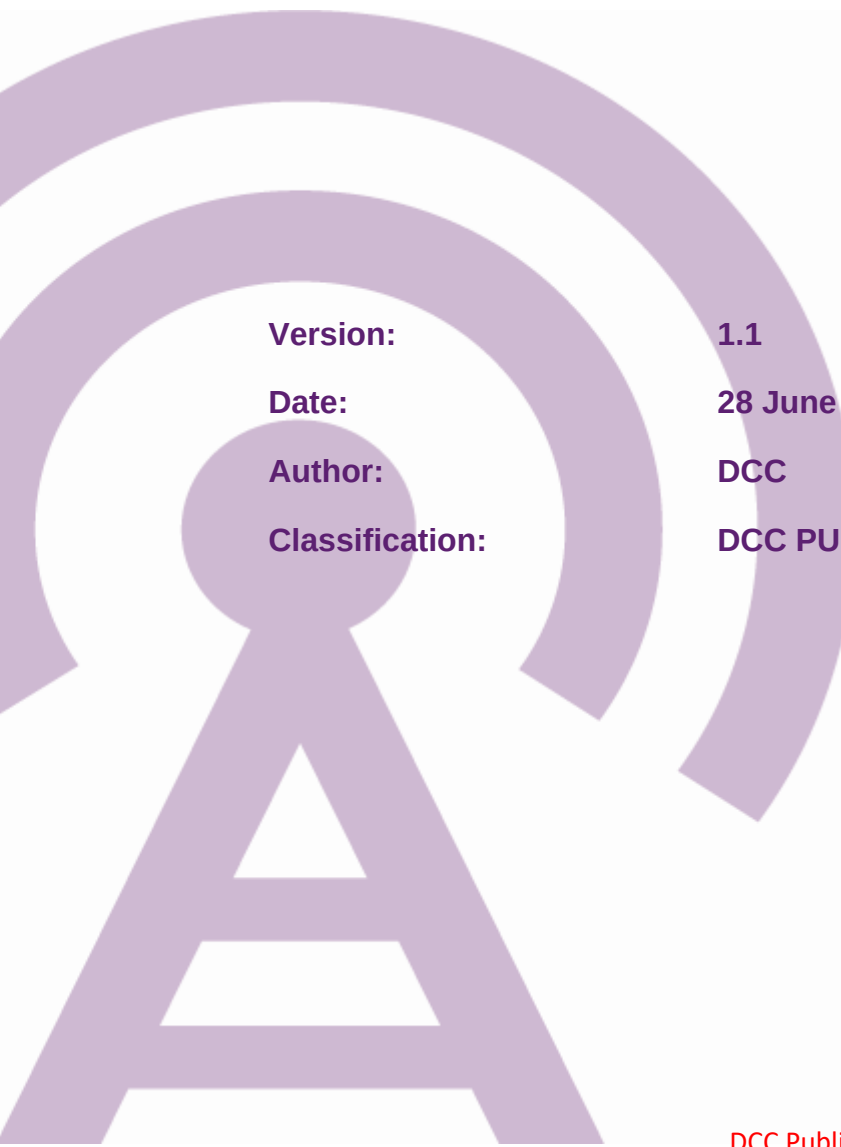


SEC Modification Proposal, MP155

DCC CR4639

Communications Hub Re-flash

DCC Preliminary Impact Assessment



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1 Executive Summary

MP155 proposes a process and associated system changes to facilitate re-flashing of Communications Hubs that are held in stock by SEC Parties to upgrade them to the latest Firmware Version, without relying on Over The Air (OTA) updates at the point of installation. Re-flashing is a procedure carried out by the Communications Hub manufacturer to update the Firmware on the device via an out-of-band mechanism that doesn't utilise the SMWAN.

