

SEC Modification Proposal, SECMP0056, DCC CR1093

**IHD / PPMID Zigbee Attributes Available on the
HAN**

Full Impact Assessment



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1 Document History

1.1 Revision History

Revision Date	Revision	Summary of Changes
27/04/2020	0.1	Initial compilation from Service Providers
11/05/2020	0.3	Internal DCC Review
18/05/2020	0.4	Include Critical Software, System Integrator. Update costs and created separate ANNEX document
18/08/2020	0.52	Include updated CSP costs

1.2 Associated Documents

This document is associated with the following documents:

#	Title and Originator's Reference	Source	Issue Date
1	SECMP0056 Solution Design Specification v0.5	SECAS	21/02/2019
2	Preliminary Impact Assessment, SECMP0056 CR1093-PIA-IHD-PPMID Zigbee Attributes v1.0.docx	DCC	26/07/2019
3	BEIS Temporary guidance (TS0893), Historic data on the HAN	BEIS	October 2018

Referenced documents are shown like this in the text: [3].

1.3 Document Information

The original Proposer for this Modification was Emslie Law of SSE Retail.

This DCC Full Impact Assessment was requested of DCC, and the Service Providers instructed to proceed with their submissions in July 2019, including a SECAS request to provide standalone testing costs meant that the document was reissued in August 2019.

Note that the term "Change Request" is used interchangeably with "Modification" throughout this document.

1.4 Document Purpose

This Full Impact Assessment (FIA) is provided further to a DCC Preliminary Impact Assessment (PIA), which was requested by the Working Group with the information requested in accordance with SEC Section D6.9 and D6.10. This document builds on the information previously provided as part of the PIA, clarifying and refining the impact of this SEC Modification on DCC.

2 Solution Requirements and Overview

2.1 Context

This SEC Modification proposal seeks to make Zigbee Attributes available to In-Home Displays (IHDs) and Prepayment Interface Devices (PPMIDs) on the Home Area Network (HAN) to enable them to delete stored consumer consumption data when notified of a Change of Tenancy (CoT).

IHDs, PPMIDs and other Type 2 devices may store historic consumption data, messages addressed to the consumer or Supplier related information which can be considered personal information of the consumer. These devices are currently not notified of a CoT event, potentially allowing a new tenant to access the previous tenant's personal usage data if the devices are used by the new tenant.

With recent changes to data protection rules under the General Data Protection Regulation (GDPR), a mechanism needs to be put in place to ensure compliance.

In October 2018 BEIS set out temporary guidance (TS0893 Historic data on the HAN) and specified the temporary guidance is an interim measure until an enduring solution can be implemented. [3]

2.2 Business Requirements

This section sets out the business requirements for SECMP0056.

2.2.1 Requirement 1 –Delete Consumer Data on IHD/PPMID

The Change of Tenancy event must be made available by the Electricity Smart Meter Equipment (ESME) and the Gas Proxy Function (GPF) to the IHD and PPMID devices on the HAN. The IHD and PPMID must be sent a CoT event setting whenever there is a CoT event and on receipt of this setting, the IHD and PPMID must delete consumer related data stored on the device on a specified date prior to the date indicated in the CoT event.

2.2.2 Requirement 2 –Delete Supplier Messages

Energy suppliers can send messages for display on the user interface of the metering devices, these messages can be also displayed on the IHD/PPMID. Suppliers may choose to customize these messages for individual consumers and this may lead to messages to become personal identifiable information according to the GDPR regulations. The IHD/PPMID should remove supplier messages in case of a CoT event; the ESME and the GPF should clear the active message.

On receipt of a CoT event setting, the IHD or PPMID should delete supplier messages and the ESME and the GPF should delete the active messages related to the supplier.

2.2.3 Out of Scope

Certain parameters can be set by the Suppliers for display on the meter and the IHD; these items may be adjusted for an individual customer. Following on from the discussions in the working group these items are not considered to be subject to protection by GDPR:

- Supplier name and telephone number
- Consumption thresholds

The decision had been made to not clear these items on the IHD or PPMID as part of a CoT event.

2.3 System Requirements

2.3.1 Change of Tenancy– Existing Functionality

Suppliers can send the Service Request (SR) 3.2 “Restrict Access For Change Of Tenancy” via the DCC User Interface Specification (DUIS) interface, which permits to set the time when the CoT event takes place. Note that this time can be in future as well as in the past.

If the SR 3.2 target is the Gas Proxy Function (GPF) this results in Use Case GCS09 being send to GPF. This Use Case contains the elements:

- “Implementation Date/Time” containing the CoT event date and time set by the Supplier
- “Proposed Tenancy Change Control” as fixed value set to 0x00000200, thus indicating with the bit #9 set to 0b1 to “Clear IHD Data – Consumer”

Upon reception of Use Case GCS09 the GPF restricts the forwarding of consumption related data predating the CoT event to the IHD/PPMID.

Note: The current CH implementation for a SRV3.2 targeting the GPF (GCS09) with “Implementation Date/Time” set in the future would restrict the data access as of now for IHDs/PPMIDs. No historic data would be made available until after the date set in “Implementation Date/Time”.

