SEC Modification Proposal, SECMP0078, DCC CR1233, CR1342

Incorporation of Multiple Issue Resolution Proposals into the SEC - Part 2

Preliminary Impact Assessment (PIA)

|  |  |
| --- | --- |
| Version: | 0.85 |
| Date: | 18th November, 2020 |
| Author: | DCC |
| Classification: | DCC PUBLIC |

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# Executive Summary

The Change Board are asked to approve the following:

* Total cost to complete the Full Impact Assessment of £94,430
* The timescales to complete the Full Impact Assessment of 50 days
* ROM costs for SECMP0078, up to the end of Pre-Integration Testing (PIT), of £465,680 – subject to the implementation of SECMP0078 alongside SECMP0015 and SECMP0056 in the June 2022 SEC System Release

SECMP0078 includes three Issue Resolution Proposals, IRP550, IRP603, and IRP604, as follows:

* IRP550 addresses cases a failure occurs while a Device executes GCS20r and errors occur in Device processing
* IRP603 would ensure security logs are not available to PPMID, IHD, or CAD devices or readable through non-secured access which might otherwise compromise the security of the Smart Metering System
* IRP604 is a GBCS text only change based on IRP550

The total ROM costs to deliver SECMP0078 are £705,680, which includes Design, Build and PIT, and a tolerance of ±20%.

It is estimated that the cost to deliver SECMP0078 would reduce by £240,000 should the Modification be released alongside SECMP0015 and SECMP0056 as a result of synergies across the testing phase. Currently SECMP0015 and SECMP0056 are targeted for the June 2022 SEC System Release. It is proposed that SECMP0078 is released in June 2022 to take advantage of the projected cost savings. This would give a cost of £465,680.

The cost to prepare a Full Impact Assessment are quoted at £94,430. This represents approximately 6% of the total SEC Release cost (including estimated post-PIT costs) to deliver the Modification which is the usual ratio of assessment costs to delivery cost.

The Change Board are asked to also approve that the FIA will take 50 days to complete which is 10 days more that the current Service Level Agreement (SLA) of 40 days.

The first PIA was requested of DCC on 30th September 2019. DCC submitted an initial PIA on 31st December, 2019, and the total ROM was £1.9million. the scope of the Modification was changed, and a further request for a PIA was received on 17th April, 2020. Service Providers submitted a response to DCC with the total costs of the PIA was a ROM of £1.2million. Upon discussions with SECAS, DCC rejected the ROM, requesting that SPs revise their submission. There have been two further iterations and the final ROM is presented within this PIA.

# Document History

## Revision History

| Revision Date | Revision | Summary of Changes |
| --- | --- | --- |
| 27/12/2019 | 0.25 | Initial version |
| 02/01/2019 | 0.27 | Updated Table 1 with CSP impacts |
| 01/09/2020 | 0.5 | Changed requirements, new PIA document |
| 13/11/2020 | 0.8 | Revised with new ROM from CSP North |
| 18/11/2020 | 0.85 | Added Executive Summary. Created separate Code Red Annex. |

## Associated Documents

This document is associated with the following documents:

| Ref | Title and Originator’s Reference | Source | Issue Date |
| --- | --- | --- | --- |
| 1 | MP078-Business-Requirements-v0.4-Updated-2IRPs | SECAS | 17/04/2020 |

References are shown in this format, [1].

## Document Information

The Proposer for this Modification is Simon Trivella of British Gas. The original proposal was submitted in July 2019.

The Preliminary Impact Assessment was requested of DCC on 30th September 2019. DCC submitted an initial PIA on 31st December, 2019. However the scope of the Modification was changed, and a further request for a PIA was received on 17th April, 2020.

1. **Context and Requirements**

In this section, the context of the Modification, assumptions, and the requirements are stated.

The requirements have been provided by SECAS, the Proposer, and the Working Group.

* 1. **Problem Statement**

This SEC Modification handles incorporation of a set of IRPs into the SEC.

