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Paper Reference:	**TABASC_54_0406_07**	Corporate member of Plain English Campaign Committed to clearer communication 592
Action:	**For Recommendation**	

SECMP0024 'Enduring approach to Communications Hub firmware management'

1. Purpose

SECMP0024 'Enduring Approach to Communication Hub Firmware Management' is currently undergoing the Refinement Process. The Data Communications Company (DCC) has provided its Preliminary Assessment against two solution options. We seek any comments and feedback from the Technical Architecture and Business Architecture Sub-Committee (TABASC) on these, and a view on which solution option it would recommend taking forward.

This paper provides a high-level summary of the key points. The DCC Preliminary Assessment can be found in Appendix A.

2. Summary of the Proposal

What is the issue?

The Proposer (E.ON) highlights the lack of a process for managing firmware updates to Communications Hubs (CHs). Because of this, the Proposer believes that there is currently a significant risk that a CH firmware update with defects or interoperability issues could be deployed and activated to significant numbers of CHs. This could create a range of issues arising from a DCC deployed CH firmware update occurring concurrently with:

- A programmed configuration change to a Supplier's smart metering Device e.g. a Change of Supplier (CoS) event, price change, or tariff change;
- A Supplier's scheduled firmware deployment to a smart metering Device;
- Historical consumption data being uploaded to Supplier systems on behalf of the consumer; or
- A consumer attempting to interface with the Smart Metering System (e.g. a delay in a prepayment top-up), leading to a poor customer experience.

What is the proposed solution?

To mitigate these issues, the Proposer seeks to develop and implement an agreed enduring process for the deployment and activation of CH firmware updates. This would see Suppliers being informed by the DCC when CH firmware updates are available and allow them to specify the date and time, within a period defined by the DCC, when these are deployed. The requirements and specifications for this process include two solution options that have been assessed by the DCC:

1. Use of Service Requests on the DCC User Interface Specification (DUIS) Interface; and
2. Use of a DCC operated Web Portal.

The suggested solution (Option 1) has been drafted taking SECMP0007 'Firmware updates to IHDs and PPMIDs' into account and establishes the framework for firmware upgrades to Devices in a dual Supplier scenario; solution (Option 2) could be expanded to support SECMP0007.

The Proposer does not suggest that the responsibility for CH firmware management be transferred to Suppliers. This modification is intended only to enhance the firmware deployment and activation process by allowing Suppliers to manage the time any updates are deployed by the DCC in order to mitigate the Proposer's identified risks. This would be to the benefit of the DCC, Suppliers, and ultimately consumers.

3. DCC Preliminary Assessment

Option 1: CH Firmware Update Management with Service Request

The general principle behind Option 1 is to allow Service Users to share relevant data in support of the CH firmware management process via Service Requests. The success and failure of any processing stage could be communicated back to the Service Users via either DCC Alerts or emails.

Machine to machine communication interfaces will be used to share data between Communications Services Providers (CSPs), Data Services Provider (DSP) and the DCC. The existing data communication patterns will be employed for most of these. However, for the DCC to send data to the DSP, a new inbound Enterprise Systems Interface (ESI) interface will be introduced. This will require security review and approval.

Option 2: CH Firmware Update Management via Web Portal

Option 2 is the Web Portal based solution and will be built using the existing Self-Service Interface (SSI)/ Self Service Management Interface (SSMI) suite. The SSI and SSMI will be updated to provide new interfaces to manage all stages of the CH firmware update process. The DCC solution would be modelled according to the Hypercare[1] project and would use a web-portal type interface for Suppliers. This portal will not require Service Requests.

Additional functionality will be required to replace the spreadsheets used currently with Hypercare and move to an interface similar to that of the SSI. Notifications and alerts would then be managed via the web-portal.

[1] Hypercare is an interim solution which provides DCC Users with the opportunity to approve CH upgrades.

4. Costs

Breakdown of DCC costs		
Solution option	**Cost up to Pre-Integration Testing (PIT)**	**Cost for a full Impact Assessment**
Option 1	£2.7 – £3.7 million	£195,000
Option 2	£1.9 – £2.7 million	£188,000

5. Recommendations

The TABASC is requested to:

- **CONSIDER** the DCC Preliminary Assessment and provide any comments or feedback on these; and
- **RECOMMEND** which of the two solution options it believes should be progressed.

Joe Hehir

SECAS Team

26 March 2020

Attachments:

- **Appendix A:** SECMP0024 DCC Preliminary Assessment
- **Appendix B:** SECMP0024 business requirements

Data Communications Company

SEC Modification Proposal, SECMP0024

Enduring Approach to Firmware Management

Preliminary Impact Assessment (PIA), DCC CR 1162

Version:	**0.34**
Date:	**20th February 2020**
Author:	**DCC**
Classification:	**DCC PUBLIC**

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1 Document History

1.1 Revision History

Revision Date	Revision	Summary of Changes
03/11/2019	0.1	Compilation from Service Providers, requested changes
20/02/2020	0.34	Internal review and revision by DCC

1.2 Associated Documents

This document is associated with the following documents:

Ref	Title	Source	Issue Date
1	Business Requirements Proposal v0.41	DCC	25 March 2019

1.3 Document Purpose

The purpose of this Preliminary Impact Assessment (PIA) is to provide the relevant Working Group with a counter proposal for refining the business requirements associated with both option of this modification.

1.4 Previous Document Information

The original Proposer for this Modification was Rob Williams.

The Preliminary Impact Assessment was requested of DCC in May 2019.

2 Introduction

This Modification seeks to amend the Smart Energy Code (SEC) and DCC's systems to enable a process and systems support for coordination of firmware upgrades of end devices on the smart metering system

2.1 Context

This Modification would reduce the risk of Communications Hub (CH) firmware updates causing issues with supplier installations of metering equipment in terms of both financial measurements and customer experience (within the premises and in billing/settlements).

The ability of a supplier to provide input into the scheduling of CH firmware updates would:

- Reduce the risk of large-scale corrective action and remediation following inappropriate deployment and activation of firmware to significant numbers of CHs
- Reduce the risk of impact to consumers through issues related to CH firmware performance issues
- Reduce the risk of large-scale interoperability issues
- Allow DCC and suppliers to monitor and provide feedback on successes and failures
- Reduce financial expenditure on meter technician visits to resolve interoperability issues
- Assist the journey to technical excellence in the SMIP program
- Reduce the risk of reputational damage to the SMIP

Customers would benefit from:

- A more reliable customer journey with minimal disruption caused by meter technician visits to resolve interoperability issues
- Increased customer confidence in the SMIP program

2.2 Original High Level Business Requirements

The original high level business requirements for this Modification are included in Appendix A; Original High Level Business Requirements on page 21. However after discussions with the Service Providers and Working Group, the process and solution implied by the Business Requirements were agreed as not being viable due to the technical constraints of the Communication Service Provider (CSP) solutions, whereby the distribution of firmware must be considered within and subject to each CSP's network capacity planning processes such that utilisation is optimised.