In case the SR 3.2 targets the ESME, this results in the Use Case ECS12 being sent. The Use Case contains the date and time of the CoT event in the OBIS object 0-0:94.44.3.2, this is a UK specific OBIS object.

Upon reception of Use Case ECS12 the ESME restricts the forwarding of consumption related data predating the CoT event to the IHD or PPMID.

The settings of Use Cases GCS09 and ECS12 are currently not accessible for HAN devices like the IHD or PPMID.

2.3.2 Change of Tenancy – New Functionality

The CoT parameters must be made available to HAN devices via the ZigBee Device Management cluster.

Upon reception of Use Case GCS09 the GPF must:

- populate the necessary ZigBee Device Management cluster parameters for the HAN and
- clear the last active supplier message

Note that the supplier message was originally targeted at the GSME and then retrieved by the GPF as the Tapping-Off Mechanism (TOM) command. The message will not be cleared on the GSME and still be visible on the GSME display; should this be an issue the scope of this modification proposal needs extending or a new modification proposal needs raising.

Upon the reception of Use Case ECS12 the ESME must:

- populate the necessary ZigBee Device Management cluster parameters for the HAN and
- clear the last active supplier message

Both the ESME and the GPF must support the Device Management cluster as a server. HAN devices like the IHD or PPMID must support the Device Management Cluster as client.

The IHD/PPMID must send the ZigBee “Get Change of Tenancy” command to ESME and/or the GPF; these must respond with the ZigBee “Publish Change of Tenancy” command.

The ESME and the GPF must also be able to push the “Publish Change of Tenancy” command to the IHD/PPMID.

Upon the receipt of the “Publish Change of Tenancy” command the IHD/PPMID must extract the date and time setting and the flag “Clear IHD Data – Consumer”; (this is bit #9 from ProposedTenancyChangeControl Attribute). The IHD/PPMID then clears:

- Historic consumption data. This includes the following restricted data:
 - Profile Data Log
 - Daily Consumption Log
 - Cumulative and historical value store
 - Debt Repayment Log
- Supplier messages

Note that the “Clear IHD Data – Supplier” (bit# 10) of the ProposedTenancyChangeControl Attribute will not be used to avoid changes to the Great Britain Companion Specification (GBCS) use cases and DUIS.

2.3.3 Change of Tenancy – Modifications to Technical Specifications

Modifications to GBCS Table 7.4 must:

- expand the current mandate for the ESME and the GPF to support the ZigBee Device Management cluster as a server to include the support of the “Publish Change of Tenancy” command
- mandate the IHD/PPMID to support the ZigBee Device Management cluster as a client and mandate the support of the “Get Change of Tenancy” command.

In the Smart Metering Equipment Technical Specification (SMETS), the requirements for the IHD in section 6 and for the PPMID in section 7 must add the functionality to:

- query the ESME and the GPF for CoT events at every power up; once per day in ongoing operation, preferably at midnight; and accept a pushed Publish Change of Tenancy command from the ESME or the GPF
- clear historic data consumption and supplier messages for both fuels upon the reception of any Publish Change of Tenancy command.

SMETS must mandate the ESME to:

- Include the support of the ZigBee Get/Publish Change of Tenancy commands on the HAN interface and the setting of the necessary ZigBee attributes following the reception of the ECS12 command.
- Clear the current active supplier message based on the implementation time contained in the ECS12 command.

CHTS must mandate the GPF to:

- Support the ZigBee Get/Publish Change of Tenancy commands on the HAN interface and the setting of the necessary ZigBee attributes following the reception of a GCS09 command
- Clear the current active supplier message based on the implementation time contained in the GCS09 command

ZSE defines that the implementation time of a CoT must be 24 hours ahead of the command time and/or the local time whereas DUIS allows unrestricted entries for the implementation time. GBCS sections 2.2 and 25 lists examples where ZigBee parameters are set differently from the requirement in ZSE; the CoT implementation datetime falls into the same category.

2.3.4 Change of Tenancy – Overview

Figure 1 below shows the main aspects of the changes required for the support of the CoT event with no changes to existing GBCS Use Cases.

