Data Communications Company

SEC Modification Proposal

- DCC Preliminary Assessment (PA) - Final
- Mod Proposal Ref: SECMP0007
- Mod Proposal Title: Firmware updates to IHDs and PPMIDs
- Mod Path: Path 2 - Authority determination

Version:	**1.0**
Date:	**17 May 2017**
Author:	**DCC**
Classification:	**DCC PUBLIC**

Contents

1 Introduction

1.1 Document Purpose

The purpose of this DCC Preliminary Assessment (PA) is to provide the relevant Working Group with the information requested in accordance with SEC Section D6.9 and D6.10.

1.2 Previous information provided by DCC

This DCC Preliminary Assessment was requested of DCC on 10/06/2016.

1.3 DCC Contact Details

Please raise any queries regarding this DCC Impact Assessment using the contact details provided below.

Name	DCC - SEC Modification queries
Contact email	mods@smartdcc.co.uk

1.4 Modification description

This modification aims to provide an enduring solution to enable Energy Suppliers to carry out OTA firmware updates to supplier-provided IHDs and PPMIDs.

1.5 Requirements

The requirements for this modification have been developed by the Working Group during the Refinement phase. The impact on DCC has been assessed against the Business Requirements and the Solution Design Note(s) available on the SECAS website.

Based on the discussions at the Working Group and the Business Requirements as set out in the Solution Design Document, DCC understands the outcomes this modification wants to achieve however DCC also believes that it will need significant further refinement before a quality impact assessment can be produced. The main areas of uncertainty are:

- Non-functional requirements and (network and Comms Hub) performance data based on real usage scenarios. These would allow the SPs, particularly the CSPs, to perform proper modelling and analysis of their network capacity.

- The wider firmware management “problem” should be considered as a whole, as opposed to having separate SEC MODs developing independently. Solutions to each modification will impact the same HAN and use the same network.

- The requirements (and solution) should be formulated that cover all HAN topologies and variants.

Where the requirements or SEC obligations set out in the Solution Design Document above change, DCC will be required to carry out further impact assessment.

2 Impact on DCC's Systems, Processes and People

This section describes the impact of SECMP 0007 on DCC's Services and Interfaces that impact Users and/or Parties. DCC's solution for SECMP 0007 will enable Eligible Users to retrieve more accurate information from the GSME by providing the date-time attribute related to the date-time when the Gas Consumption and other instantaneous registers where updated. This improves the current behaviour where users can only use the GPF timestamp.

Because of the broader impact of this modification, the impacts in this PA are categorised by systems/area rather than by individual components.

2.1 DSP Systems

- CSP SMWAN Gateway

  New interfaces (one per CSP) required for sending a firmware image and a list of validated device IDs of PPMIDs or IHDs to the CSP, and for each device the associated CHF to which the request should be directed. There should be a mechanism to enable the CSP to reject device IDs if necessary (e.g. if they do not recognise a comms hub device ID), in a similar way to existing firmware updates.

- Self Service Interface

  - The SSI read inventory screen needs to be able handle a firmware version for an IHD.

  - 2 SSI Reports need to be updated to enable firmware versions to be reported for IHDs.

- Anomaly detection

  Anomaly detection volume thresholds will apply to the new Service Requests and will be mandatory for SR11.4, even though it is not a critical request; it is assumed to be similar to SR11.1 in this respect.

- ESI Inventory Extract

  The ESI inventory extract for the Device table needs to be able contain a firmware version for an IHD.

- Infrastructure Impact

  The change will lead to additional data processing. One instance of the new firmware upgrade Service Request message will trigger a lot more processing effort than typical Service Request messages, since one containing 50k device IDs would trigger validation of all them, the need to generate files, interact with both CSPs and require sending of approximately 100k DCC Alerts. Assuming the messages are billed appropriately, any additional hardware required would be handled through normal capacity planning processes.
  Note: the costs provided in this document do not include any infrastructure impact.

2.2 CSP Systems and networks

At a high level, the CSP changes are:

- Uplift the Communication Hubs to support the new commands to download mandated HAN devices as per GBCS guidelines;
- Modifications on CSP solution support the new commands, data model variables and reports required to implement the download of mandated HAN devices firmware;
- Implementation of a mechanism in the CSP solution to manage the queuing priorities of firmware distribution, to prioritise the ESME/GSME firmware distribution over other HAN devices.
- Uplift of billing and reporting systems/components.

More detailed solutions will vary between Telefonica and Arqiva and will be fully detailed in the full IA.

