Data Communications Company

SEC Modification Proposal, SECMP0078, DCC CR1233

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

Preliminary Impact Assessment (PIA)

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1 Document History

1.1 Revision History

Revision Date	Revision	Summary of Changes
27/12/2019	0.25	Initial version

1.2 Associated Documents

This document is associated with the following documents:

Ref	Title and Originator's Reference	Source	Issue Date
1	MP078-Business-Requirements-v0.2	SECAS	05/11/2019

References are shown in this format, [1].

1.3 Document Information

The Proposer for this Modification is Richard Hartshorn of SSE Networks. The original proposal was submitted in February 2018.

The Preliminary Impact Assessment was requested of DCC on 27 September 2019.

2 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.

2.1 Problem Statement

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

2.2 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	DCC System changes for IRP550 'GCS20r - Response when an error occurs'
2	DCC System changes for IRP554 'Future Dated command handling if activation in the Past'
3	DCC System changes for IRP582 'Read ALCS Event Log values'
4	DCC System changes for IRP603 'Security Log display over HAN'

Table 1: Business Requirements for SECMP0078, CR1233

2.2.1 Requirement 1: IRP550 'GCS20r - Response when an error occurs'

Errors cannot be signalled via the 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.

2.2.2 Req. 2: IRP554 'Future Dated command handling if activation in the Past'

To align with the DCC guidance and to resolve the specification inconsistency, the proposed position is to clarify GBCS section 9.2.2.6 in order to require the CS02b and CS06 specific behaviour required by GBCS sections 11.5.2.2 and 13.3.4.3. These CS02b and CS06 specific requirements mean that the Device generates both a CS02b / CS06 Response and a CS02b / CS06 Alert if executing the CS02b / CS06 Command immediately.

In addition, it is proposed to clarify the wording in GBCS 11.5.2.2 and 13.3.4.3 to make it explicit that, if the executionDateTime is in the past the Command is to be executed immediately and so both the Response and the Alert are to be generated immediately.

2.2.3 Req. 3: DCC System changes for IRP582 'Read ALCS Event Log values'

There are 30 possible values of switchNumber And Action in the ALCS Event Log required to meet the Smart Metering Equipment Technical Specification (SMETS) requirements. However, ECS35f currently suggest there are only 20 (the ten related to ALCS Calendar are not listed in the description of the field). To allow these values to align to other parts of GBCS and so align to values used by ESME, the proposed resolution is to revise the ECS35f text to read:

The first integer shall be the number of the ALCS / HCALCS (so '[n]' in SMETS terms). The second integer shall be (0x11) On, (0x12) Off (0x01) On from the ALCS Calendar, (0x02) Off from the ALCS Calendar, (0x11) On in a Command to the ESME, (0x12) Off in a Command to the ESME, (0x20) Revert to calendar control or (0x00) Entry relates to a Message from an HC ALCS.

Additionally, three related corrections are also proposed, so as to align to DCC systems and ESMEs in operation today.

These points are fully explained in Annex A of IRP582.

2.2.4 Req. 4: DCC System changes for IRP603 'Security Log display over HAN'

SMETS and GBCS require that:

- the GPF, CHF, GSME and 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 CH or the ESME (GSMEs do not communicate with HAN Devices, except for the CH).

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 position is to amend SMETS (for ESME and GSME) and CHTS (for Comms Hub) to add explicit prohibitions.

3 Description of Solution

Based on the discussions at the Working Group and the Business Requirements as provided, DCC consider the requirements for SECMP0078 to be **STABLE**.

3.1 High Level 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	IRP554, 'Future Dated command handling if activation in the Past'	✓	✓	✓	✓
3	IRP582, 'Read ALCS Event Log values'	✗	✓		
4	IRP603, 'Security Log display over HAN'	✗	✓	✓	✓

Table 2: IRP Impacts for Each Service Provider

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

3.2 DSP Solution

3.2.1 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.

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.