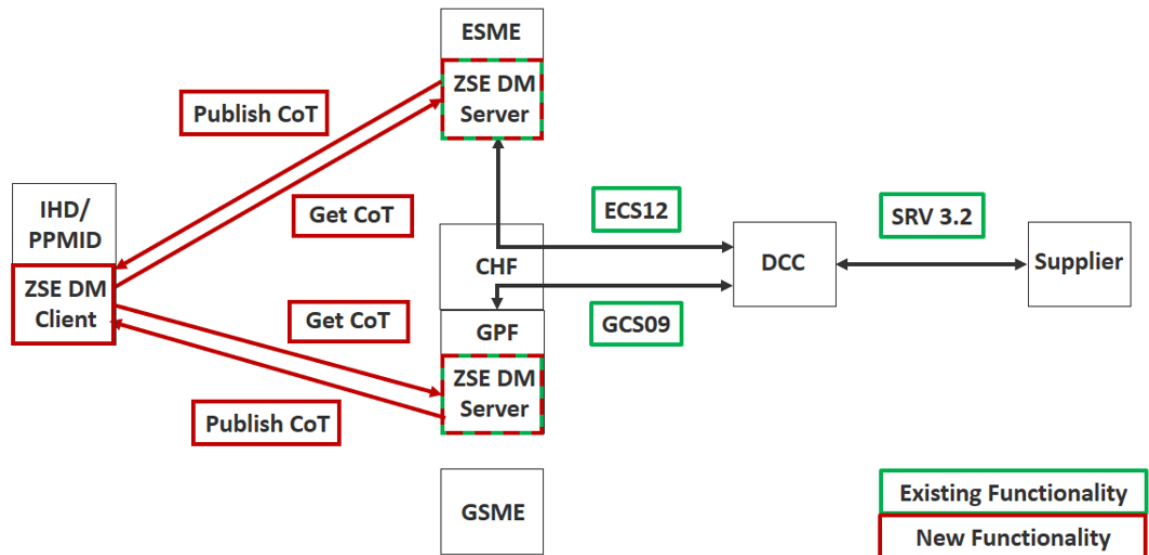


Figure 1: Overview of CoT Functionality

2.3.5 GSME and Comms Hub Exchange

In the case of a Comms Hub exchange, the data held on the GSME will be used to populate the GPF. Since the GCS09 command with the CoT details had been addressed to the previous GPF, all historic and personal data will be shared again with the IHD/PPMID. The supplier should consider repeating the details of the last GCS09 command in a new GCS09 command to prevent the GPF from sharing information which predates the CoT date with the IHD.

2.4 Requirements Summary

Based on the discussions at the Working Group and the Business Requirements as set out in the Solution Design Document, DCC consider the requirements for SECMP0056 to be **STABLE**.

3 Solution Overview

This modification will make it possible for Suppliers to comply with GDPR and provide confidence and assurance to consumers that their data is secure and cannot be seen by others on a device they have no control over.

If the change was not implemented, this could allow a new tenant to access the previous tenant's personal information and place the Supplier in breach of the General Data Protection Regulation (GDPR).

3.1 Overall Solution Impact

The CSPs will be responsible for Comms Hub firmware and other system changes as well as Zigbee and CPA certification.

There are no changes to the existing Technical Specifications.

3.2 Critical Software

To meet the requirements specified in this request, the GBCS Integration Test for Industry (GFI) tools will need to implement full support of the Change of Tenancy (CoT) event, namely the following tasks:

- Provide support for ZigBee Data Management Cluster as a Server
- Restrict access to consumer data predating the CoT
- Support binding for Data Management Cluster
- Support Get CoT ZB command / Response
- Push the Publish CoT upon reception of use case GCS09
- Clear last active message from Supplier on GPF
- Functional testing
- System/regression testing
- Release tasks
- Documentation updates

The Parse & Correlate service will be impacted by this change also.

3.3 CSP Changes and Impact

This Modification requires a Communications Hub Firmware changes.

3.3.1 Communications Hub Changes

Both CSPs will design, build and unit test modifications to the Communications Hub firmware for all currently produced Production, Remote Test Lab and Instrumented Test Lab Comms Hub variants to comply with changes in this Modification.

To deliver this Modification, the CSPs will uplift the Communications Hub software and using the following software modifications of the following components.

Affected System	Description of Change
Communication Hub	For use Case GCS09, update Device Management Server Cluster parameter and modify handling of Supplier message ToM command
	Implement the response mechanism for 'Get CoT COMMAND to GPF'
	Implement the PUSH 'Publish CoT' to IHD/PPMID
	Implement handlers to verify power up CoT behaviour, periodic once per day CoT behaviour.
	Align the two CHTS requirements on GPF
GBCS Message Processing	Overriding of ZSE definitions based on GBCS section 2.2 and 25, for CoT has to be managed.
	Align to GBCS Table 7.4
	Clear the last related active supplier message, update the 'ChangeofTenancyUpdateDate/Time' attribute with the time form the GCS07, and send a 'Publish Change of Tenancy' command

3.3.2 ZigBee Changes

The GPF shall support the 'ZigBee Device Management' cluster as a server on the gas ESI, which has no mandatory attributes or commands

The GPF shall support 'Publish Change of Tenancy' command which is designed as follows in the ZigBee Smart Energy Standard.

D.10.2.4.1 **Publish Change of Tenancy Command**

This command is used to change the tenancy of a meter.