2.3 Firmware Management Proposals and Requirements

An extensive Communication Hub Firmware Management Consultation led by the DCC and including the Service Providers and their suppliers was carried out in 2018-19, and recommendations on the requirements and potential solutions to firmware management and distribution were made.

At the Modification Working Group on 25th February, 2019, it was agreed that requirements derived from the consultation and subsequently refined in workshops with the Service Providers would be used for SECMP0024. The requirements are contained in the following attached document:

SECMP0024 BRS0.43.docx

2.4 Firmware Management Process Overview

Based on the discussions at the Working Group and the Business Requirements as set out in the Solution Design Document, this Modification includes a view of the technical constraints the business requirements account for, as well as a proposal on the high level process that can work within the technical constraints of the CSP solution.

In order to provide Energy Suppliers with some control over CH firmware updates, the following new firmware management process is proposed. The activities involved in the proposed Comms Hub firmware management process will be managed in four process stages as described below.

2.4.1 Notification

The first stage in the firmware management process consists of DCC sending notifications to the Service Users when a new firmware version is available for roll out.

2.4.2 Piloting

During the piloting phase, Service Users will be allowed to select a pilot group of Comms Hubs for the new firmware version to be deployed to and a schedule for deployment.

The CSPs will prepare an initial 'Default Pilot List' of Comms Hubs and a 'Default Pilot Schedule'; both will be shared with the Service Users. The Service Users will then able to share their 'Preferred Pilot List' and 'Preferred Pilot Schedule' with the CSPs and DCC. The ‘Preferred’ lists and schedules will be used for the pilot group deployment. In a split Supplier scenario, both the Import and Gas Suppliers’ ‘Preferred’ lists and schedules need to be coordinated.

The firmware upgrade will be deployed. Existing firmware management procedures will be used to track progress and to report on the status of the firmware upgrade at an individual Comms Hub level.

At the end of the Pilot phase, DCC will share the overall success or failure of the deployment with all the relevant parties.

2.4.3 Safe Launching

After the piloting phase, the Service Users will be provided with a Safe Launch schedule by the DCC.

DCC will report on the status of Safe Launch deployments to all the relevant parties.

2.4.4 Closure

At the end of the firmware version roll out, DCC will send notifications to all the relevant parties to inform them about the rollout closure and the completed firmware upgrade.

3 Description of Solution Options

It should be noted that both of the proposed solution options would allow Suppliers to carry out firmware upgrades at different times via scheduling, rather than all together, and the entire process could be voluntary until there was a need for a compulsory firmware upgrade.

3.1 Option 1: CH Firmware Update Management with Service Request

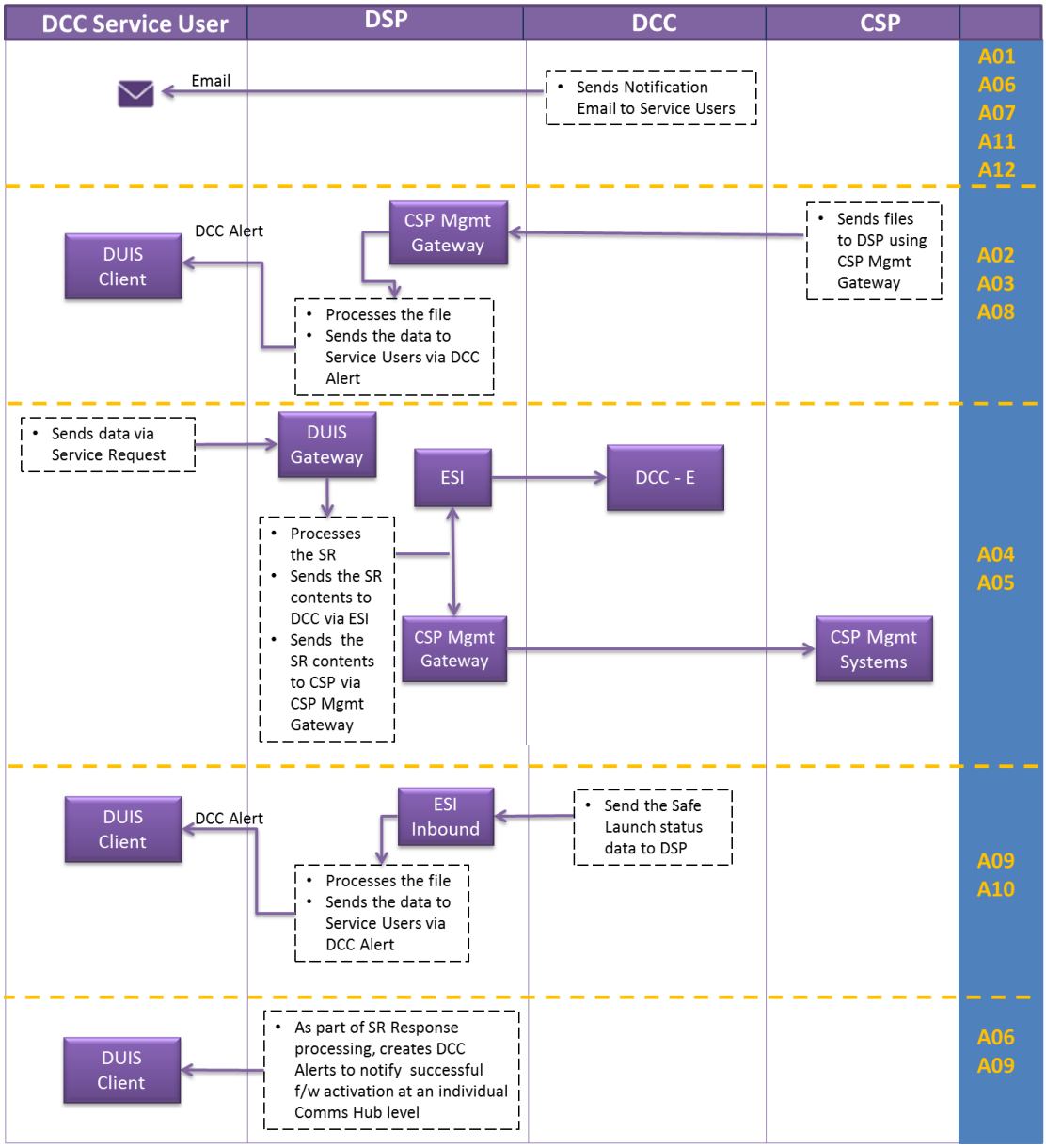
The general principle behind Option1 is to allow Service Users to share relevant data in support of the Comms Hubs firmware management process via Service Requests. The success and failure of any processing stage could be communicated back to the Service Users via either DCC Alerts or emails.

