 12 month period	Indicative estimate for Explicit Charge
~300,000	£7.58 – £12.03
~130,000 and below	£30+ (breakeven point vs Explicit Charge K7.5 (p))
~50,000	£80+

It should be noted that should the DCC be asked to implement this service but not be able to recover the full cost through an Explicit Charge (i.e. the demand doesn't materialise), any unrecovered funds would be socialised through the main fixed charge.

6. Implementation approach

Recommended implementation approach

SECAS is recommending an implementation date of:

- **7 November 2024** (November 2024 SEC Release) if a decision to approve is received on or before 31 May 2023; or
- **26 June 2025** (June 2025 SEC Release) if a decision to approve is received after 31 May 2023 but on or before 28 February 2024.

Due to the estimated time required to complete the DCC Impact Assessment of 90 working days, it will be unlikely to reach a decision on the modification before Q2 2023. The lead time for the implementation is 12 months up to the end of PIT meaning the earliest this modification could be targeted for would be November 2024 SEC Release.

7. Assessment of the proposal

Observations on the issue

Change Sub-Committee (CSC)

The CSC noted the benefits of this modification. However, it questioned:

- What the explicit charge for the proposed service would be;
- Whether the DCC has an idea of the volume of Communications Hubs impacted by this;
- Who will be responsible for the Communication Hubs that are in transit;
- How likely are people to use this; and
- What happens if the firmware version changed, and how this would be recorded in the SMI?

The CSC was cautious about implementing a change that would not be widely used and agreed that further development was required to understand the above points. The DCC confirmed that further analysis to produce up to date estimates of the number of Devices held will continue. The remaining points will be addressed as part of the Refinement Process.

Other Sub-Committee views

The SSC advised that it had previously issued guidance on how Communications Hubs may be re-furnished and any process as part of the solution must be compliant with this guidance.

The Operations Group (OPSG) questioned whether the issue was specific to the transition from Release 1 Communications Hubs to Release 2.0 Communications Hubs. The DCC highlighted that the Communications Hub returns process agreed with the CSP North is a separate entity and not dependant on this modification, noting that Users can only return v1.38.3 and v1.37.7 Communications Hub stock free of charge for them to be re-flashed. As part of further development of the issue, the DCC has since expanded the scope of the modification to include all Communications Hubs that could benefit from a firmware update prior to delivery to a DCC User.

An OPSG member also questioned how the business case would be affected by the availability of any new 4G Communications Hubs in the future. The Proposer has advised that the timescales for delivery of the solution would feed into the business case for the existing stocks of 3G Communications Hubs but this information would not be available until after a Preliminary Assessment had been completed. They continued that the new 4G Communications Hubs would still utilise this process going forwards.

Solution development

An OPSG member stated that they would require new Advanced Shipment Notifications (ASNs) with any re-delivery, as the initial ones would have been processed by their systems and any duplication would be rejected. This has subsequently been specified within the business requirements.

Re-flashing Communications Hubs

A Working Group member queried if there was an overlap between this modification and the proposals around recommissioning faulty Communications Hubs, and whether these were similar activities. SECAS noted this modification is setting out the process for returning Communications Hubs for re-flashing. This approach will avoid security concerns as it reuses existing methodologies, following the guidance previously developed by the SSC, although the specifics of this would be clarified with the SSC as this modification develops. The DCC has confirmed that the Communications Hubs would be made available to the DCC User once re-flashed whereas when they are refurbished, they are not returned to the DCC User. The DCC also noted that the re-flashing service would accommodate far higher volumes of Communications Hubs.

Quantities for delivery and costs

A Working Group member questioned what the acceptable delivery sizes would be, querying whether they could use this process for individual Communications Hubs, or cartons, or if it had to be full pallets. The Proposer noted that they had initially explored this and thought it was likely that the process would be by the pallet load but asked the Working Group whether there was a preference.

A Working Group member suggested that the Working Group should determine the likely volume size they would want to return, whether that is by the unit, carton or pallet, for inclusion in the DCC Preliminary Assessment. As part of the Preliminary Assessment, the DCC considered these and has provided costs on a per Communications Hub basis.