DCC has identified two potential solution options. In both options, DCC and the CSPs will implement processes and system changes to support the return, re-flashing and re-delivery of batches of Communications Hubs. The options differ in terms of how updates to the Smart Metering Inventory (SMI) are initiated:

- Option A – the relevant CSP updates the SMI using current DSP interfaces to record the new Firmware Version; and
- Option B – DCC Logistics updates the SMI using a new file interface provided by DSP to record the new Firmware Version.

The DSP, CSP North, CSP Central and South are impacted by this change.

The Change Board are asked to approve one of the following options for Full Impact Assessment:

Option A

- Total cost to complete the Full Impact Assessment of £225,159;
- The timescales to complete the Full Impact Assessment of 90 working days; and
- ROM costs for MP155, for setup up to the end of Pre-Integration Testing (PIT) and for year 1 of operations of £3,730,000.

Option B

- Total cost to complete the Full Impact Assessment of £237,970;
- The timescales to complete the Full Impact Assessment of 90 working days; and
- ROM costs for MP155, for setup up to the end of Pre-Integration Testing (PIT) and for year 1 of operations of £3,730,000 to £3,880,000.

SECAS' MP155 Modification Report indicates that there is a preference for costs to be recovered via an Explicit Charge. As an illustration, based on the ROM costs above, DCC estimates an Explicit Charge of between £7.60 and £12 per Communications Hub.

Benefits

The main beneficiaries of the change are SEC Parties, who will gain the ability to utilise aged Communications Hub stock without encountering delays during installation while waiting for OTA updates to complete. A further benefit to SEC Parties is the avoidance of potential charges associated with scrapping Communications Hubs that are not installed by the relevant Installation Validity Period end date.

Maximising the potential for Communications Hubs already supplied to be installed also contributes to mitigating current supply shortages.

2 Introduction

2.1 Revision History

Revision Date	Revision	Summary of Changes
13/06/2022	1.0	Issued to SECAS
28/06/2022	1.1	Minor update following review

2.2 Associated Documents

This document is associated with the following documents:

Ref	Title and Originator's Reference	Source	Issue Date
1	MP155 Business Requirements v0.4	SECAS	
2	MP155 Modification Report v0.3	SECAS	

References are shown in this format, [1].

2.3 Document Information

The proposer for this Modification is Tom Rothery of DCC.

This Preliminary Impact Assessment was requested of DCC on 24 March 2022.

3 Context and Requirements

3.1 Problem Statement

There are two issues associated with re-flashing Communications Hubs firmware:

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.

N.B. The above problem statement is drawn from the SECAS MP155 Modification Report and alludes to re-flashing Communications Hubs that are in the DCC supply chain, however the SECAS MP155 Business Requirements, repeated below, refer only to Communications Hubs that have already been delivered to DCC Users. There are currently approximately 350,000 Communications Hubs with a Firmware Version of N-4 or older held in stock by SEC Parties.

3.2 Business Requirements

Ref.	Requirement
1	Smart Energy Code (SEC) Parties shall notify DCC when they want to re-flash Communications Hubs
2	DCC shall notify SEC Parties whether their request for re-flashing has been accepted or rejected
3	DCC shall confirm to SEC Parties authorisation of Communications Hub re-flash
4	SEC Parties shall send authorised Communications Hubs to DCC
5	DCC shall accept/reject delivery of Communications Hubs sent to DCC
6	DCC shall re-flash accepted Communications Hubs
7	DCC shall notify SEC Parties of successful Communications Hub re-flashing and re-delivery
8	SEC Parties shall notify DCC of any amendments to re-delivery
9	DCC shall re-deliver re-flashed Communications Hubs to SEC Parties
10	DCC shall update the Data Service Provider (DSP) inventory systems to map the new Firmware Version to the Communications Hub Global Unique Identification (GUID)

For the avoidance of doubt, the scope of this PIA is restricted to SMETS2 Communications Hubs that have been delivered to DCC Users and are in a Pending state.

4 Benefits

The Benefits associated with various Parties are noted following.