D.10.2.4.1.1 Payload Format

Octets	4	4	1	4	4
Data Type	Unsigned 32 bit Integer	Unsigned 32 bit Integer	8 bit Bitmap	UTC Time	32 bit BitMap
Field Name	Provider ID (M)	Issuer Event ID (M)	Tariff Type (M)	Implementation Date/Time(M)	Proposed Tenancy Change Control (M)

Figure D-158– Publish Change of Tenancy Command Payload

Figure 2: Publish Change of Tenancy Command

For this command, the parameters would be set to:

- Provider ID shall be set to 0xFFFFFFFF
- Issuer Event ID shall be set to 0xFFFFFFFF
- Tariff type shall be set to 0xFF
- UTC time shall be set to the CoT Time from GCS07
- Proposed Tenancy Change Control shall be set to 0x00000000

The GPF shall support 'Get Change of Tenancy' command and the 'ChangeofTenancyUpdateDate/Time' attribute, this shall be set to 0xFFFFFFFF before a Change of Tenancy is set.

3.3.3 **GBCS Message Processing**

The GPF shall change the processing of the GCS09 'Set Change of Tenancy date on GPF' command to add the following once a response has been received from the GSME.

Note: "Proposed Tenancy Change Control" as fixed value set to 0x00000200 in GBCS, thus indicating with the bit #9 set to 0b1 to "Clear IHD Data – Consumer". This is not changed in this CR.

- Clear last active supplier message 'GCS07' on the GPF. This will be published to bound devices.
- Update the 'ChangeofTenancyUpdateDate/Time' attribute with the time form the GCS09

- Send a 'Publish Change of Tenancy' command.

3.3.4 ZigBee and CPA Certification

Due to the changes in the ZigBee cluster support, both full ZigBee and CPA re-certification will be required.

4 Impact on DCC Systems, Processes, and People

This section describes the impact of SECMP0056 on DCC's Services and Systems that impact Users.

There will be impacts on the following components for both of the CSPs:

- Communications Hub
- Platform Test
- Commercial

4.1 Test Support

Where required, the test stub capability and System Test Automation Tools will be updated by both CSPs to automate some of the testing involved for this Modification.

CSP South and Central will update their Access Control Broker (ACB) emulator which is part of the set of test tools used for PIT testing to accommodate the functionality required in this Modification.

4.2 Solution Infrastructure

No additional infrastructure will be required.

4.3 Modification Deliverables

The changed documents are is Communications Hub Detailed Specification (CHDS) CH02. CHDS will be uplifted to include new commands with PIT Test Approach.

5 Testing Considerations

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

Testing costs for SIT and UIT have been built on the following assumptions:

- A standalone SEC Modification release, with an Implementation of Go Live in November 2021 (although this has no bearing on the final costs and durations)
- SIT testing 8 weeks
- UIT testing 4 weeks
- 10 test sets per Comms Hub type. This means 10 for CSP North (5 Single Band CH, 5 Dual Band CH), 20 for CSP South and Central (same split per band, but two meter manufacturers).
- Regression testing

In addition, the cost for all testing and implementation costs will be determined as part of a "Grouping CR" or SEC Release CR, once the full scope of the release that this Modification is allocated to is finalised; that cost will apply to the release and not to an individual SEC Modification.

It should be noted that DCC are attempting to provide real devices to supplement or replace the use of emulators in PIT. This may positively impact test plans, but is not included in this Full Impact Assessment.

Note there is no requirement for supporting application regression testing, as there are no changes in these applications.

Timelines are shown in section 6.1 following although times may well be called out in the following sections.

5.1 Pre-Integration Testing

PIT activities will include the following.

- Uplift of the solution following any accepted CSP defects identified during PIT testing
- Deployment and testing of the changes within this Modification within each CSP's PIT environment
- Maintenance of any existing product certification such that the product certification can be reasonably extended to include the functionality in this Modification
- Key PIT activities including:
 - o Creation of high level test scenarios

- o Walkthroughs of test scenarios with key stakeholders
- o Creation of low level test scenarios and capturing these in the test management system
- o Perform functional testing against requirements and logging any defects
- o Defect management and resolution activities which include triage
- o Perform regression testing to validate that existing functionality is not impacted
- o Evidence walkthrough to DCC-L prior to PIT exit
- o Final PIT execution report provided to DCC-L prior to PIT exit

It should be noted that CSP North expect to carry out two cycles of PIT and SIT testing. Their experience to date has indicated that using emulators in the PIT environment means that some defects only become clear when real devices are used in the SIT environment. In addition CSP North's quoted price includes two quotes, one for pragmatic risk-based regression testing, the other for full regression testing.

5.2 System Integration Testing and User Integration Testing

Both CSPs will provide support and Triage services while testing is carried out for SIT and UIT. The testing will be led by the System Integrator.

Supporting CSP testing, which is to be tested against all three makes of CHF, involves the following:

Test Preparation

1. SMETS 2 devices to be used for testing and the GBCS and SMETS2 versions to be tested against will be defined by the CSPs at the time of execution to support this testing.
2. Ensure there is an active Supplier Message on the ESME and GPF by executing SRV3.1
3. Verify Consumption data is available by executing SRV4.17 (Daily Consumption Log).
4. Create new test scenario and test script to execute SRV3.1, SRV4.17 and SRV 3.2

Test Execution

Execute the new Test Script which will consist of executing the following activities:

1. Execute SRV3.2 (Restrict Access to Data for CoT) Use Cases ECS12 and GCS09 for the ESME and GPF.

2. Verify via the PPMID/IHD User Interface that the Historic Consumption Data and Supplier Messages are not displayed for any time prior to the date set by SRV3.2.
3. Execute SRV8.9 to check the logs of the above activities.