Option 1 has been considered against the below table of interactions.

Process Outline							Process Area			
Action	**ID**	**Initiating Actor**	**Receiving Actor**	**Initiating Mechanism**	**Receiving Mechanism**	**Granularity**	**Notifying**	**Piloting**	**Safe Launching**	**Closing**
Initial Notification	A01	DCC-L	Service Users	Email	Email		x			
Default Pilot List	A02	CSPs	Service Users	File Upload	DCC Alert	GUIDs		x		
Default Pilot Schedule	A03	CSPs	Service Users	File Upload	DCC Alert	Groups of GUIDs		x		
Preferred Pilot List	A04	Service Users	CSPs, DCC-L	Service Request	Report	GUIDs		x		
Preferred Pilot Schedule	A05	Service Users	CSPs, DCC-L	Service Request	Report	Groups of GUIDs		x		
Notify Pilot Success	A06	DCC-L	Service Users	Email	Email	Process Level		x		
Notify Pilot Failure	A07	DCC-L	Service Users	Email	Email	Process Level		x		
Safe Launch Schedule	A08	CSPs	Service Users	File Upload	DCC Alert	Groups of GUIDs			x	
Notify Safe Launch Success	A09	DCC-L	Service Users	File Upload	DCC Alert	Process Level			x	
Notify Safe Launch Failure	A10	DCC-L	Service Users	File Upload	DCC Alert	Process Level			x	
Notify Closure	A11	DCC-L	Service Users	Email	Email	Process Level				x
Notify Supersession	A12	DCC-L	Service Users	Email	Email	Process Level				x

Machine to machine communication interfaces will be used to share data between CSPs, DSP and DCC. The existing data communication patterns will be employed for most of these. However, for DCC to send data to DSP, a new inbound ESI interface will be introduced. This will require security review and approval.

A set of high-level interaction patterns have been identified, showing the parties involved in a processing flow, the originator and the target systems. The diagram below shows these patterns and the associated interactions.



The following data flows require CSPs to send data to the Service Users:

- A02 Default Pilot List;
- A03 Default Pilot Schedule;
- A08 Safe Launch Schedule.

DSP will provide new interfaces in the CSP Management Gateway for the CSPs to submit the required data related to the data flows above. The received data will be forwarded to the Service Users via DCC Alerts.

The DCC Data Systems will be updated to provide two new Service Requests for the Service Users to send their Preferred Pilot List (A04) and the Preferred Pilot Schedule (A05) to the CSPs and to DCC. The data received as part of these SRs will be forwarded by DSP to both the CSPs and the DCC via CSP Management Gateway and the ESI respectively.

In order for DCC to send the data related to the success and failure of the Safe Launch phase (A09, A10), DSP will build a new ESI inbound interface. The data received by DSP will be sent to the Service Users via DCC Alerts.

The process level success notifications are initiated by DCC for the Piloting and Safe Launching stages (A06, A09).

DSP will send a new DCC Alert to the Service Users for each successful firmware activation at an individual Comms Hub level. The existing SR Response processing will be updated to include the new Alert.

3.1.1 DSP Impacted Components for Option 1

The following components will be impacted by Solution Option 1:

- DUIS/DUGIDS
  - New Service Requests will be created to handle the Preferred Pilot List and Preferred Pilot Schedule data
  - New DCC Alerts will be created to send the notifications to the Service Users
- Request Management Functionality will be added to:
  - Process the new Service Requests
  - Implement the associated validations
  - Implement the new DCC Alerts
- ESI
  - A new ESI inbound interface will be created to receive files from DCC
  - Functionality will be added to support the sending of new data extracts to DCC
- CSP Management Gateway
  - New interfaces will be added to send and receive data from CSP

3.2 Option 2: CH Firmware Updates Management via Web Portal

Option 2 is the **Web Portal** based solution for CR1162 and will be built using the existing SSI/SSMI suite. SSI and SSMI will be updated to provide new interfaces to manage all stages of the Comms Hub firmware update process. The DCC solution would be modelled according to the Hypercare project and would use a web-portal type interface for Suppliers. This portal would not require Service Requests, which is a considerable difference to the Option 1 above.

There would be a pilot phase to ensure Suppliers were in control deciding which of their customers would be upgraded and when, protecting those at risk such as vulnerable customers to ensure they were not part of any early deployments. There would also be split-Supplier approvals whereby Suppliers could use the interface to see where one Supplier has approved an upgrade to the Communication Hub and react as appropriate, without disclosing details of the Suppliers to each other.

Additional tooling will be required to replace the spreadsheets used currently with Hypercare and move to an interface similar to that of the Self-Service Interface (SSI). Notifications and alerts would then be managed via the web-portal.

Option 2 has been considered against the below table of interactions:

Process Outline						Process Area			
Action	**Initiating Actor**	**Receiving Actor**	**Initiating Mechanism**	**Receiving Mechanism**	**Granularity**	**Notifying**	**Piloting**	**Safe Launching**	**Closing**
Initial Notification	DCC-L	Service Users	SSMI Initiate Process	SSI Dashboard		x			
Default Pilot List	CSPs	Service Users	SSMI Pilot Mgmt	SSI Pilot Mgmt	GUIDs		x		
Default Pilot Schedule	CSPs	Service Users	SSMI Pilot Mgmt	SSI Pilot Mgmt	Groups of GUIDs		x		
Preferred Pilot List	Service Users	CSPs, DCC-L	SSI Pilot Mgmt	SSMI Pilot Mgmt	GUIDs		x		
Preferred Pilot Schedule	Service Users	CSPs, DCC-L	SSI Pilot Mgmt	SSMI Pilot Mgmt	Groups of GUIDs		X		
Notify Pilot Success	DCC-L	Service Users	SSMI Pilot Mgmt	SSI Pilot Mgmt	Process Level		X		
Notify Pilot Failure	DCC-L	Service Users	SSMI Pilot Mgmt	SSI Pilot Mgmt	Process Level		X		
Safe Launch Schedule	CSPs	Service Users	SSMI SafeLaunch Mgmt	SSI Safelaunch Mgmt	Groups of GUIDs			x	
Notify Safe Launch Success	DCC-L	Service Users	SSMI SafeLaunch Mgmt	SSI Safelaunch Mgmt	Process Level			x	
Notify Safe Launch Failure	DCC-L	Service Users	SSMI SafeLaunch Mgmt	SSI Safelaunch Mgmt	Process Level			x	
Notify Closure	DCC-L	Service Users	SSMI Closure	SSI Dashboard	Process Level				x
Notify Supersession	DCC-L	Service Users	SSMI Closure	SSI Dashboard	Process Level				x

This solution would be built using the existing SSI/SSMI suite. SSI and SSMI will be updated to provide new interfaces to manage all stages of the Comms Hub firmware update process. The new functionality will be organised as follows:

1. CH Firmware Update Initiation;
2. CH Firmware Piloting;
3. CH Firmware Safe Launch;
4. CH Firmware Update Closure.

Note that the Web Portal based solution expects all the interactions to be handled via the User Interfaces; there will be no support for machine-to-machine interfaces.