8. Case for change

Business case

The DCC informed the Technical Architecture and Business Architecture Sub-Committee (TABASC) that the cost of scrapping the Communication Hubs was more economical once the number of Devices was below approximately 130,000, which at current rate of install would be reached by the end of 2023. The TABASC Chair noted this was a substantial cost for something which would be delivered too late for the benefit to be tangible. They noted that Users were still installing these Communications Hubs on older firmware versions alongside those on newer, which further weakened the business case. The Working Group also mirrored this view that this modification would not be able to be implemented soon enough to make it economically viable.

A SEC Party also noted that the costs of carrying out the Impact Assessment was very expensive and would be apportioned to Suppliers and Network Parties as with all modifications. all SEC Parties. The Working Group considered that the Impact Assessment should not be requested as the business case did not support the modification.

Views against the General SEC Objectives

Proposer's views

The Proposer's view is that this modification better facilitates SEC Objective (a)¹ by re-using existing Communications Hubs and not inconveniencing the consumer at installation by subjecting them to length installation times to upgrade the firmware.

Industry views

These will be gathered as part of the Refinement Consultation.

Views against the consumer areas

Improved safety and reliability

If implemented, this modification will have a neutral impact against this consumer area.

Lower bills than would otherwise be the case

If implemented, this modification will have a neutral impact against this consumer area.

¹ facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain

Reduced environmental damage

If implemented, this modification will have a positive impact against this consumer area by ensuring that Communications Hubs are used that may otherwise have been scrapped should their version not be supported.

Improved quality of service

If implemented, this modification will have a neutral impact against this consumer area.

Benefits for society as a whole

If implemented, this modification will have a neutral impact against this consumer area.

Support for Change

One Working Group member noted that Suppliers may not be installing Communications Hubs on the latest firmware as there are some defects that prevent them from using this version, citing the implementation of CRP535 onto the latest firmware versions as an example. They noted that this will cause the number of affected Communications Hubs to increase until this defect is resolved. They supported this proposal as a long-term service. It is noted this support was prior to the cost of the service being available.

Appendix 1: Progression timetable

This modification will now be issued for Refinement Consultation.

Timetable	
Event/Action	Date
Draft Proposal raised	18 Feb 2021
Presented to CSC for initial comment	30 Mar 2021
Presented to Operations Group for discussion	1 Jun 2021
Presented to CSC for final comment and recommendations	30 Nov 2021
Proposed Solution and business requirements developed with Proposer	Dec 2021
Business requirements discussed with Working Group	2 Mar 2022
Business requirements discussed with Operations Group	8 Mar 2022
DCC Preliminary Assessment requested	24 Mar 2022
DCC preliminary Assessment returned	15 Jun 2022
DCC Preliminary Assessment discussed with Working Group	6 Jul 2022
DCC Preliminary Assessment discussed with TABASC	7 Jul 2022
Refinement Consultation	15 Aug – 5 Sep 2022
<i>Modification discussed with Working Group</i>	<i>5 Oct 2022</i>
<i>Impact Assessment costs approved by Change Board</i>	<i>26 Oct 2022</i>

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Timetable	
Event/Action	Date
<i>Impact Assessment requested</i>	26 Oct 2022
<i>Impact Assessment returned</i>	10 Mar 2023
<i>Impact Assessment discussed with Working Group</i>	5 Apr 2023
<i>Impact Assessment discussed with TABASC</i>	6 Apr 2023
<i>Modification Report approved by CSC</i>	18 Apr 2023
<i>Modification Report Consultation</i>	19 Apr – 10 May 2023
<i>Change Board vote</i>	31 May 2023

Italics denote planned events that could 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
ASN	Advanced Shipment Notifications
CH	Communications Hub
CHIMSM	CH Installation and Maintenance Support Materials
CHTS	Communications Hub Technical Specifications
CSC	Change Sub-Committee
CSP	Communications Service Provider
DCC	Data Communications Company
DSP	Data Service Provider
GBCS	Great Britain Companion Specification
HAN	Home Area Network
IVP	Installation Validity Period
MVP	Maintenance Validity Periods
OPSG	Operations Group
OTA	Over-The-Air
PIT	Pre-Integration Testing
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator & Secretariat
SIT	System Integration Testing
SMI	Smart Metering Inventory
SSC	Security Sub-Committee
TABASC	Technical Architecture and Business Architecture Sub-Committee
TSAT	Technical Specifications Applicability Tables

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Glossary	
Acronym	Full term
UIT	User Integration Testing