For ESME and GPF this is to be executed against one CHF from CSP North and the two CHFs from CSP South and Central on SBCH.

There is a pre-requisite for the respective CSP to Install and Commission at least three device sets and carry out preparation if required.

5.3 Framework and Testing Tools

This Modification will require the following changes to support CH testing:

- Design, build and unit test modifications to CSP test tooling required to assure the CSP solution within the PIT environment including meter test stubs
- CSP South and Central will update their Access Control Broker (ACB) emulator which is part of the set of test tools used for PIT testing to accommodate the functionality required in this Modification.

6 Implementation Timescales and Releases

This Modification was expected to be included in a SEC release in November 2021. Implementation timescales will be finalised as part of the relevant SEC Release Change Request.

6.1 Change Lead Times and Timelines

From the date of approval (in accordance with Section D9 of the SEC), to implement the changes proposed DCC requires a lead time of **11 months**.

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

Phase	Approx Duration	Start	End
SECAS agreement on scope of release		January 2021	
Design	30 days	January 2021	February 2021
Development and Build	80 days	December 2020	April 2020
PIT Phase	65 days	April 2020	June 2020
SIT Phase	55 days	June 2020	August 2020
UIT Phase	20 days	October 2021	November 2021
Transition to Operations and Go Live	3 days	November 2021	November 2021

Table 1: CSP North November 2021 Release Timescales

Note that the implementation lifecycle is expected to fit into this schedule. In order to achieve this timescale and implement changes alongside other releases such as SMETS1 it may be necessary to align some activities with those programmes of work.

CSP South and Central have provided a slightly different plan.

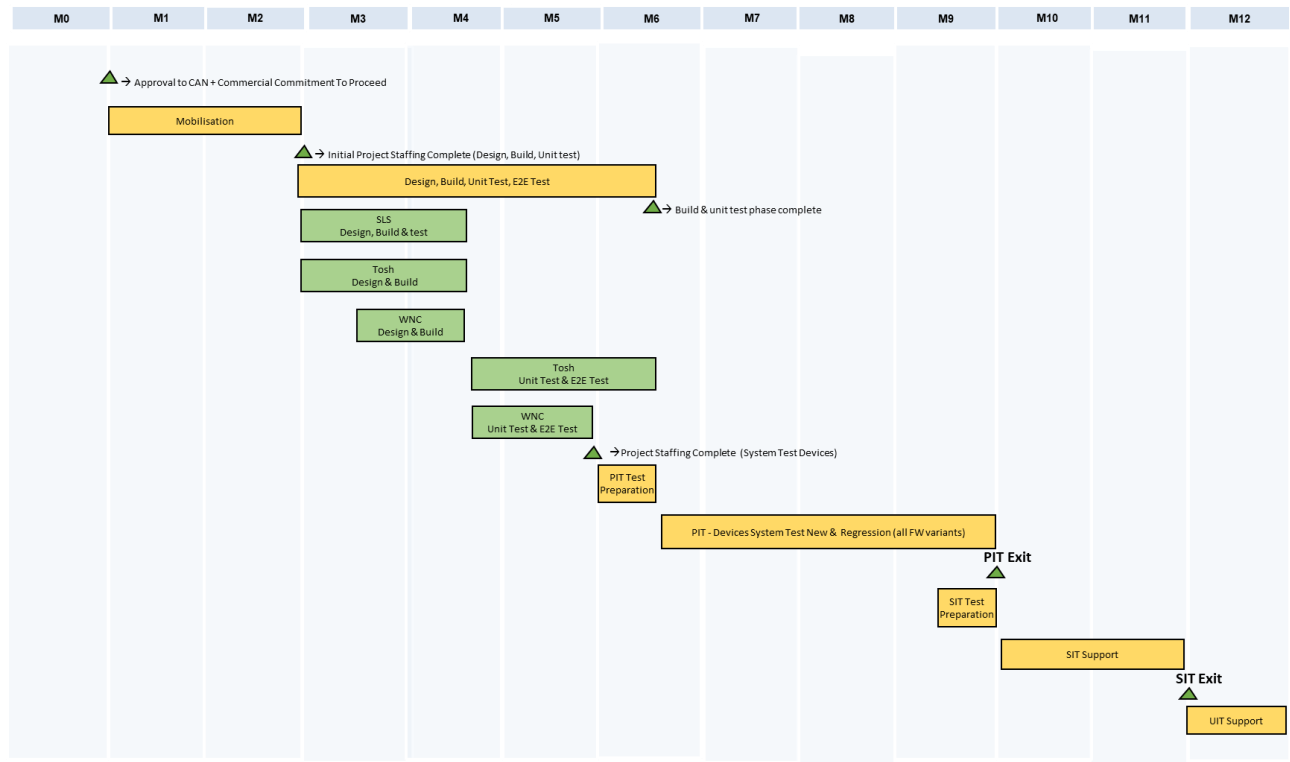


Figure 3: Implementation Plan for CSP South and Central

The expectation that UIT would take four weeks makes the two plans quite similar.