This solution enables DCC to create all the notifications targeted at the Service Users (A01, A06, A07, A09, A10, A11, A12) within SSMI, which will then be accessed by the Service Users via SSI.

New SSMI interfaces will be provided to CSPs for the uploading of Default Pilot List (A02), Default Pilot Schedule (A03) and Safe Launch Schedule (A08), which will then be made available to the

Service Users via SSI. It shall be noted that SSMI currently does not provide file upload interfaces to the CSPs. This introduces a new processing pattern and will require security review and approval.

New SSI interfaces will be built for the Service Users to upload their Preferred Pilot List (A04) and the Preferred Pilot Schedule (A05), which will be made available at SSMI for the CSPs and the DCC to access. SSI currently does not provide a file upload interface to the Service Users and therefore this will also require security approval.

The following diagram shows an overview of the process flow for the interactions identified in Table 1, for solution Option 2.

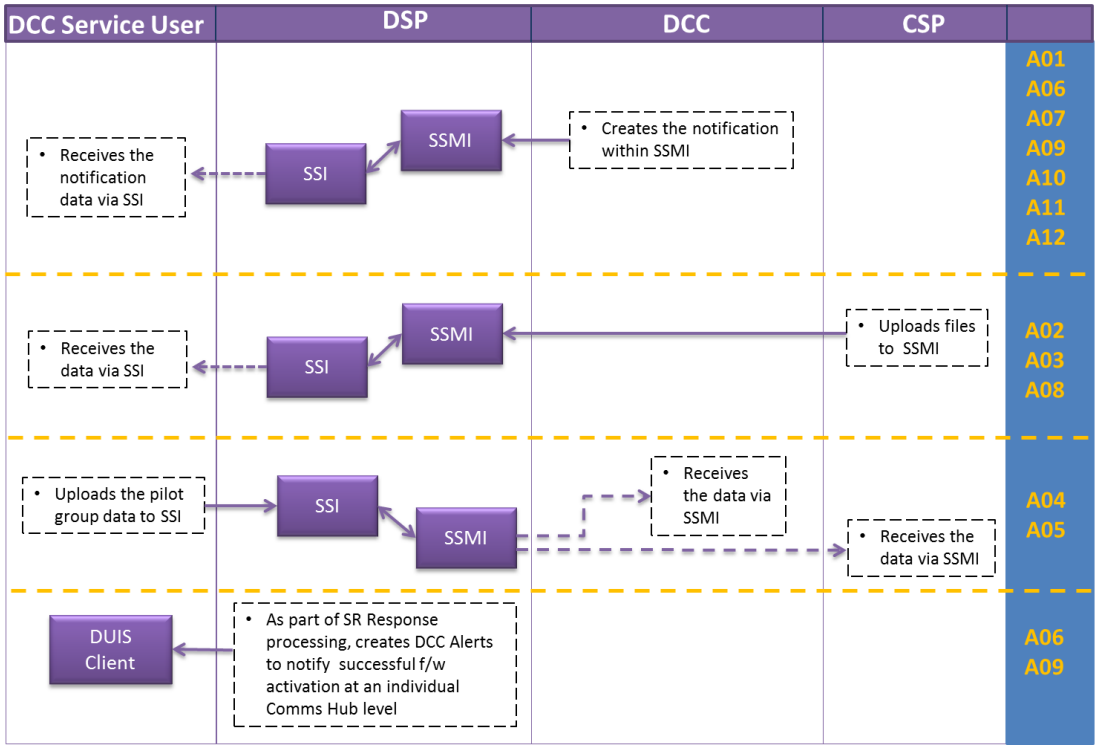


Figure 1 Interaction Patterns - Web Portal

The overall success notifications for the piloting and safe launching stages will be created by DCC using SSMI (A06, A09). For the successful firmware activation at an individual Comms Hub level, DSP will create a new DCC Alert to notify the Service Users.

This PIA assumes that the files shared between the parties as part of the firmware update management process will not require signing. DSP understands that this may change depending on what integrity checks the CSPs would like to enforce.

3.2.1 DSP Impacted Components for Solution Option 2

The following components will be impacted by Solution Option 2:

- DUIS/DUGIDS
  - DCC Alerts will be created to notify firmware activation at a device level
- Request Management Functionality will be added to:
  - Implement the new DCC Alerts scenarios
- SSI

- Build new user interfaces for Service Users to receive notifications and files shared by DCC and the CSPs.

- SSMI
  - Build new user interfaces for DCC to create notifications, upload files and receive files.
  - Build new user interfaces for CSPs to send and receive files.

3.3 Constraints

Process Action	Constraint
General	• With respect to firmware distribution, a primary concern for both CSPs is managing scarce bandwidth on their networks • When distributing firmware, CSPs must take into account geographical distribution of devices as well as network activity at the point in time where firmware must be distributed • The process of upgrading CH firmware requires a high degree of manual intervention due to the above constraints • Because the CSPs need to actively manage the process of CH firmware upgrades, the CSPs largely need to remain in control of the scheduling and grouping of CH firmware upgrades
Initial Notification	• No constraint
Default Pilot List	• CSPs have an interest in ensuring that the groups of CH's selected for piloting a new firmware deployment are large enough to ensure a valid sample • CSP's also have the knowledge of which CH's are suitable for pilot deployments • It would make sense therefore for CSP's to build the initial pilot deployment lists and allow the Service Users to make amendments as necessary
Default Pilot Schedule	• Given the constraints noted in the General section above, it makes sense for the CSP's to notify a period of time in which a pilot would be deployed
Preferred Pilot List	• Given the above notes around 'Default Pilot List', we believe it makes sense for Service users to specify amendments to the default list
Preferred Pilot Schedule	• Given the constraints noted above, we believe it makes sense for Service users to be able to request amendments to the pilot deployment schedule, but the final say needs to remain with the CSPs. • This constraint is largely driven by the need for CSP's to maintain a consistent demand profile on the personnel managing firmware deployment
Notify Pilot Success	• No constraint
Notify Pilot Failure	• No constraint

Safe Launch Schedule	• Constraints around scheduling of a safe launch are primarily related to the technical constraints noted in the general section as well as the constraint noted in 'Preferred Pilot Schedule' around CSP's needing to manage demand on the personally managing firmware deployments. • Given the volume of upgrades and the need to optimise deployment schedules around technical constraints of the networks, we don't believe it is possible to offer Service Users a system driven facility to request changes in the scheduling of a safe launch. That is not to say that exceptional circumstances could not be managed off system
Notify Safe Launch Success	• No constraint
Notify Safe Launch Failure	• No constraint
Notify Closure	• No constraint
Notify Supersession	• No constraint

4 Impact on DCC's Systems, Processes and People

This section describes the impact of SECMP0024 on the DCC Total System services and interfaces that impact Users and/or Parties.