## Business Requirements

This section contains the considerations and assumptions for each business requirement. These are excerpts from each of the IRPs and it is expected that the DCC will develop solution(s) to the consequential changes these IRPs will have on the DCC Systems. The document text changes are contained within each of the IRPs.

|  |  |
| --- | --- |
| **Req.** | **Requirement** |
| 1 | IRP550, ‘GCS20r - Response when an error occurs’ |
| 2 | IRP603, ‘Security Log display over HAN’ |
| 3 | IRP604, 'Query on IRP550 - Frame Control' |

Table 1: Business Requirements for SECMP0078, CR1342

### Requirement 1, IRP550 ‘GCS20r - Response when an error occurs’

Errors cannot be signalled via the Zigbee Smart Energy (ZSE) Report Event Configuration command which is currently required as the only option in the GCS20r Response. However, errors could occur in Device processing and so the GCS20r Response needs to allow for such situations.

In common with other Use Cases where this situation applies, the proposed change is to allow the GCS20r Response to contain a ZigBee Default Response (as an Alternate Response) to signal any failures.

These points are fully explained in the attached document from TSIRS.

### Requirement 2, IRP603 ‘Security Log display over HAN’

The Smart Metering Equipment Technical Specification (SMETS) and Great Britain Companion Specification (GBCS) require that:

* the Gas Proxy Function (GPF), Communications Hub Function (CHF), Gas Smart Metering Equipment (GSME) and Electricity Smart Metering Equipment (ESME) Security Logs can be read by remote parties (with access controlled by the DCC).
* the GSME provides changes to its Security Log to the GPF, so that the GPF can maintain a copy of the GSME’s Security Log. This copy can be read by remote parties.
* both the GSME and ESME make their Security Logs available on the user interface (e.g. the meter display) ‘following physical access through the Secure Perimeter’.

The design intention was that these would be the only ways to access Security Logs, so the Logs should not be made available to Home Area Network (HAN) devices (e.g. PPMIDs, IHDs or CADs), by either the Communications Hub or the ESME. Note GSMEs do not communicate with HAN Devices, except for the Comms Hub.

Further, GSME and ESME should not make Security Logs available on the User Interface, unless there has been ‘physical access through the Secure Perimeter’.

However, there are no explicit prohibitions currently for:

* sharing Security Logs with HAN devices
* only displaying security logs without access through the Secure Perimeter

The proposed solution is to amend SMETS (for ESME and GSME) and CHTS (for Comms Hubs) to add explicit prohibitions.

Further information is included in the attached document.

### Requirement 3, IRP604 Query on IRP550 - Frame Control

IRP604 has been identified as a GBCS text only change and will be implemented in SECMP0078, applying text changes on top of those implemented by IRP550. IRP604 can only be implemented at the same time as, or following, the implementation of IRP550.

1. **Description of Solution**

Elements of changes to the solution are identified in the following sections. The following table identifies impacts to each Service Provider.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ref.** | **Requirement** | **DSP** | **Critical** | **CSP North** | **CSP South and Central** |
| 1 | IRP550, ‘GCS20r - Response when an error occurs’ | ✓ | 🗶 | ✓ | ✓ |
| 2 | IRP603, ‘Security Log display over HAN’ | 🗶 | ✓ | ✓ | ✓ |
| 3 | IRP604, Query on IRP550 - Frame Control | 🗶 | 🗶 | ✓ | ✓ |

Table 2: IRP Impacts for Each Service Provider

It should be noted that this solution is only applicable to SMETS2 devices.

## DSP Solution

### IRP550

Currently, there is no way of signalling an error if a failure occurs while a Device executes GCS20r (Read non-critical event and alert behaviours - GSME-Supplier).

However, errors could occur in Device processing and so the GCS20r Response needs to allow for such situations. In common with other Use Cases where this situation applies, the GCS20r Response will be allowed to contain a ZigBee Default Response (as an Alternate Response) to signal any failures. This will be an additional element in the Response.

The Zigbee Cluster Library (ZCL) payload of the Default Response will contain 0x05 as the value of the Command identifier if the GCS20r command does not succeed. DCC Data Systems will need to amend the corresponding Transform Library to support the new element in the GCS20r Response. In the absence of the Default Response, the processing shall be carried out as it is today.

Although a Default Response has been added to GCS20r, this does not change the existing functional behaviour of the Service Request Variant 6.2.10 (Read Device Configuration (Event And Alert Behaviours)) and as such, no changes are expected to DUIS.