6.2 Release Allocation and Other Modifications

When a decision is made on the potential SEC Release for this Modification, an assessment of any overlaps or duplication of functionality, particularly testing will be made. Allocation to a SEC Release is decided when the Modification is approved. The allocation to any release may be dependent on other Modification timings and the suitability of a release.

At this time, there no functionality overlaps with other Modifications has been identified.

6.3 Costs and Charges

This section indicates the quote per application development stage for this Modification. Note these costs assume a standalone release of just this SEC Modification without any other Modifications or Change Requests in the release, which is not truly reflective of what the test costs or programme duration will look like. A calculation of those costs will be carried out when the contents of the future Release are finalised and the post-PIT costs determined through a "Grouping CR" also referred to as a "Release CR".

£	Design and Build	PIT	SIT	UIT	TTO	SP Total
Phase Total	478,981	1,278,979	993,995	105,160	78,932	2,949,147

Design and Build	The production of detailed System and Service designs to deliver all new requirements. Build includes 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)	Each Service Provider 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 SP 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 made ready for use by Users as part of a live service.
Application Support	Any costs associated with supporting the new functionality. None are anticipated related to this Modification.

6.4 Impact on Contracts and Schedules

It is not expected that there will be material changes to the contract as a result of this change. The actual changes will be assessed as part of the Contract Amendment Note (CAN).

At a minimum, the following schedules will be updated as a result of the changes introduced by this Modification:

- Schedule 6.1 - to reflect delivery milestones
- Schedule 7.1 - to reflect payment milestones under this Modification;
- Schedule 11 - to reflect an uplift to the CH specifications;
- Schedule 12 - to reflect the uplifted technical requirement details, including Communications Hub Detailed Specification (CHDS) and Communications Hub Technical Specification (CHTS)

7 Risks, Assumptions, Issues, and Dependencies

The tables below provides 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.

7.1 Risks

Ref	Description	Status/Mitigation
SIA15-A-R1	Any changes to the scope or interpretation of the items in scope will need to be agreed with the DCC in the first instance and will require reassessment and therefore agreement from the DCC that they accept the impact in terms of cost and time.	Accepted.
SIA15-A-R2	There is a risk that any changes to previous deliveries or overrunning of previous projects will impact the timescales for delivery of the Modification.	Accepted
SIA15-A-R3	The availability of the revised CHTS and GBCS specifications may delay this programme.	Accepted
SIA15-A-R4	If the GSME firmware version which aligns with GBCS functionality within the Modification is not available for SIT testing, new functionality cannot be effectively verified.	Accepted.
SIA15-A-R5	Any requests for additional or extended rounds of testing would impact the overall cost and schedule.	Accepted
SIA15-A-R6	Should test phases be delayed for reasons outside of Service Provider's control, additional charges will apply.	Accepted
SIA15-A-R7	The meter emulators are not representative enough of real meters, meaning defects may be found in SIT testing, which are not found in PIT.	Accepted but meter emulators will be specified and developed for the release.
SIA15-A-R8	The Environment Refresh plan (PIT-B and SIT-B) impacts the Modification timeline when test environments are upgraded. The CSP North PIT-B and UIT-B Test Environments are provided to the end of June 2020. If the timing of implementation of this change means that any testing takes place after the end of June 2020 there will be no B-Stream Test environment and that testing will need to take	Accepted. DCC needs to secure and refresh as appropriate.

	place on the A-Stream Test Environment. This could affect defect fixes and other upgrades which are intended to be tested on the A-Stream Test Environment.	
SIA15-A-R9	The CSPs currently only have the capability to execute two sets of Comms Hub firmware PIT testing in parallel. If other PIT testing activities are already being conducted with higher priority as defined by DCC, this Modification's PIT testing may be delayed.	Accepted. Note this limit will impact any other Comms Hub changes proposed in this timeline.
SIA15-A-R10	The charges set out in this IA are based on CSP North's understanding of the Modification as set out in the IA. If the approved CHDS or CHTS is different, then any programme or cost risk arising from those changes rests with the DCC. CSP North's price includes the cost of providing one draft of these documents. If further drafts are necessary, for any reason other than an oversight by CSP North of changes known to CSP North at time of CAN, the cost of these further changes will be paid by the DCC on a time and materials basis. The DCC are responsible for, and will run, the consultation in regard to these changes. The risk of these changes leading to programme delay or additional work to change the implementation will rest with the DCC.	Accepted
SIA15-A-R11	The Comms Hub firmware does not meet the defect mask after two cycles of PIT testing, requiring further development and testing.	Accepted
SIA15-A-R12	If the System Integrator cannot execute the SIT Test Phase per test cycle in the assumed periods, the baseline schedule may be impacted.	Accepted
SIA15-A-R13	Further defects may be found in UIT Enduring Testing, after the UIT project testing has completed, blocking the OA process.	Open
SIA15-A-R14	Should the DCC want to introduce real meters and devices into CR1197 PIT testing, the baseline delivery scheduled for CR1197 may be impacted.	Accepted
SIA15-E-R1	Firmware delivered late and delays PIT/Delivery	Reduce. Frequent reviews with firmware suppliers, Critical Software audit implementation, EDM I contracted on a fixed price basis
SIA15-E-R2	Additional Assurance Maintenance Plan (AMP) cycle(s) of Commercial Product Assurance (CPA) required due to defects	Reduce. CSPs and firmware suppliers to be involved in testing approach. EDM I contracted on a fixed price basis for resolution of defects within their software."