3 Impact on Security

An impact assessment on the security aspects of this modification will be carried out in the next stage (full IA).

4 Testing Considerations

This section describes the testing phases required to support the implementation of SECMP 0007.

4.1 Summary

- DCC will be required to carry out Pre-Integration Testing and System Integration Testing for SECMP 0007. HAN devices will be needed for testing.
- DCC anticipates that Users will require User Integration Testing to support their implementation of SECMP 0007. DCC asks that the Working Group considers and compiles the User testing requirements for SECMP 0007 with DCC support, to ensure an optimal approach is taken for User Integration Testing for the relevant release.

4.2 Pre-integration Testing

Pre-Integration Testing comprises of tests that each Service Provider performs on its respective System changes, prior to the integration of all Service Provider Systems. DCC has factored the cost of Pre-Integration Testing (including DCC assurance) into this Impact Assessment.

Suggested PIT scope would include:

- Production, review and agreement of a design to enable development;
- Low level design production, development, unit test and any rework to achieve PIT complete status;
- Data generation and loading into the Test environment;

- Execution of System Tests through sufficient iterations to enable PIT complete;
- Design, implementation and execution of FAT scripts in accordance with assurance procedures used for Release 1.2; and
- Achieving PIT complete status and subsequent reporting.

4.3 Systems Integration Testing

Systems Integration Testing (SIT) is the testing of DCC's Total System, which brings together the component parts of DCC's System (e.g. DSP and CSP Systems) to allow testing of the end-to-end solution by DCC. The SIT activity is done for every DCC System release and incorporates the test and integration of multiple changes.

Additional SIT is recommended by DCC for a modification of this type. It should however be noted that the scope of SIT is likely to be more focused on regression testing to confirm that the changes applied as part of this modification have not had an impact on the wider DCC Total Systems.

Suggested SIT scope would at a high level typically include:

- System Test script and data design;
- Data generation and loading into a co-ordinated System Test environment;
- Execution of System Tests through sufficient iterations to enable SIT complete.

4.4 User Integration Testing

User Integration Testing enables Users to run specific tests to support their implementation of a change.

DCC expects that User Integration Testing will be required in order to support User implementation of this modification.

Individual changes are collected into a DCC release. In order to achieve more efficient User Integration Testing for all parties, the DCC will coordinate specific testing requirements for all changes that comprise a release and issue a testing release approach document.

5 Implementation Timescales and Releases

5.1 Change Lead Times

From the date of approval, (in accordance with Section D9 of the SEC), in order to implement the changes proposed DCC requires a lead time of: **12 months.**

This includes twelve months as stated in the DCC Release Management Policy plus an additional one month to allow for integrated release planning. Integrated release planning can only begin once all Authority Determinations have been received for all modifications proposed to be included within each Release.

6 DCC Costs and Charges

6.1 Cost impact

6.1.1 Implementation costs

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

Implementation costs							
Implementation Phase:	**Design**	**Build**	**Pre-Integration Testing**	**System Integration Testing**	**User Testing**	**Implementation to Live**	**Total**
SECMOD007	*Between £7,300,000 and 8,200,000*			*TBD in full IA*	*TBD in full IA*	*TBD in full IA*	**£7,300,000 - £8,200,000**

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.*
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.*

The fixed price cost for a Full Impact Assessment is **£346,442**.

6.1.2 On-going operational costs

The table below details the additional cost associated with the on-going operation of the new Systems or Services introduced through this Modification Proposal.

6.2 Impact on Charges

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

DCC notes that SECMP 0007 does not propose any changes to the charging arrangements set out in SEC Section K. DCC has made the assumption that, in the absence of an agreed alternative arrangement by the Working Group, the costs associated with the implementation of SECMP 0007 will be allocated to DCC's fixed cost based and passed through to Parties via Fixed Charges.

Subject to the commercial arrangements put in place to support the relevant Release, DCC expects the increase in Charges associated with the implementation of SECMP 0007 to commence in the month following the modification's implementation.

7 RAID

The detail below provides a summary of the risks, assumptions, issues, dependencies and clarifications observed during the production of a DCC Impact Assessment. DCC requests that the Working Group consider this section and consider any material matters that have been identified during this Impact Assessment phase. Any changes may impact the proposed solution, implementation costs and/or implementation timescales.