This PIA assumes that there are no requirements for DSP to split the Comms Hubs data received from CSPs based on the Suppliers of that premise. Any such requirements will need further elaboration of scope and shall be considered during the Full Impact Assessment stage.

4.1 Security Impact

The implementation will be security assured during the implementation phase. This includes reviewing designs, test artefacts and providing consultancy to the implementation and test teams.

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

4.2 Infrastructure Impact

There will be no change to the infrastructure design as a result of this change. No material impact on system performance is expected.

The change does not impact the DSP resilience or DR implementation.

It will be necessary to deploy the revised DUIS schema to Data Power devices.

4.3 Integration Impact

The functionality will need to be validated in both the SIT and UIT environments and will require integration testing which involves both DSP and CSPs as a minimum. It is assumed that this Modification will be integrated as part of a wider release with other changes and that the costs of regression testing will be covered through a Release Change Request.

4.4 Service Impact

This Modification introduces new interfaces and business processes within the DCC Data Systems. It is possible that the expansion of the functionality will result in some additional queries and issues for the DSP Applications Management Support team to resolve. As such, the Operational Service will require an uplift in order to support and maintain the solution. The impact will be assessed further as part of the FIA.

5 Implementation Timescales

The timescales for the implementation of the change will be determined via the Full Impact Assessment.

5.1 Implementation Approach

Implementation of this change is assumed to follow a waterfall methodology. The release lifecycle duration will be confirmed as part of the FIA.

5.2 Testing and Acceptance

This change includes the standard test phases as documented in schedule 6.2 and it is assumed that the change will be implemented and tested as part of a major release and will include release-based regression testing in SIT and UIT.

6 Costs and Charges

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

The scope of supply under this PIA includes design, development (build), system testing, and unit testing within the PIT environments.

The Rough Order of Magnitude cost (ROM) shown below describes indicative costs to implement the functional requirements as assumed above. The price is not an offer open to acceptance. It should be noted that the change has not been subject to the same level of analysis that would be performed as part of a Full Impact Assessment and as such there may be elements missing from the solution or the solution may be subject to a material change during discussions with the DCC. As a result, the final offer price may result in a variation.

6.1 Design, Build, and Testing Cost Impact

The table below details the cost of delivering the changes and Services required to implement this Modification. For a PIA, only the Design, Build and PIT indicative costs are supplied.

£	Design, Build and PIT	SIT	UIT	TTO	App. Support	SP Total
Option 1	£2.7 – 3.7 million	n/a	n/a	n/a	n/a	£2.7 – 3.7 million

£	Design, Build and PIT	SIT	UIT	TTO	App. Support	SP Total
Option 2	£1.9 – 2.7 million	n/a	n/a	n/a	n/a	£1.9–2.7million

Design	The production of detailed System and Service designs 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. It includes Unit Testing (also referred to as System Testing), Performance Testing and Factory Acceptance Testing by the Service Provider or supplier.
Pre-Integration Testing (PIT)	Each Service Provider tests its own solution to agreed standards in isolation of other Service Providers. This is assured by DCC. This phase also includes regression testing across all Comms Hub products
Systems Integration Testing (SIT)	All the Service Providers PIT-complete solutions are brought together and tested as an integrated solution, ensuring all SP solutions align and operate as an end-to-end solution. The System Integrator is responsible for leading this phase with the Service Providers offering testing support services.
User Integration Testing (UIT)	Users are provided with an opportunity to run a range of pre-specified tests in relation to the relevant change. The DCC is responsible for leading this phase with the Service Providers offering testing support services.

Implementation to Live (TTO)	The solution is implemented into production environments and ready for use by Users as part of a live service. The Transition to Operations (TTO) service is subject to implementation costs.
Application Support	Any costs associated with supporting the new functionality.

The fixed price cost for a Full Impact Assessment is:

£194,937.13 for Option 1; or

£187,599.76 for Option 2

and would be expected to be completed in 30 days.

7 Risks, Assumptions, Issues, and Dependencies

In the following sections, Risks, Assumptions, Issues, and Dependencies have been identified.

It is possible that further RAID will be established as part of the Working Group reviews and the FIA.

7.1 Risks

Ref.	Area	Description	Recommended action
MP24-RA01	System Upgrades	The introduction of this Modification is likely to result in a reduction in the speed at which the DCC ecosystem can be upgraded both to resolve defects and to add features. As such, there is a risk that this could affect the perceived value of the DCC solution. DCC is concerned that neither the solution presented in this Modification, nor the development of industry capabilities to assure meter interoperability will provide suitable assurance to Service Users that DCC releases will not affect communications to or interoperability with Service User provided meters. DCC has concerns in the following areas: • The progress being made in establishing an interoperability testing organisation via the SMDA; • Any definition of how the DCC and its Service Providers will interact with the interoperability testing to support DCC interoperability assurance.	Plan in fixed periods of Service User testing prior to Go Live for releases to increase Service User confidence in the solution.
MP24-RA02	Update Content	There is a risk that the existing development methods to bundle defect fixes together may result in functional defect fixes being included with either security or operational fixes and as such, bypassing any process introduced in this Modification. This may introduce a perceived interoperability risk to Service Users that this Modification seeks to mitigate as DCC deploy an urgent security update that has been developed against the latest Production software	

		release, as opposed to the software release currently active on a Communication Hub.	
MP24-RA03	Maintain Connectivity	There is a risk that the introduction of a process within this Modification does not provide the Service Users with adequate confidence that a Production Communication Hub firmware upgrade will maintain connectivity and service to their meters.	Agree that a small sub-set of Comms Hubs are excluded from the 'pilot' for every release. The number of Communication Hubs to be excluded would in each case be fewer than one hundred (100) in total and would serve to prove the viability of Communication Hub software interaction with Service User selected meters within consumer premises. This would not replace any non-Production testing. Agree friendly customer with Service Users for early targeting of Communication Hub firmware upgrades to expedite the first Service User approvals.
MP24-RA04	Bypass Pilot Scheme	There is a risk that that Communication Hubs that are agreed by one Service User to bypass the 'pilot' process subsequently change Supplier to another Service User. In this situation DCC will have been permitted to bypass the 'pilot process by a Service User that is no longer responsible for the HAN associated with the Communication Hubs.	Accept
MP-RA05	Constraints	There is a risk that any constraints that Service Users request as part of the 'preferred pilot schedule' are not compatible with the approach and resourcing that CSPs arrange to support the 'default pilot schedule'.	As noted in MP24-AD08, produce and agree with Service Users and CSPs a list of valid scheduling constraints that Service Users may select to produce their 'preferred pilot schedule'.