SIA15-E-R3	PIT completion is delayed by issues with (EDMI) firmware	Reduce. 2 cycles of PIT testing included in project plan
SIA15-E-R4	SIT testing is extended due to Severity 2 issues identified during SIT	Reduce. 2 cycles of SIT testing have been included in the project plan
SIA15-E-R5	UIT testing is extended due to Severity 2 issues identified during UIT	Reduce. 2 cycles of PIT and SIT have been included in the project plan
SIA15-E-R6	Following completion of UIT project testing, defects are found in Enduring UIT which block OA	Accepted. DCC to accept that these defects are managed differently so that the impact is mitigated
SIA15-E-R7	The firmware supplier (EDMI) fix duration is greater than the 4 weeks currently assumed in the plan	Reduce. Regular defect triage and reviews to track progress and minimisation of schedule impact by testing in parallel with supplier testing
SIA15-E-R8	Planned resources are unavailable	Reduce. Ensure that a robust project plan (with appropriate durations) is in place prior to the commencement of the Modification which factors in commitments on other CRs
SIA15-E-R9	Existing programmes delay delivery of this Modification.	As above. Mitigation carried out under the existing programmes"
SIA15-E-R10	SLS emulator firmware for the relevant version of GBCS required for Modification is not available for PIT or SIT testing	Accepted
SIA15-E-R11	Current programme work-off and/or prod fixes are added to scope, increasing development & test timescales	Accepted, scope will be finalised before work starts
SIA15-E-R12	DCC does not finalise scope before instruction to proceed	Accepted
SIA15-T-R1	There is a risk that incorporating new functionality, such as this Modification, as part of a firmware maintenance release will, should defects be identified related to this Modification, block the progression of maintenance fixes.	Open

	<p>Should this scenario occur and there are no Severity 1 or 2 defects related to the scope of this Modification, CSP South and Central expect DCC-L to:</p> <ul style="list-style-type: none"> Continue to support the progression of the maintenance release through the test cycle and through OAB. As the changes do not relate to any BAU SU used functionality this is a reasonable approach Support the introduction of defect fixes as part of a further maintenance release 	
SIA15-T-R2	<p>There is a risk that any specification misinterpretation that is identified during testing the firmware releases associated with this Modification result in the need to iterate the Comms Hub firmware, delaying the availability of compliant firmware in Production and resulting in additional effort to test additional firmware releases and manage the progression of that firmware.</p>	<p>Accepted. Design reviews and workshops will cover in detail each aspect of the change.</p>

7.2 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
SIA15-A-A2	It is assumed that no additional test devices will be required for this Modification.	Accepted
SIA15-A-A3	PIT System testing will be performed against emulators or stubbed ESME and GSME devices and the scope of PIT testing will be similar to earlier Releases.	Accepted.
SIA15-A-A4	All test activities are planned in sequence.	Accepted
SIA15-A-A5	CPA will be obtained through AMP.	Accepted
SIA15-A-A6	ZigBee full recertification will be required.	Accepted
SIA15-A-A7	This CR (CR1197), the Modification, will be the 'change' scope for this release.	Rejected (Ignore). A separate CR will be raised for Post-PIT Testing of all changes in a future release.
SIA15-A-A8	No formal OCT and DIT Test Phases are planned for this release.	Accepted
SIA15-A-A9	No weekend work is planned. If needed, prior notice will be required and additional costs may be applicable.	Accepted