7.1 Risks

Ref	Risk Description	Probability	Impact
CSP network capacity and CH hardware	The ability to deliver firmware updates to IHDs and PPMIDs could be limited by the capacity of the CSP network (especially for Arqiva) and by the CH hardware. DCC sees the following factors are preventing the CSPs from being able to confirm that their networks will be able to support the requirements: • Non-functional requirements and usage scenarios are not defined to the level that would be needed to proof that networks and CHs are fit for purpose • Usage scenarios from mod 24 could influence this solution, and vice versa	medium	high

7.2 Assumptions

DCC would like to confirm the validity of assumptions listed below with the Working Group. These assumptions have been used in the creation of this DCC Impact Assessment. Any changes to the assumptions may require DCC to undertake further assessment, prior to the contracting and implementation of this change. Any changes may impact the proposed solution, implementation costs and/or implementation timescales.

Ref	Description	Assumption Accepted
A-001	It is assumed that the DSP should keep track of which individual PPMIDs and IHDs have upgradeable firmware and block firmware upgrade requests to older devices which cannot support upgrades. GBCS version information will be used for IHDs where it is available, however the DSP does not currently record firmware version for IHDs and in such cases the IHD will be assumed to have non-upgradeable firmware. For any cases where IHDs already in the inventory before the DSP release are later-model devices which actually do have upgradeable firmware, suppliers would be able to use SR8.4 Update Inventory to change the inventory firmware version of the IHD, which would be permitted in such cases.	TBC
A-001	It is assumed that the DSP should keep track of which individual PPMIDs and IHDs have upgradeable firmware and block firmware upgrade requests to older devices which cannot support upgrades. GBCS version information will be used for IHDs where it is available, however the DSP does not currently record firmware version for IHDs and in such cases the IHD will be assumed to have non-upgradeable firmware. For any cases where IHDs already in the inventory before the DSP release are later-model devices which actually do have upgradeable firmware, suppliers would be able to use SR8.4 Update Inventory to change the inventory firmware version of the IHD, which would be permitted in such cases.	TBC
A-002	If a CPL update removes validity for an IHD firmware version, IHDs using it cannot be suspended since IHDs do not have device status. The effect of the CPL removing validity would be that new pre-notifications or firmware upgrades for that firmware version would be blocked, but devices already using it would not be affected.	TBC

Ref	Description	Assumption Accepted
A-003	We understand that it is expected that a single physical device may contain PPMID, IHD and CAD functionality, with a single device ID. It is assumed that in this case the device model would be identified on the CPL as a PPMID, and correspondingly an individual device would be pre-notified as a PPMID. The inventory would store a record of the device as a PPMID, and would have no record of the existence of the IHD or CAD functionality of the device. Any firmware update would be just to the PPMID, again with no separate identification of the IHD.	TBC
A-004	It is assumed that no change is required to CPL processing in order to handle firmware updates which are split across 2 or more images. Each will have a separate CPL entry with a unique firmware version ID and hash for that particular fragment, and there will be no identification in the CPL or the DSP database that the firmware versions are components of a multi-part firmware version.	TBC
A-005	The CPL will contain no more than one entry for a particular firmware version. If a firmware version is compatible with more than one GBCS version it will be reported in the CPL for only one of them.	TBC
A-006	Where delivery of a firmware image has failed and the comms hub sends a device alert to the ACB, there will be no attempt by the CSP or DSP to retry delivery. It will be the supplier's responsibility to re-request delivery.	TBC
A-007	Anomaly detection volume thresholds will apply to the new service requests and will be mandatory for SR11.4 (in a similar way to SR11.1).	TBC
A-008	The DSP will not manage state of requests in flight, e.g. if an EIS and a GIS send firmware updates for the same device at about the same time, the DSP is not required to prevent that situation and will simply forward valid requests as they are sent.	TBC

Ref	Description	Assumption Accepted
A-009	The new DCC Alert which is to be sent to suppliers when firmware for a PPMID or IHD is successfully activated or downloaded will go to all interested suppliers. In the case where it indicates successful download of part of a multi-part firmware update, the SECAS information appears to suggest that the firmware successfully downloaded will not be identified in the device alert which is sent (as only the currently active version will be sent). This means that if 2 suppliers are trying to upgrade firmware for the same IHD or PPMID at about the same time, the DCC Alert will not enable the suppliers to realise that it might not be their own firmware image which was successfully downloaded.	TBC

7.3 Issues

Ref	Issue Description	Severity	Priority
None Identified	**n/a**	n/a	n/a

7.4 Dependencies

Ref	Dependency	Dependency Accepted
None identified	**n/a**	n/a

7.5 Clarifications Required

Ref	Dependency	Status
None identified	**n/a**	n/a