### IRP604

IRP604 is a correction to a sub-field that indicates the direction of message (client-server) of the Frame Control field within the new Default Response added to GCS20r. This has no impact on the DSP, as the correction will be done alongside IRP550.

## Critical Software Solution

Changes to Critical Software applications will be required to implement this Modification.

### GFI Core

To meet the requirements specified in **IRP550**, the GBCS Integration Testing For Industry (GFI) tool will need to implement full support of GCS20r as follows:

* + Enhance the GFI Testing Tool to support GCS20r on GFI Testing Tool
  + Implement support for GCS20r on the Reference Test Data Set (RTDS)
  + Update GMST with GCS20r
  + Enhance the Triage Tool to support GCS20r

To meet the requirements specified in **IRP603**, GFI will need to update the Comms Hub to restrict the access of Security Logs to HAN devices.

* + Restrict access to CHF Security Log to Type1 and Type2 devices
  + Restrict access to GPF Security Log to Type1 and Type2 devices

### SMITEn Lite

The changes required to implement this Modification will affect the SMITEn parse service requiring an upgrade to a new version of the Parse and Correlate application.

For the IRPs, SMITEn Lite changes are:

|  |  |
| --- | --- |
| IRP550 | Add integration/system tests for use case GCS20r and review tests. |
| IRP603 | No effort required – this only affects the availability of the Security Logs for HAN devices. |

As a whole, these changes will require the release of a new version of SMITEn Lite.

## Communication Service Provider Changes

Design and build activities to support the following will be required for both Communication Service Providers (CSP):

* Comms Hub; Assessing the impact to the Communication Hub, update and up-issue any new versions of Technical Specifications including CHTS and CHDS
* Comms Hub Manager (CHM); Assessing the impact of changes to CHF Security Log

There will be a requirement for further Zigbee certifications and CPA Certification which is not included in the PIA estimates.

CSP South and Central anticipate that their solution would be delivered as part of the Firmware Management Policy release.

# Impact on DCC Systems, Processes and People

This section describes the impact of SECMP0078 on DCC Services and Interfaces that impact Users and/or Parties.

## 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.

There are no material changes to interfaces or the security solution as part of this Modification and therefore a penetration test is not required. There will not be any changes to the DSP protective monitoring solution as result of this Modification.

CSP Security impacts will require assessing the impact to the network and security vulnerabilities.

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

## Request Management

Request Management will need to add support for the revised Device Future Dated Command processing.

## Data Management

Data Management will require updates to support the revised Device Future Dated Command processing.

## Transform

Transform will be updated to parse the Default Response for the GBCS Use Case GCS20r.

## Self Service Interface (SSI)

SSI will need to be updated such that it ignores the SAT Log entries related to the Response received after the final Execution Alert when determining the final status.

## Integration Impact

The functionality will need to be validated in both the Systems Integration Testing (SIT) and User Integration Testing (UIT) environments and will require integration tests that involve both DSP and the CSPs as a minimum. It is assumed that it will be integrated as part of the November 2021 release. An initial estimate of the costs for Pre-Integration Testing (PIT) of the Modification are included in this PIA. The costs do not include testing in SIT and UIT.

## Infrastructure Impact

There will be no change to the infrastructure design as a result of this change. Additional processing and storage will be required; however, they are not sufficiently large to warrant the procurement of additional compute power or storage as part of this Modification. Note that the aggregated impact of many such changes to the DSP solution will ultimately result in a reduction of the available processing headroom assumed as part of the original DSP agreement. As such, DSP may need to raise a Change Request (CR) for the provision of additional infrastructure should the DCC Data System experience performance problems that are the direct result of such changes.

The change does not impact the DSP resilience or Disaster Recovery implementation.

## Application Support

No changes to Application Support are expected.

## Service Impact

This change updates behaviour of existing functionality. It is not expected that this will have a material impact on service desk activity, however, the change in behaviour will require updated service desk procedures to document expected new processing patterns. The change will also require knowledge transfer from the implementation team to the service desk team ahead of its release to supported environments. A more thorough assessment of the service impact will be carried out as part of the Full Impact Assessment.

## Safety Impact

No impact is expected, but a full Safety Impact Assessment will be carried out as part of the production of the Full Impact Assessment (FIA).