Organisation	Benefit
DCC	Re-flashing of Communications Hubs that have already been delivered but not installed may result in reduced demand for new orders, which contributes to mitigating current supply issues.
Service Providers	As above.
SEC Parties	Deploy older Communications Hubs that have remained in warehouse stock for months or years. Avoid delays during Installation of older Communications Hubs while firmware is updated OTA. Avoid Explicit Charges associated with scrapping Communications Hubs for which the Installation End Date has passed and which have to be returned to the DCC. If the approximately 300,000 Communications Hubs with N-4 or older firmware (and therefore are at risk of becoming obsolete) held in stock at the time of the PIA being requested were to be scrapped, the total cost to DCC Users would be £9.26 million.

Table 1 – Benefits

The Business Case will be elaborated as part of the Final Impact Assessment.

5 Impacted Domains

The impacted domains have been identified as follows:

Domain	Impact Summary (Option A)	Impact Summary (Option B)
CSP North	Business Support Systems Communications Hub manufacturer Communications Hub Management Logistics/ Asset Management Service & Operations Legal & Commercial	Business Support Systems Communications Hub manufacturer Communications Hub Management Logistics/ Asset Management Service & Operations Legal & Commercial

Domain	Impact Summary (Option A)	Impact Summary (Option B)
CSP Central and South	Business Support Systems	Incident Management Logistics/ Asset Management
DSP	N/A	Self-Service Management Interface
DCC	Logistics Legal & Commercial	Logistics Legal & Commercial
SEC Parties	Logistics/ Asset Management	Logistics/ Asset Management

Table 2

6 Impact on DCC's Systems, Processes and People

This section describes the overall solution and the impact of MP155 on DCC's Services and Interfaces that impact Users and/or Parties.

6.1 Description of Solution

DCC has identified two solution options, which differ only in terms of who (DCC Logistics or the relevant CSP) initiates an update to the SMI to record the new Firmware Version against each Communications Hub that has been re-flashed. From the perspective of the SEC Parties who would use the service, the options are indistinguishable. The options are:

Option A – following successful re-flashing of a Communications Hub, the new Firmware Version is recorded first in CSP systems and then the CSP initiates an update to DSP systems (i.e. the SMI) using the existing CSP Management Interface (N3 web service); and

Option B – following successful re-flashing of a Communications Hub, the new Firmware Version is recorded first in CSP systems and, once DCC is notified of successful completion of the re-flashing, DCC Logistics initiates an update to DSP systems (the SMI) using a new file interface accessed through the Self-Service Management Interface (SSMI).

Both options have the following features in common:

- DCC will implement a process to manage requests from SEC Parties to re-flash Communications Hubs;
- the relevant CSP will update each Communications Hub returned to it for re-flashing to the latest production Firmware Version for that Device Model and re-deliver the Communications Hub to the SEC Party who requested the re-flashing service;
- 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;
- communication between DCC and SEC Parties will be via email.

In both options, it is expected that the cost of providing the Communications Hub re-flashing service be passed on to the SEC Parties that make use of the service by means of an Explicit Charge.

6.2 Solution Option A

6.2.1 Impact on CSP North

The following items are considered within the scope supply for CSP North for delivery of this Modification:

- Implement a capability to re-flash Communications Hubs at scale, including provision of additional secure facilities to store and process the forecast volumes of Communications Hubs. Communications Hub supporting documents to be updated to reflect the process, including initiating an update to the SMI to record the new Firmware Version using the existing CSP Management Interface (N3 web service).
- Implement processes for unlocking Communications Hubs outside of the current returns process.
- Implement new Service Processes and Service Operations, logistics etc. Ordering / Returns Team would require new process for returning to the Communications Hub manufacturer, tracking and managing issues.
- Design, build, and system test modifications to the CSP North solution to implement Data and Structure changes to Ordering and Logistics, Billing and Financials, performance measures and service reporting within the CSP North Business Support Systems;
- Testing up to the end of PIT.

