SEC Modification Proposal, SECMP0024

Enduring Approach to Firmware Management

Full Impact Assessment (FIA), DCC CR4032

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Contents

1 Executive Summary 3

2 Revision History 4

2.1 Associated Documents 4

2.2 Document Information 4

3 Solution Requirements and Overview 5

3.1 Context and Benefits 5

3.2 Business Requirements for this Modification 5

4 Solution Overview 6

4.1 DSP Solution Overview 6

4.1.1 Impacted DSP Components and Designs 6

4.2 Deliverables 8

5 Impact on DCC Systems, Processes, and People 9

5.1 DSP Team Impact 9

5.1.1 Implementation Team 9

5.1.2 Systems Integration Test (SIT) Team 9

5.1.3 User Integration Test (UIT) Team 9

5.2 Support for Integration Testing 9

5.3 Operational Support 9

6 Testing Considerations 11

6.1 Pre-Integration Testing 11

6.2 Post PIT 11

7 Implementation Timescales and Releases 12

7.1 Change Lead Times and Timelines 12

7.2 Costs and Charges 13

7.2.1 Application Support Costs 13

7.3 Impact on Contracts and Schedules 14

Appendix A: Risks, Assumptions, Issues, and Dependencies 15

Risks 15

Assumptions 15

Issues 15

Dependencies 15

Appendix B: Glossary 1

1 Executive Summary

The Change Board are asked to approve the following:

- Total cost to implement SECMP0024 of £512,003, which comprises:
  - £202,395 in Design, Build and PIT costs; and
  - £309,608 in release costs (SIT, UIT and Systems Integrator costs)
- The timescale to complete the implementation of eleven (11) months
- Include SECMP0024 as part of the June 2022 SEC Systems Release

Problem Statement

Currently, there is no system generated notification to Responsible Suppliers to confirm successful activation of Communications Hub firmware.

This Modification solution proposes that:

- the DCC is to generate an Alert to the Service User upon successful activation of Communications Hub firmware, containing the firmware version of the newly activated firmware.

Without the proposed changes:

i. a Service User receives no targeted notification from DCC that it can use as a trigger to update the firmware on the Meter(s) for which it is the Responsible Supplier in order to maintain the Smart Metering System to a reasonable level; and

ii. Service Users are reliant on repeatedly querying the Smart Metering Inventory to establish the current firmware version on each Communications Hub for which they are a Responsible Supplier, resulting in sub-optimal asset management processes.

Benefit Summary

The benefits of delivering this change include enabling Suppliers to:

- track progress of Communications Hub firmware update pilots;
- update back office systems to record the active firmware version on each Communications Hub, avoiding the need to query the Inventory periodically to obtain this information; and
- plan the deployment of firmware updates to other HAN Devices following activation of the new Communications Hub firmware.

2 Revision History

Revision Date	Revision	Summary of Changes
25/05/2021	0.1	Initial compilation from Service Provider
07/06/2021	0.2	DCC internal review completed
07/06/2021	0.3	Further DCC internal review completed

2.1 Associated Documents

This document is associated with the following documents:

#	Title and Originator's Reference	Source	Issue Date
1	Business Requirements v2.0	SECAS	19/02/2020
2	SECMP0024 CR4032 PIA CH Firmware Management v0.2	DCC	22/10/2020

2.2 Document Information

The Proposer for this Modification is Rob Williams of E.ON. The original proposal was submitted on the 27th October 2016.

Preliminary Impact Assessments (PIA) were requested of DCC on 1st May 2019 and 23rd September 2020, and the latest submitted on 22nd October 2020.

The Full Impact Assessment was requested on the 12th April 2021.

This document should be treated as a Confidential document and must be treated as a RED basis for SECAS distribution.

3 Solution Requirements and Overview

3.1 Context and Benefits

Currently, there is no system generated notification to Responsible Suppliers to confirm successful activation of Communications Hub firmware.

In previous iterations of this Modification, it was conceived that Responsible Suppliers would have some level of control over the target list of Communications Hubs that would receive firmware updates as part of a pilot phase and over the schedule for deployment of firmware to Communications Hubs during both pilot and mass deployment phases. A DCC Alert notifying successful activation was also proposed, to enable Suppliers to:

- track progress of Communications Hub firmware update pilots;
- update back office systems to record the active firmware version on each Communications Hub, avoiding the need to query the Inventory periodically to obtain this information; and
- plan the deployment of firmware updates to other HAN Devices following activation of the new Communications Hub firmware.