## Contract Schedules

Schedules will require modification to reflect the changes necessitated under this Modification. Contract schedules will be updated as part of a Contract Amendment Note (CAN) which combines schedule updates from other relevant Modifications.

No impact to any DSP contracts are expected.

The following contract Schedules may require amendment in terms of CSP-driven changes:

* Schedule 1 - Definitions
* Schedule 2.1 – DCC Requirements
* Schedule 4.1 - Contractor Solution
* Schedule 6.1 – Implementation Planning (to reflect any delivery milestones)
* Schedule 7.1 – Charges and Payment
* Schedule 11 – Communication Hub (to reflect an uplift to the CH specifications)

# Implementation Timescales and Approach

Notwithstanding in which release this change is implemented, based on the currently stated requirements, the elapsed time for DSP implementation will be approximately 3 months following the provision of full commercial cover. Communication Service Provider (CSP) implementation will be between 6 and 8 months following the provision of full commercial cover.

The release lifecycle duration will be confirmed as part of the FIA. As currently planned, the standard ongoing major release model will provide drops to the production environment in June 2022.

## Implementation Approach

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

## Testing and Acceptance

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.

CSP North platform test and build changes will be as follows:

* Platform Test; Assessing the testing of CH for the implementation of IRPs
* Platform Build; Assessing impact on Platform Build requirements
* Retest against IRP550

CSP South and Central have identified the following testing tasks:

* Creation of additional PIT test scenarios to cover IRP550 and IRP603
* Regression testing on firmware for all 16 Communication Hub (CH) variants. DCC recommends a review on the number of test variants required for the FIA.
* Deployment and testing of the Modification changes within the CSP South and Central PIT environment in accordance with the existing PIT Approach document.
* Deployment of this firmware to the PIT environment.

# Costs and Charges

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

The Rough Order of Magnitude cost (ROM) shown below describes indicative costs to implement the functional requirements. 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.

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 |
| ROM | Up to £705,680 |

It is estimated that the cost to deliver SECMP0078 would reduce by £240,000 should the Modification be released alongside SECMP0015 and SECMP0056 as a result of synergies across the testing phase. Currently SECMP0015 and SECMP0056 are targeted for the June 2022 SEC System Release. It is proposed that SECMP0078 is released in June 2022 to take advantage of the projected cost savings.

|  |  |
| --- | --- |
| £ | Design, Build and PIT |
| Phase ROM | Up to 465,680 |

The phases included are as follows.

|  |  |
| --- | --- |
| 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 |

Based on the existing requirements, the fixed price cost for a Full Impact Assessment is **£94,430** and would be expected to be completed by most of the Service Providers in 30 days. CSP North have requested a period of 50 days.

**Appendix A: Glossary**

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

|  |  |
| --- | --- |
| .**Acronym** | **Definition** |
| CAD | Consumer Access Device |
| CAN | Contract Amendment Note |
| CHF | Communications Hub Function |
| CHM | Communications Hub Management |
| CHTS | Communications Hub Technical Specification |
| CPA | Commercial Product Assurance |
| CR | DCC Change Request |
| CSP | Communication Service Provider |
| DCC | Data Communications Company |
| DSP | Data Service Provider |
| DUIS | DCC User Interface Specification |
| ESME | Electricity Smart Metering Equipment |
| FIA | Full Impact Assessment |
| GBCS | Great Britain Companion Specification |
| GFI | GBCS Integration Testing For Industry |
| GSME | Gas Smart Metering Equipment |
| HAN | Home Area Network |
| IRP | Issue Resolution Proposal |
| PIA | Preliminary Impact Assessment |
| PIT | Pre-Integration Testing |
| ROM | Rough Order of Magnitude (cost) |
| RTDS | Reference Test Data Set |
| SEC | Smart Energy Code |
| SECAS | Smart Energy Code Administrator and Secretariat |
| SIT | Systems Integration Testing |
| SMETS | Smart Metering Equipment Technical Specification |
| SMITEn Lite | Smart Metering Integrated Test Environment Lite |
| SP | Service Provider |
| SSI | Self Service Interface |
| TSIRS | Technical Specification Issue Resolution Sub-group |
| TTO | Transition to Operations |
| UIT | User Integration Testing |
| ZCL | Zigbee Cluster Library |
| ZSE | Zigbee Smart Energy |