6.2.2 Impact on CSP Central and South

The following items are considered with the scope of supply by CSP Central and South for delivery of this Modification:

The following items are considered within the scope supply for CSP Central and South for delivery of this Modification:

- Re-flashing of Communications Hubs that have been delivered to SEC Parties (SEC Parties) and are in a pending state;
- Setup of a new service catalogue item to handle Communications Hub re-flashing requests. There will be a charge for this service catalogue item which will require an approved purchased order from DCC before CSP Central and South can provide the services requested for each individual request (as per the usual process);
- Design, build and system test modifications to the CSP Central and South CSP solution to support the process of handling the following key activities:
 - Requesting a batch of Communications Hubs for re-flashing via the establishment of a new service catalogue item;
 - If approved, the return of the Communications Hubs to the third party logistics partner;
 - Re-flashing of Communications Hubs to the latest Firmware Version;
 - Updating the Communications Hub Firmware Version recorded in the SMI using the existing CSP Management Interface (N3 web service); and
 - Sending the Communications Hubs back to the service user;

- Set up or expansion of secure dedicated area at the third party logistics partner premises (covers a one off setup activity and ongoing monthly rental/maintenance of this dedicated area);
- Updates to the third party logistics partner processes and IT systems to support the Communications Hub re-flash activities
- Updates to the third party logistics partner processes and IT systems to support the Communications Hub re-flash activities;
- Design, build and system test updates to the Test Bench software to perform firmware upgrade only, reducing the processing time;
- Development of a 'multi-jig' solution to perform firmware upgrades on a 'one to many' ratio as opposed to the 1-to-1 ratio currently used for refurbishment. This will mean that firmware updates can occur on multiple Comms Hubs in parallel. This is being designed to handle up to 8 hubs in parallel for the re-flash activity; re-flash activity;
- Provision of 3 'multi-jig' units to enable the processing of multiple units in parallel and therefore increase the throughput of the number of Communications Hubs re-flashed;
- Ongoing maintenance of these 'multi-jig' units, including periodic checks of the units, replacement of consumables and warranty fixes;
- Testing of the CSP Central and South solution up to and including the PIT test phase.

6.2.3 DSP Solution

Under Option A, after the Communications Hub device has been uplifted to the latest available firmware via a re-flash, CSPs will update their asset records with the new Firmware Versions and then notify DSP using the existing Communications Hub Pre-Notification (CSPM-N3) interface within the CSP Management Gateway.

On receipt of the notification from the CSP, DSP will update the SMI with the new information received on the CSPM-N3 interface, including any updates to the Firmware Version. Note that all parameters are mandatory on the CSPM-N3 interface and, therefore, all of them must be provided. This is existing functionality within the DSP solution and, therefore, no additional development effort is required.

6.2.4 Impact on DCC

Design, build and test the tools and templates to support administration of the process by which SEC Parties will make requests re-flashing of Communications Hubs.

6.2.5 Impact on SEC Parties

There is no impact on User Systems as a result of this change, save to the extent that SEC Parties requiring re-flashing of Communications Hubs will need to:

- Interact with DCC via email; and

- Provide lists of Communications Hubs for re-flashing in a format specified by DCC.

6.2.6 Technical Specifications

No changes to DUIS or GBCS will be required.

6.2.7 Impact on the SEC

This will be provided as part of the Full Impact Assessment.

6.2.8 Impact on Security

A detailed Security impact will be carried out as part of the Full Impact Assessment.

6.3 Solution Option B

6.3.1 Impact on CSP North

As for Option A, with the exception that CSP North systems will not initiate an update to the SMI to record the new Firmware Version using the existing CSP Management Interface (N3 web service).

6.3.2 Impact on CSP Central and South

As for Option A, with the exception that CSP North systems will not initiate an update to the SMI to record the new Firmware Version using the existing CSP Management Interface (N3 web service).