Whilst it was agreed by the Working Group that the planning and scheduling aspects of the previous iteration of the Modification are largely in place within the process described in the DCC Firmware Management Policy, and were hence removed from the scope of the Modification, the benefits associated with the additional DCC Alert remain valid.

3.2 Business Requirements for this Modification

The high-level business requirements for this Modification are as follows.

Req.	Requirement
1	The DCC is to generate an Alert to the Service User upon successful activation of Communications Hub firmware, containing the firmware version of the newly activated firmware.

Table 1: Business Requirements for SECMP0024, DCC CR4032

4 Solution Overview

This modification only impacts the DSP component of the DCC Total System.

4.1 DSP Solution Overview

DCC Data Systems will introduce a new DCC Alert to notify the Service Users of the successful activation of a Communications Hub (CH) firmware version. A new DCC Alert called Comms Hub Firmware Activation (N64) will be used. It will include the version of the active firmware on the Device. If the Service User uses a version of DUIS that does not support the newly introduced DCC Alert, then the DCC Alert N999 will be used to notify the firmware activation, including the firmware version.

The scenario in which the new DCC Alert is generated, including the recipients, is summarised in the table below.

Notification Scenario	Trigger	Condition	DCC Alert ID	Recipients
Successful Comms Hub Firmware Activation	Response from CH to the Activate Firmware request (CS06) sent by the CSP via CSP Management Gateway.	Response indicates new active firmware version.	N64	All Responsible Suppliers

Table 2: Criteria for DCC Alert N64

The definition of the new DCC Alert will be added to DUIS and the cost of DUIS uplift is provided in this FIA. There are no delivery dependencies on other DCC Service Providers in completing this change.

Note: The functionality within SECMP0024 (CR4032) is also part of the scope of SECMP0122B (CR1423). The changes under CR4032 are **DSP only** in nature, whereas the changes under CR1423 have dependencies on the CSPs. If approval is gained for CR1423 to go ahead, the overlap of functionality will be accounted for in the FIA for CR1423.

4.1.1 Impacted DSP Components and Designs

Request Management

Request Management will handle the DCC Alert generation.

Data Management

There will be minor changes such as reference data updates within Data Management.

DUIS/DUGIDS

DUIS and DUGIDS documentation will be updated to describe the behaviour of the new DCC Alert. The DUIS XML Schema will be updated to include the definition of the new DCC Alert. The DUIS extract is embedded here for reference. The DUGIDS changes will be provided to SECAS for inclusion in the June 2022 SEC Release.

DUIS Legal Text
Draft CR4032.docx

4.2 Deliverables

The deliverables of this Modification are described in the table below. These deliverables are split into two parts covering the implementation up to and including PIT, and the Post PIT activities required to deploy the changes into production (i.e. SIT, UIT and Transition To Operations).

This Modification is expected to be included in the June 2022 SEC Release, in which case the Post PIT deliverables will be rolled into the SEC Release.

Reference	Deliverable / Artefact	Changes Required (for artefact)
PIT DELIVERABLES		
Design and Solution Documentation		
SD2.1.1	Functional Specification – Instant Energy	Update
SD4.1	DCC User Gateway Interface Design Specification (DUGIDS)	Update
SD2.2.1.2	Component Design Spec - Request Manager	Update
SD2.2.1.4	Component Design Spec - Data Management	Update
SD2.2.1.4.3	Reference Data Definition (DS.0584)	Update
SD2.2.13	Component Model Diagram	Update
DUIS-related		
	DUIS XML Schema	Update to include definition of new DCC Alert
	DUIS documentation	Update
POST-PIT DELIVERABLES		
SIT		
TBC	Functional HeatMap	Create
DT.0034	System Integration Test Scenarios	Create/Update
In ALM	New & Updated Test Scripts	Create/Update
In ALM	Test Traceability Matrix mapped for SECMP0024	Update
TBC	Test Completion Report	Create
UIT		
	Run UIT Service Request regression test packs to prove existing functionality is still working as expected. Test packs will be run twice - on existing DUIS version and on new DUIS version introduced to accommodate SECMP0024.	
	Test reporting, including Test Completion Report	Create

5 Impact on DCC Systems, Processes, and People

This section describes the impact of SECMP0024 on DCC Services and Interfaces that impact Users and/or Parties.