7.2 Assumptions

Ref.	Area	Description	Accept
MP24-AD01	Testing	Testing for this Modification will be delivered via the B stream of test environments.	
MP24-AD02	Deployment	A single Release CR will be raised to support deployment of this and all other candidate changes for the selected release.	
MP24-AD03	Process	DCC assumes that: - a 'pilot deployment period' may last up to six (6) months however a 'pilot deployment period' of one to two months will be typical;	

		- the 'pilot deployment period' duration will be determined by DCC; - a 'pilot deployment period' will be optional for a release; - a 'pilot deployment period' will not be used for operational or security impacting releases; - any Hypercare period for a specific Communications Hub firmware release will begin at the point that the relevant CSP raises the first Operational Change Release that seeks to deploy that specific Communication Hub firmware release	
MP24-AD04	Service Levels	There will be no additional Performance Measures or Service Levels as part of this Modification.	
		-	
MP24-AD05	Process	DCC will maintain a list of 'friendly customers' in agreement with Service Users for the purposes of identifying potential early Communication Hubs for upgrade.	
MP24-AD06	Tooling	DCC will re-use existing file specifications where appropriate in relation to the communication of lists of Communication Hubs.	
MP24-AD07	Process	DCC will create a set of valid constraints that Service Users may request in their 'preferred pilot schedule' such that only constraints that are compatible with each CSP's 'default pilot schedule' are requested.	
MP24-AD08	Tooling	There is no need / benefit to the introduction of a fixed file format for the 'default pilot schedule' or the 'preferred pilot schedule' given that: - neither schedule is expected to be at a GUID level; - the 'default pilot schedule' is to be treated as an informal reasonable endeavours service level agreement rather than a granular plan.	
MP24-AD09	Process	The following obligations will be placed on Service Users: - all Service Users must participate with a pilot; - all Service Users must contribute at a minimum number of Communication Hubs to the pilot, noting that DCC may look to agree rules with larger suppliers rather than all suppliers to limit complexity; - all Service Users that participate in the pilot must provide at least x% of their Communication Hubs within the first two months of the pilot. - In the event that Service Users do not provide Communication Hubs within the first two months of any pilot, DCC will select hubs on the Service Users' behalf.	
MP24-AD10	Scope	Production proving Communication Hubs will be included in the pilot and added to the 'preferred pilot list' by DCC.	
MP24-AD11	Tooling	DCC will define and arrange for an enhanced monitoring process for any Communication Hub enrolled in a 'pilot' to	

		provide additional visibility of Communication Hub performance to Service Users and DCC.	
MP24-AD12	Process	A 'safe launch' will be automatically triggered at the end of the pilot phase unless the Communication Hub firmware is withdrawn from the CPA.	
MP24-AD13	Process	Where approval is received for a Communication Hub firmware deployment for a release where the previous release is still in a 'pilot' phase then this shall serve to invalidate the 'pilot' phase of the previous release.	
MP24-AD14	Scope	One option will be selected to progress to FIA.	

7.3 Issues

None at this time.

7.4 Dependencies

Ref.	Area	Dependency	Impact
MP24-DD01	Process	Any scheduling requests that relate to a set of Communication Hubs are provided and linked to the set of Communication Hubs to ease identification of the Devices by the relevant CSP.	Med

Appendix A; Original High Level Business Requirements

The high level business requirements for this Modification were as follows.

Note these requirements have been superseded.

1	The DCC will notify all relevant Users of a Communications Hub firmware update being available
2	The DCC shall trigger the firmware update to a 'pilot group' of Communications Hub prior to mass deployment
3	The Supplier(s) can choose to trigger the firmware update at an earlier time than the DCC's specified deployment date
4	Any solution shall be able to accommodate split Supplier scenarios
5	The DCC will update Suppliers regularly at different stages of firmware processing
6	If issues are identified with deployed firmware, the DCC shall investigate and determine whether to proceed with the roll-out

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
UIT	User Integration Testing

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SECMP0024 'Enduring Approach to Communication Hub Firmware Management'

Business requirements – version 1.0

About this document

This document contains the business requirements and solution design specification for this Modification Proposal. It provides detailed information on the business requirements for the proposed solution agreed by the Proposer with input from the Data Communications Company (DCC), Sub-Committees and the Working Group, and the considerations and assumptions for each business requirement with respect to this Modification Proposal.

1. Business requirements

This section contains the functional business requirements. Based on these requirements a full solution will be developed.

Business Requirements	
Ref.	**Requirement**
1	The DCC will notify all relevant Users of a Communications Hub firmware update being available
2	The DCC shall trigger the firmware update to a 'pilot group' of Communications Hub prior to mass deployment
3	The Supplier(s) can choose to trigger the firmware update at an earlier time than the DCC's specified deployment date
4	Any solution shall be able to accommodate split Supplier scenarios
5	The DCC will update Suppliers regularly at different stages of firmware processing
6	If issues are identified with deployed firmware, the DCC shall investigate and determine whether to proceed with the roll-out

The processes around testing firmware prior to the deployment of Communications Hub firmware updates are out of scope of SECMP0024.

There are two solution variants for this modification, one introducing new Service Request(s) on the DCC User Interface Specification (DUIS) and the other using a DCC operated Web Portal. More information on these solution options can be found in Section 3 of this document.

2. Considerations and assumptions

This section contains the considerations and assumptions for each business requirement.

2.1 General

This mechanism for rolling out Communications Hub firmware updates will be applied to any firmware deployed as part of a SEC Release or a Planned or Unplanned DCC Maintenance Release.

The processes around testing firmware prior to deployment is out of scope of SECMP0024.

A 'pilot group' is defined as a subset of Communications Hubs targeted for firmware deployment, to prove the firmware image is functional and deployable in the production environment before a mass deployment of firmware to devices.

- The maximum size of that subset is to be agreed but assumed for the time being to be 200-300 Communications Hubs.

A 'safe launch group' is defined as the full set of Communications Hub Globally Unique Identifiers (GUIDs) identified to which a firmware image may be applied, less the set of Communications Hub GUIDs associated with the 'pilot group'.

These business requirements give Suppliers the capability to manage Communications Hub firmware updates by selecting deployment dates within a defined period set by the DCC. It is recognised that use of 'date' will become a 'period' used to describe a timespan during which an action will be completed. The precise definition of this term will be determined during design workshops with input from the Proposer, Working Group and the DCC. The reason for this is to allow the DCC to consult with stakeholders on the timeframe of firmware deployment with a view to allowing the DCC the ability to manage workload and demand on the DCC Total System.