6.3.3 DSP Solution

Under Option B, the CSPs will not notify DSP following re-flashing of Communications Hubs. Instead, after a Communications Hub has been uplifted to the latest Firmware Version available via a re-flash, DCC Logistics will share the details of the Firmware Version with DSP.

A new file upload interface will be provided within SSMI for the purpose of re-flashing a list of identified Communications Hubs. This interface and the subsequent processing will be built in accordance with the existing processing patterns for file upload. The file will contain the list of Communications Hub IDs and the new Firmware Versions.

DSP will update the SMI with the new Firmware Version(s) for the list of Communications Hubs. Only Communications Hubs with an SMI status of 'Pending' will be eligible for re-flashing and this will be enforced by way of validation checks within SSMI.

6.3.4 Impact on DCC

Design, build and test the tools and templates to support administration of the process by which SEC Parties will make requests re-flashing of Communications Hubs.

6.3.5 Impact on SEC Parties

There is no impact on User Systems as a result of this change, save to the extent that SEC Parties requiring re-flashing of Communications Hubs will need to:

- Interact with DCC via email; and

- Provide lists of Communications Hubs for re-flashing in a format specified by DCC.

6.3.6 Technical Specifications

No changes to DUIS or GBCS will be required.

6.3.7 Impact on the SEC

This will be provided as part of the Full Impact Assessment.

6.3.8 Impact on Security

A detailed Security impact will be carried out as part of the Full Impact Assessment.

7 Testing Considerations

This section outlines the testing required to complete the Design, Build and Test phases for this SEC Modification.

7.1 Pre-integration Testing

During Pre-Integration Testing (PIT), each Service Provider tests its own solution to agreed standards in isolation of other Service Providers.

The design, implementation, Early Automated System Testing (EAST), System Testing, Performance Testing and Factory Acceptance Testing (FAT) phases will operate as a single phase of activity with a single drop into DSP's SIT-B environment.

FAT will consist of a defined subset of EAST tests being observed by DCC within the final one week of testing. The Schedule 6.2 exit criteria and defect mask will apply for the Pre-Integration Process.

7.2 Systems Integration Testing

Systems Integration Testing (SIT) is the testing of the DCC Total System, which brings together the components, e.g., DSP and CSP Systems, to allow testing of the end-to-end solution by DCC. SIT is carried out for every DCC System release and incorporates the test and integration of multiple changes.

7.2.1 Option A

The system changes involve the CSPs only as the updates to the SMI will be achieved via current functionality and therefore separate Service Provider integration testing will not be required.

7.2.2 Option B

If Option B is selected, MP155 will be tested in SIT with support from the CSPs. The change affects SMETS2 only. The proposed SIT scope is:

- CSP pre-notifies one SBCH Communications Hub for each Communications Hub manufacturer;
- The Communications Hubs are re-flashed, with DCC providing the SSMI upload file to update the SMI;

- There will be limited negative testing of the SSMI upload;
- CSP births each Communications Hub and SR11.2 is sent to confirm the firmware version present on the Communications Hub.

The testing will be executed for each Communications Hub manufacturer. This does not include any 4G Communications Hubs.

7.3 User Integration Testing

As the changes described under Options A and B do not impact the DCC User Interface or any of the Technical Specifications, DCC does not expect that User Integration Testing will be required as part of the implementation of this SEC Modification.

8 Implementation Timescales and Releases

8.1 Solution Option A

The system changes for this option will need to be packaged as part of a wider release, the timing of which will be dependent on the priority of this SEC Modification relative to other changes also awaiting scheduling for release.

For the purposes of this Preliminary Assessment, a prudent planning assumption would be that DCC requires a lead time of **12 months** from the date of approval, (in accordance with Section D9 of the SEC) to implement the changes up to and including the PIT complete stage.

Implementation timescales will be confirmed as part of the Full Impact Assessment.

8.2 Solution Option B

The system changes for this option will need to be packaged as part of a wider release, the timing of which will be dependent on the priority of this SEC Modification relative to other changes also awaiting scheduling for release.