5.1 DSP Team Impact

To implement the scope of supply as described in this Full Impact Assessment, DSP will supply the following services:

- Pre-integration (PIT) activities to align DSP functionality with the solution described in section 4.1;
- Preparation and Support for Solution Test and User Acceptance Testing;
- SIT support functions including support for issue investigation, resolution and deployment to SIT-B;
- Knowledge transfer from the PIT team to the Application Management Support team to enable support for the revised functionality in live operation; and
- A subset of the Programme Leadership and Operations team will be required to support the SECMP0024 resources.

5.1.1 Implementation Team

The design, implementation, System Testing and Factory Acceptance Testing (FAT) phase will operate as a single phase of activity with a single drop. FAT will consist of a defined subset of system tests being observed by DCC within the final two weeks of system test. The Schedule 6.2 exit criteria and defect mask will apply for the Pre-Integration Process.

5.1.2 Systems Integration Test (SIT) Team

The Systems Integration Test (SIT) team will be involved in the preparation and execution of Solution Tests and User Acceptance Testing in the SIT-B environment. This is activity is specific to the functional change introduced by SECMP0024 and excludes any wider release regression testing or uplift of A-Stream Environments.

5.1.3 User Integration Test (UIT) Team

The UIT Projects team will be involved in the preparation and Support for User Integration Testing on the UIT-B environment. This activity is specific to the functional change introduced by SECMP0024 and excludes any wider release regression testing or uplift of A-Stream Environments.

5.2 Support for Integration Testing

Effort will be required from the DSP PIT and Triage teams to support the additional testing. This consists of issue investigation, resolution and deployments to the SIT-B environment.

5.3 Operational Support

The Application Management Support team are responsible for the provision of application level support for the DSP System. This CR changes some core functionality of the DCC Data System and slightly increases system complexity. DSP has allowed three months Early Life Support, following Go Live, to cover any initial support issues.

6 Testing Considerations

This Full Impact Assessment includes the cost to develop, fully test and deliver this SEC Modification.

6.1 Pre-Integration Testing

The DSP PIT development team carries out unit testing and automated behaviour driven tests as part of DSP's continuous integration build and automated testing pipeline. The Early Automated System Testing (EAST) approach builds on this CI pipeline, helping to identify build issues and defects at the earliest opportunity. Any tests not run via EAST will be executed by the PIT System Test team manually. A Test Completion Report will be issued following the successful completion of PIT testing.

Acceptance will be defined by:

1. Completion of associated System Tests and achievement of the Schedule 6.2 defined defect mask for PIT exit, and
2. Approval from DCC Test Assurance of FAT completion and acceptance of PIT Exit.

6.2 Post PIT

The SIT and UIT phases of testing will be aligned with other Modifications and Change Requests in the target SEC release. System integration testing will be carried out on the B Stream environment i.e. SIT-B. There will be no separate testing on the A stream environments.

It should be noted that it is a requirement of the Testing Advisory Group (TAG) and Test Assurance Board (TAB) that a DUIS change of any nature should undergo full regression testing, which is the basis on which the Post PIT costs have been estimated. If the SEC Release in which this Modification is deployed contains no other DUIS changes and if the TAG and TAB were to relax the requirement for full regression testing in relation to this Modification, since the DUIS change is restricted to the addition of a single DCC Alert Code to the existing enumerated list in the DUIS XML Schema, then there would be a corresponding reduction in the Post PIT testing costs for the Release.

7 Implementation Timescales and Releases

This Modification is expected to be included in a SEC Release in June 2022. For the purposes of this FIA, timescales are shown for the development and PIT phase, and for the Post PIT activities that will be required as part of the release.

7.1 Change Lead Times and Timelines

The change will be implemented using a waterfall methodology such that a pre-integration implementation phase, consisting of design, development and system testing will precede a formal Systems Integration Test phase.