Please note that:

- Design of the SLA structure that will govern this process will occur during design process and will be documented in the DCC Impact Assessment.
- Split Supplier scenarios will be fully addressed during the design process and will be documented in the DCC Impact Assessment

2.2 Requirement 1: The DCC will notify all relevant Users of a Communications Hub firmware update being available

The DCC shall notify relevant Service Users and Communications Service Providers (CSPs) of their intention to deploy replacement Manufacturer Images in relation to Communications Hubs.

The notification shall include:

- The Communications Hub Device Model and firmware version in accordance with the Central Product List (CPL) entry;
- A link or reference to the applicable firmware Release Note;
- Severity of the upgrade;
- Priority of the upgrade; and

- The date on which the firmware version will be automatically deployed by the DCC (which will normally be six months from the date of notification of availability).

Where necessary the DCC can set the date on which the firmware version will be automatically deployed earlier or later than the normal date of six months from the point of notification.

The DCC shall create and send a report to all Supplier Users associated with the targeted Communications Hub Device Model and firmware version, to:

- Inform that Supplier User of the Communications Hub GUIDs they are responsible for, that the Communications Hubs are eligible for the firmware update; and
- Advise whether that Supplier User is the Import and/or Gas Supplier.

The DCC have advised that Users will receive information on Communications Hub firmware updates via firmware Release Notes published on the DCC's operational SharePoint.

- In the case of SEC Releases, firmware Release Notes shall be published and updated throughout the testing cycle.
- For Maintenance Releases, firmware Release Notes shall be published at the earliest convenience.

The DCC shall have the capability to revoke notification of a new Communications Hub firmware image if circumstances require.

2.3 Requirement 2: The DCC shall trigger the firmware update to a 'pilot group' of Communications Hubs prior to mass deployment

The Import Supplier and/or the Gas Supplier (as applicable) shall be able to have a view or extract a list of Communications Hub GUIDs published by the DCC to which the new firmware image may be applied. From this list the Supplier shall be able to select which Communications Hub GUIDs should make up a 'pilot group' for this firmware update.

- The solution shall provide the Supplier User with a facility to select a 'pilot group' of Communications Hub GUIDs via configurable business rules.

The Supplier User shall submit the 'pilot group' list of Communications Hub GUIDs.

The DCC shall notify all relevant parties of the start of a 'pilot group' deployment and provide progress updates to all relevant parties during a 'pilot group' deployment. Progress updates should include:

- Success/fail status of deployment at the individual device level
- In the event of a failure, the failure reason and any other commentary should be provided

The DCC shall notify all relevant parties of the end of a 'pilot group' deployment including commentary on the success or failure of the deployment.

2.4 Requirement 3: The Supplier(s) can choose to trigger the firmware update at an earlier date than the DCC's specified deployment date

The Import Supplier and/or the Gas Supplier (as applicable) for a Communications Hub shall be required to instruct the 'pilot group' or 'safe launch' activation of the firmware updates for a time no

later than the time specified by the DCC in Requirement 1: The DCC will notify all relevant Users of a Communications Hub firmware update being available.

Where there is only one Supplier or where the Import Supplier and the Gas Supplier are the same Party, instruction needs only to be given by that Supplier.

Where the Import Supplier and the Gas Supplier are separate Parties, the DCC must receive instruction from both Suppliers before the firmware update is deployed. The DCC shall inform each Supplier that there is a second Supplier (but not who that Supplier is) and whether that Supplier has provided instruction to update the Communications Hub.

For split Supplier scenarios, please see 2.5.

Any instructions must be received by the DCC no later than one month before the DCC's automatic activation time and must specify an earlier time than the DCC automatic activation time.

Upon receipt of the instruction, the DCC shall distribute the Communications Hub firmware update to the specified Communications Hub GUIDs. The firmware activation will take place during the specified date and time.

If no instruction is received, the activation of the firmware update will take place at the time specified by the DCC in Requirement 1: The DCC will notify all relevant Users of a Communications Hub firmware update being available.

The DCC and Suppliers shall be able to instruct the 'safe launch group' of firmware updates to Communications Hub GUIDs in batches, should they choose to do so. See also 2.3 for the 'pilot group'.

The solution shall allow for the management of groups of Communications Hub GUIDs in batches of at least 50,000.

For clarity, a Supplier should be able to select all of the relevant Communications Hubs for which it is responsible, ahead of the DCC mass deployment date for firmware deployment. It may be beneficial for a Supplier to adopt this approach and to deploy a Communications Hub fix as soon as practical to either:

- Deploy a bug fix to solve an issue which is affecting live customers as soon as possible; and
- So that a planned deployment of a sequenced update can be managed by the Supplier.

2.5 Requirement 4: Any solution shall be able to accommodate split Supplier scenarios

In a split Supplier scenario, both the Import and Gas Suppliers need to coordinate Communications Hub firmware deployments. The solution shall provide for functionality that requires both Suppliers to agree in the event that one Supplier wishes to deploy earlier than the DCC's planned deployment date. Please see process shown in Figure 1: Communications Hub upgrade Responsible Suppliers below.

In the event that both Suppliers do not agree to an earlier deployment date, the DCC proposed deployment date shall be the planned deployment date.

In the event that both Suppliers wish to deploy earlier than the DCC proposed deployment date; and both Suppliers have proposed different deployment dates, the later of the two deployment dates shall be the planned deployment date.

2.6 Requirement 5: The DCC will update Suppliers regularly at different stages of firmware processing

Upon the receipt of the instruction to deploy, the DCC shall inform the requesting Supplier User(s).

If any of the Communications Hub GUIDs failed the DCC's message validation checks, the DCC shall inform the requesting Supplier(s), listing all the Communications Hub GUIDs that failed and the reason for the failure in each case.

Supplier Users shall be able to query or extract a report detailing the Communications Hub firmware status for their entire deployed estate.

The solution shall be capable of showing each actor in the process how long they have to complete tasks.

The solution shall be capable of presenting to each actor in the process a dashboard showing:

- Status of each firmware upgrade 'in flight';
- Outstanding actions; and
- Next action date for other actors in the process.

Upon the DCC receiving the confirmation of successful firmware activation in the Communications Hub, the DCC shall update the Smart Metering Inventory (SMI) if the firmware version has changed and notify the current Supplier(s) of that Communications Hub GUID.

2.7 Requirement 6: If issues are identified with deployed firmware, the DCC shall investigate and determine whether to proceed with the roll-out

The instruction mechanisms under Requirement 3: The Supplier(s) can choose to trigger the firmware update at an earlier date than the DCC's specified deployment , shall allow the DCC and Suppliers to roll out firmware updates in batches, should they choose to do so.