For the purposes of this Preliminary Assessment, a prudent planning assumption would be that DCC requires a lead time of **12 months** from the date of approval, (in accordance with Section D9 of the SEC) to implement the changes up to and including the PIT complete stage.

Implementation timescales will be confirmed as part of the Full Impact Assessment.

9 DCC Costs and Charges

9.1 Cost Impact

The table below details the cost of delivering the changes and Services required to implement this Modification Proposal.

Implementation costs, MP155							
Phase:	Design	Build	PIT	SIT	UIT	Implementation to Live	Total
Solution Option A	£3,730,000 including setup and year 1 operation for the volumes estimated			Not applicable in PIA			£3,730,000
Solution Option B	£3,730,000 – £3,880,000 including setup and year 1 operation for the volumes estimated			Not applicable in PIA			£3,730,000 to £3,880,000
Implementation costs – supplementary information							
Implementation cost assumptions	A. Costs are exclusive of VAT and any applicable finance charges B. Majority of the costs above represent labour costs. C. Costs provided for Design, Build and Pre-Integration Testing are quotes provided by the Service Providers and assuming there is no scope change can be considered the final costs. DCC have reviewed and challenged the costs from the Service Providers to ensure this reflects best price to date. D. Costs will be refined during future assessments.						
Explanation of Implementation Phases	DCC’s implementation costs are provided by implementation phases. The following describes the purpose of each phase: - Design: The production of detailed System and Service design to deliver all new requirements. - Build: The development of the designed Systems and Services to create a solution (e.g. code, systems, or products) that can be tested and implemented. - Pre-integration Testing: Each Service Provider tests its own solution to agreed standards in isolation of other Service Providers. This is assured by DCC. - System Integration Testing: All Service Providers’ PIT-complete solutions are brought together and tested as an integrated solution, ensuring all Service Provider solutions align and operate as an end to end solution.						

- *User Integration Testing: Users are provided with an opportunity to run a range of pre-specified tests in relation to the relevant change.*
- *Implementation to Live Costs: The solution is implemented into production environments and ready for use by Users as part of a live service. This service is subject to implementation costs.*

Note that any transport costs will need to be quoted separately as this needs to be evaluated on a case by case basis based on the volume of Communications Hubs needing to be re-flashed and the delivery location.

9.1.1 Details for Option A

The fixed price cost for a Full Impact Assessment is £225,159 and would be completed in 90 working days.

CSP Central and South have indicated that they can provide a Full Impact Assessment within 30 working days.

CSP North has indicated that they can provide a Full Impact Assessment within 90 working days.

9.1.2 Details for Option B

The fixed price cost for a Full Impact Assessment is £237,970 and would be completed in 90 working days.

DSP and CSP Central and South have indicated that they can provide a Full Impact Assessment within 30 working days.

CSP North has indicated that they can provide a Full Impact Assessment within 90 working days.

9.2 Impact on Charges

This section describes the potential impact on Charges levied by DCC in accordance with the SEC.

The SECAS MP155 Modification Report indicates that there is a preference for the costs associated with the provision of the Communications Hub re-flashing service to be recovered from the SEC Parties who make use of the service, via a new Explicit Charge for each Communications Hub that is re-flashed.

There are many factors that will affect the final value of that Explicit Charge that is added to the DCC Charging Statement, should this Modification be implemented, such as:

- the fixed setup, fixed ongoing and variable ongoing costs for each Service Provider, which are option dependent and will be confirmed as part of the Full Impact Assessment;
- the period over which the fixed charges are recovered;
- the number of Communications Hubs for which SEC Parties request the re-flashing service.

Based on the costs presented in this Preliminary Assessment, for the volume of Communications Hubs included in assumption MP155-A-003, DCC has estimates that Explicit Charge would be approximately £7.60 per Communications Hub.