The pre-integration phase is expected to take approximately four months and the Systems Integration execution Testing phase is expected to last approximately five months and User Integration Testing a further month. Therefore, the change will be ready to schedule to a production release approximately ten months after full commercial cover has been provided by DCC to the Service Provider in the form of a CAN, which follows formal approval by SECAS of the release scope.

The broad breakdown of the testing regime is shown in the following table in months after an approval decision date (D).

Phase	Duration
SECAS agreement on scope of release	
CAN signature	D + 1 Month
Design, Build and PIT Phase	4 Months
SIT and UIT Phase (functional changes only), aligned with Release SIT and UIT dates	6 Months
Transition to Operations and Go Live	D + 11 Months

7.2 Costs and Charges

This section indicates the costs per application development stage for this Modification. Note that the implementation costs shown include the portion of the release costs (Post PIT) that are attributable to this Modification.

If, as DCC anticipates, the Modification is deployed as part of the June '22 release, the Post PIT costs shown below will be rolled into the SEC Release and associated CR.

£	Design, Build & PIT	Post PIT	Total
Phase Total	£202,395	£309,608	£512,003

Table 3: Cost Analysis

Design	The production of detailed System and Service designs to deliver the Modification 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 (PIT)	DSP tests its own solution to agreed standards in isolation of other Service Providers. This is assured by DCC.
Systems Integration Testing (SIT)	All the Service Provider's PIT-complete solutions are brought together and tested as an integrated solution, ensuring all solutions align and operate as an end-to-end solution.
User Integration Testing (UIT)	Users are provided with an opportunity to run a range of pre-specified tests in relation to the relevant change.
Implementation to Live (TTO)	The solution is implemented into production environments and ready for use by Users as part of a live service.

7.2.1 Application Support Costs

Application Support costs are any costs associated with supporting the new functionality and may include additional staff or infrastructure.

£	Application Support	Total
Phase Total	£20,963	£20,963

7.3 Impact on Contracts and Schedules

Contract updates will be required for this change. The detailed updates will be determined as part of the resulting Contract Amendment Note (CAN). Updates will be required to the following schedules:

- Schedule 4.1: Solution Design documents will need to be updated as per section 4.2 Deliverables.

There will be no change to Schedule 2.2 SLAs due to this Modification.

Appendix A: Risks, Assumptions, Issues, and Dependencies

The tables below provide a summary of the Risks, Assumptions, Issues, and Dependencies (RAID) observed during the production of the Full Impact Assessment. DCC requests that the Working Group considers this section and considers any material matters that have been identified. Changes may impact the proposed solution, implementation costs and/or implementation timescales.

Risks

Ref	Description	Status/Mitigation
R1	This change is to be implemented after the end of the initial term of the DSP Agreement. If any extended Agreement contains amended terms which affect DSP costs for change delivery, then the price for this Modification could be subject to variation.	Open

Assumptions

These assumptions have been used in the creation of this Full Impact Assessment. Any changes to the assumptions may require DCC to undertake further assessment, prior to the contracting and implementation of this change**.**

Ref	Description	Status/Mitigation
A1	Firmware used to upgrade the CHF will be firmware that has been tested previously.	Accepted
A2	It is assumed that this SECMP0024 will be delivered as part of an overall release, i.e. as part of June 2022 Release	Accepted

Issues

None at this time.

Ref	Description	Status/Mitigation

Dependencies

None at this time.

Reference	Dependency	Implication if dependency not met	Status
D1	In order for this Modification to be delivered as part of a yet to be defined SEC release, DCC will require commercial cover for that SEC release a minimum of	It may not be possible for this Modification to be included in the target SEC release.	To be

	ten months prior to the SEC release date.		

Appendix B: Glossary

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

Acronym	Definition
CH	Communications Hub, Comms Hub
CPL	Certified Products List
CR	(DCC) Change Request
CSP	Communication Service Provider
DCC	Data Communications Company
DCC-L	DCC Total System, DCC Licensing
FIA	Full Impact Assessment
GUID	Globally Unique IDentifier
PIA	Preliminary Impact Assessment
SEC	Smart Energy Code
SIT	System Integration Testing
SMIP	Smart Metering Implementation Programme
TAB	Test Assurance Board
TAG	Testing Advisory Group
UIT	User Integration Testing