Following deployment of firmware updates to Communications Hubs, the Supplier(s) can assess the impact this is having on devices connected to the Home Area Network (HAN). If any issues are identified, the Supplier can raise an incident via the DCC Service Desk. The DCC shall establish a mechanism to identify and mark such incidents as a high priority. The incident raised by a Supplier may, in the case of major impact to live customer operations, request an emergency stop to deployments.

The DCC will carry out a triage of any issues raised by Suppliers[1]. The DCC shall establish a process for reviewing the incidents raised and, based on the type and severity of the issue encountered which will produce one of the following outcomes:

- Proceed with the roll-out as planned;
- Pause the roll-out;
- Delay the end-date of the roll-out; or
- Stop the roll-out completely.

[1] The extent of this capability needs to be defined by the DCC

The confirmation of this decision will rest with the Panel or a nominated Sub-Committee. Where the DCC believes it is critical to halt the roll-out immediately, they may suspend the roll-out pending the outcome of the discussions with the Panel or the nominated Sub-Committee.

The DCC will inform all relevant Suppliers of the decision made as a result of any such review, including what this means for any pending update requests.

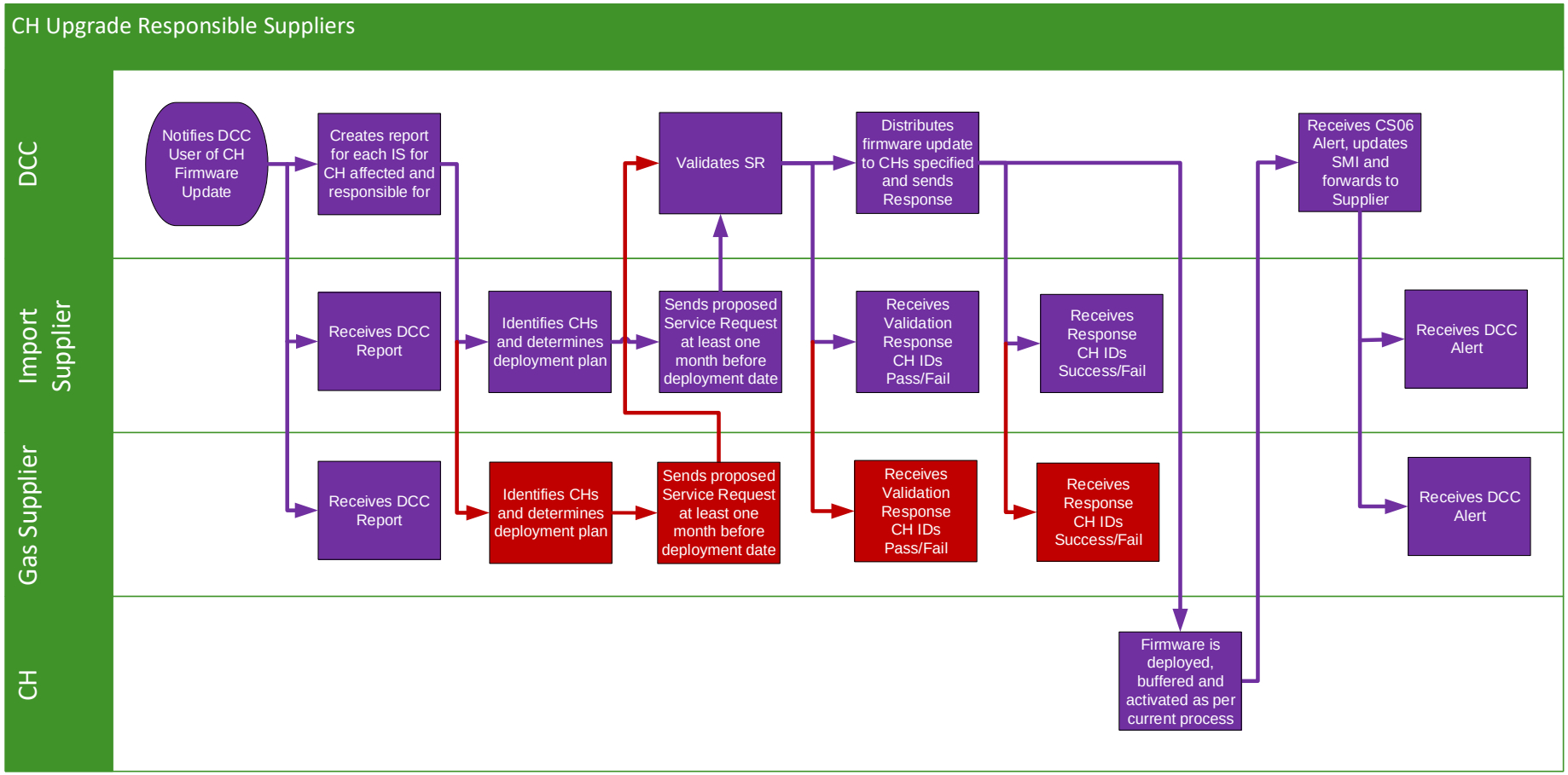

Figure 1: Communications Hub upgrade Responsible Suppliers

3. Solution option overview

This section outlines two approaches to providing a solution against the above business requirements. These have been reviewed by the Proposer with input from the DCC, Sub-Committees and the Working Group.

There are two solution variants for this modification: one introducing new DUIS Service Request(s) on; and the other using a DCC operated Web Portal.

For the avoidance of doubt, both solution options will be assessed against all of the business requirements specified in Business requirements of this document.

3.1 Instructing Firmware updates via Service Request on the DUIS Interface

This solution option will be substantially based on the introduction of a new Service Request (or an enhancement to an existing Service Request) and existing reporting components in the DCC.

3.2 Use of a DCC operated Web Portal

The DCC shall create a web portal where Suppliers can log in to see the list of available updates as notified under Requirement 1: The DCC will notify all relevant Users of a Communications Hub firmware update being available, and confirm which Communications Hubs are to be updated and when these are to take place.

Any web portal must be capable of machine-to-machine interfacing allowing Supplier systems to be connected to the web portal, to allow for real-time updates from the portal to be incorporated into any Customer Relationship Management (CRM) systems.

The requirements for the web portal will be contained in a document that will be referenced within the SEC. Any changes to this document will need to be consulted upon before approval is then given by the Panel or a nominated Sub-Committee.

4. Glossary

This table lists all the acronyms used in this document and the full term they are an abbreviation for.

Glossary	
Acronym	**Full term**
CPL	Central Products List
CRM	Customer Relationship Management
CSP	Communications Service Provider
DCC	Data Communications Company
DUIS	DCC User Interface Specification
GUID	Globally Unique Identifier
HAN	Home Area Network
SMI	Smart Metering Inventory