Were the service as sized for this Preliminary Assessment to be provided, but the forecast demand for Communications Hub re-flashing be revised down by 50% at the time of setting the Explicit Charge, then that Charge per Communications Hub would increase to approximately £12.

Note that the above figures are illustrative only. As part of the Full Impact Assessment, DCC will model a range of different scenarios for cost recovery and demand for the Communications Hub re-flashing service and provide estimates of the Explicit Charge in those scenarios.

10 RAID

The risks, assumptions, issues and dependencies below are applicable to both solution options.

Risks

Ref.	Risk Description	Status
MP155-R-001	There is a risk that, if the Communications Hub re-flashing fails, the affected device will need to be scrapped and cannot be re-delivered to the SEC Party.	Open
MP155-R-002	There is a risk that, if this service is made available, then SEC Parties will be less incentivised to manage their stock holding and install to First in First Out principles.	Open

Assumptions

Ref.	Description	Status
MP155-A-001	It is assumed that any Communications Hubs sent in by SEC Parties for re-flashing will be sent back to the same SEC Parties. This process will not support any transfer of ownership of Communications Hubs between SEC Parties.	Open
MP155-A-002	It is assumed that any monthly charges associated to Communications Hubs, which are triggered on delivery acceptance by SEC Parties, will continue to be charged regardless of the fact that Communications Hub has been returned for re-flashing.	Open
MP155-A-003	It is assumed that there will be restrictions in the volumes of Communications Hubs returned and frequency of initiating the Communications Hub returns process for re-flashing in order for CSPs to appropriately support the DCC. The final volumes and frequency of Communications Hubs returned for re-flashing will be determined at the FIA stage. For this PIA, the solution will be sized based on the following estimated volumes:	Open

Ref.	Description	Status
	- approximately 160,000 Communications Hubs requiring re-flashing by CSP Central and South over 12 months; and - approximately 140,000 CSP North Communications Hubs requiring re-flashing by CSP Central and South over 12 months, at a rate of up to 2 pallets (1,792 Communications Hubs) per month.	
MP155-A-004	It is assumed that there will be no change to the unlock command which is used to unlock the Communications Hub prior to conducting the re-flashing activity.	Open
MP155-A-005	It is assumed that the scope of this Modification only applies to Communications Hubs that have been delivered to SEC Parties and are in a pending state.	Open
MP155-A-006	It is assumed that the scope of this Modification only applies to Communications Hubs that have remained within the SEC Parties stores and remain in their original sealed packaging.	Open
MP155-A-008	It is assumed that re-flashing applies to Communications Hub that have not been installed. Communications Hub's that have been installed will follow the existing returns process.	Open
MP155-A-009	CSP North assumes that the re-flashing facility will be sized to store a maximum of 5 pallets of Communications Hubs.	Open
MP155-A-010	It is assumed that re-delivering re-flashed comms hubs to SEC Parties will be excluded from CHSMM order delivery regulations.	Open
MP155-A-011	It is assumed that there will be no change to existing performance measures.	Open

Ref.	Description	Status
MP155-A-012	It is assumed that there will be no SLA for this service, and it will not impact existing returns SLAs.	Open

Issues

None identified at this time.

Dependencies

Ref.	Description	Status
MP155-D-001	SEC Parties will provide a 6 monthly forecast on predicted re-flash volumes.	Open

Appendix A: Glossary

The table below provides definitions of the terms used in this document.

Acronym	Definition
CR	DCC Change Request
CSP	Communications Services Provider
DCC	Data Communications Company
DSP	Data Service Provider
FIA	Full Impact Assessment
I&C	Installation and Commissioning
OTA	Over the Air
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing

RAID	Risks, Assumptions, Issues and Dependencies
ROM	Rough Order of Magnitude (cost)
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SIT	Systems Integration Testing
SLA	Service Level Agreement
SMETS	Smart Metering Equipment Technical Specification
SMI	Smart Metering Inventory
SSI	Self Service Interface
SSMI	Self Service Management Interface
UIT	User Integration Testing