SIA15-A-A10	Should test phases be delayed for reasons outside of CSP North's control, additional charges will apply.	Accepted
SIA15-A-A11	SBCH testing is of a higher priority than DBCH testing.	Accepted
SIA15-A-A12	A full cycle of testing will be carried out in SBCH and DBCH variants and a subset will be verified in DBCH-F, SBCH-ITCH, DBCH-ITCH variants.	Accepted
SIA15-A-A13	PIT testing is executed with emulators only.	Accepted
SIA15-A-A14	Any changes to schedule and/or cost to the PIT testing approach to include testing with real meters will be covered under a separate DCC Modification.	Accepted
SIA15-A-A15	The DCC will provide a separate CR to formally recognise the DCC Operational Acceptance process (OA).	Accepted
SIA15-A-A16	It is assumed that resource will be available to implement this Change and that no mobilisation is necessary. If this is not the case, then timescales are subject to change and will be confirmed at CAN.	Accepted
SIA15-A-A17	This IA assumes that the B-Stream Test Environments (PIT and UIT) are closed down at the end of June 2020 in line with the current Agreement. This IA does not include any costs for the replacement of, or the extension of the availability of, the B-Stream Test Environments. Ref SIA15-A-R8.	Ignore. DCC intends to extend the availability of the B-stream environments.
SIA15-A-A18	This IA has been based on completion of CR1047 (GBCS v3.2) prior to commencement of those Modification. If this is not correct, then the pricing and timescales are subject to change.	Accepted
SIA15-T-A1	During PIT the following devices combinations will be tested: <ul style="list-style-type: none"> CR1197 (Modification) compliant test stub and CR1197compliant CH Non- CR1197 compliant test stub + CR1197 compliant CH. 	Accepted
SIA15-T-A2	Assume GPF implementation will be backward compatible with non-compliant GSME by filling up missing time-stamp attributes with Communications Hub's own time-stamp.	Accepted
SIA15-T-A4	Assume the scope of the PIT Approach uplift required to support this Modification in regard to CH firmware change is limited to: <ul style="list-style-type: none"> Proving via PIT testing that the GPF is able to record a value of the ReadingSnapshotTime attribute provided by a GSME; 	Accepted

	<ul style="list-style-type: none"> Proving the GPF can populate the date-time field in the responses for the GBCS use cases listed 	
SIA15-T-A5	Assume there is sufficient capacity within the SIT plan to test any planned Communication Hub related releases defined within this Modification across both SBCH and DBCH.	Accepted
SIA15-T-A6	Assume there will be a single iteration of software required for this Modification from the Communication Hub vendors. The delivery plan for this release has a single iteration.	Accepted
SIA15-T-A7	Assume there is a change in the DUIS schema version used for the CSP management interface and there is additional effort to load the updated DUIS schema and to regression test this functionality in PIT.	Accepted
SIA15-T-A8	<p>Assume that the firmware changes to support the delivery of this Modification will be managed via the incorporation of the change within a firmware maintenance release and not as part of a DCC release operating in parallel with the maintenance release process.</p> <p>Whilst CSP South and Central understand that the incorporation of changes and fixes within maintenance releases is something that will be discussed with DCC-L as part of release planning, it has been necessary to make this assumption from a commercial planning perspective.</p>	Open
SIA15-T-A9	Creation of a version of the appropriate SEC technical specifications (including any of GBCS and CHTS) to support this Modification such that it can be deployed into Production	Accepted

7.3 Issues

None at this time.

7.4 Dependencies

Reference	Dependency	Implication if dependency not met	Status
SIA15-T-D1	There is a dependency on the Technical Specifications to include the changes in this Modification	If the specifications are not updated, then this Modification cannot be promoted into Production and DCC shall be liable for any wasted costs	Open

SIA15-T-D2	There is a dependency on CPA security characteristics to be updated to align with the Technical Specifications mentioned in SIA15-T-D1	If CPA is not updated to align with the new Technical Specifications, then the change can't be delivered	Open
SIA15-T-D4	Any defect fixes that may prevent OAB for the Comms Hub firmware releases delivered under this Modification should be included in the firmware scope at least twenty (20) days prior to the release of that firmware into PIT. Defects must have been confirmed and triaged by the respective CSP and associated Communication Hub manufacturer.	CSP South and Central will be unable to incorporate the defect fixes into the specified release	Accepted

Appendix A: Glossary

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

Acronym	Definition	Acronym	Definition
ACB	Access Control Broker	GDPR	General Data Protection Regulation
BEIS	Department for Business, Energy & Industrial Strategy	GFI	GBCS Integration Test for Industry
CAN	Contract Amendment Note	GPF	Gas Proxy Function
CH, Comms Hub	Communications Hub	GS	Gas Supplier
CHTS	Communication Hubs Technical Specification	HAN	Home Area Network
CoT	Change of Tenancy	HCALCS	HAN Connected Auxiliary Load Control Switch
CPA	Commercial Product Assurance	IHD	In Home Display
CPL	Central (formerly Certified) Products List	OTA	Over The Air
CR	Change Request	PIA	Preliminary Impact Assessment
CSP	Communication Service Provider	PIT	Pre-Integration Testing
DBCH	Dual Band Comms Hub	PPMID	PrePayment Meter user Interface Device
DCC	Data Communications Company	ROM	Rough Order of Magnitude (cost)
DSP	Data Service Provider	SBCH	Single Band Comms Hub
DUIS	DCC User Interface Specification	SEC	Smart Energy Code
ES	Electricity Supplier	SIT	Systems Integration Testing
ESI	Energy Service Interface	SMETS	Smart Metering Equipment Technical Specification
ESME	Electricity Smart Meter Equipment	SMI	Smart Metering Inventory
FIA	Full Impact Assessment	SP	Service Provider
FMP	Firmware Management Process	SR	Service Request
GBCS	Great Britain Companion Specification	TOM	Tapping-Off Mechanism
		UIT	User Integration Testing