3.2.2 IRP554

The Future Dated command handling guidance for CS02b and CS06 are not consistent across different sections within the GBCS specification. IRP554 proposes to standardise it. It clarifies that, for the above mentioned Use Cases, if the executionDateTime is in the past the Command is to be executed immediately and a Response and an Execution Alert are to be generated immediately.

This revised Device behaviour makes it very likely that DCC Data Systems will receive the Execution Alerts before the Response for CS02b and CS06. This will need changes to the way the Motorway processes the Responses and Execution Alerts resulting from a Device

Future Dated Execution. The SAT Log recording behaviour will also need to be amended to handle this.

Currently, the messages from the Devices are forwarded to the Service User in the order received. The Responses are expected to arrive before the Execution Alert. On receipt of the Response, the transaction status is recorded as 'Delivery to Meter' in the SAT Log. On receipt of the final Execution Alert, the transaction will be recorded as 'Complete' in the SAT Log.

If the Response for CS02b or CS06 is received after the Execution Alert then the transaction status will need to be recorded under a new status in the SAT Log. This new status will need to be excluded from the SLA calculations (since the SLA applies to delivery of the Execution Alert). This new status shall also be ignored by SSI while showing the final status to the Service Users.

3.3 Critical Software Solution

There will be an impact on to reflect the new GBCS, including GBCS Use Cases as noted following. [1]

Changes will be required to implement this Modification provided by Critical Software.

3.3.1 Parse and Correlate

Changes to the Parse and Correlate application will include:

- Updating the ECS35f and ECS35g use cases
- Adding test cases to exercise the changes
- Documentation updates and release tasks

3.3.2 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 **IRP554**, GFI will need to update the GBCS use cases to support command handling if activation in the past, namely the following tasks:

- Enhance the GFI Testing Tool to support the use cases handling on GFI Testing Tool

[1] Critical seemed to think they are changes required to the DUIS and MMC schemas, but it does not appear to be the case. For now, these references have been removed from the PIA.

- Enhance the GFI CH to support the use cases
- Implement support for the use cases on RTDS

To meet the requirements specified in **IRP582**, GFI will need to update ECS35f, namely the following tasks:

- Enhance the GFI Testing Tool to support ECS35f
- Update the use case on RTDS;
- Enhance Triage Tool to support the new use cases

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.

3.3.3 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.
IRP554	No effort required - only the decision from devices to when to send or not future dated alerts will change.
IRP582	Add integration/system tests for use cases ECS35f and ECS35g and review tests.
IRP603	No effort required – this will only affect 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.

3.4 Communication Service Provider (CSP) Changes

Design and build activities to support the following will be required for both CSPs:

- Comms Hub; Assessing the impact to the Communication Hub, update and up-issue any new versions of Technical Specifications including GBCS, CHTS.
- The Smart Meter Wide Area Network (SMWAN), for CSP North potentially both the Regional Area Network (RAN) and Regional Network Interface (RNI)
- CHM; Assessing the impact to CHM 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.

4 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.

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.

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.

4.2 Request Management

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

4.3 Data Management

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

4.4 Transform

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.

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

4.5 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.

4.6 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 integration (PIT) testing of the Modification are included in this PA. The costs exclude release based regression testing in SIT and UIT.

The Integration teams will prepare and execute tests related to IRP554 to verify the behaviour of the execution of CS06 and CS02b Commands that contain ExecutionDateTime values in the past.

4.7 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.

4.8 Application Support

No changes to Application Support are expected.

4.9 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.

4.10 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).

4.11 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)

5 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 between 3 and 6 months following the provision of full commercial cover. Communication Service Provider (CSP) implementation will be between 8 – 12 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 2021.

Please note that if any of the assumptions identified in section 7.2 are not valid then one or more of the Service Providers might need to submit a new Preliminary Assessment with revisions to the associated charges.

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 full impact assessment. The standard ongoing major release model will provide drops to the production environment in June and November each year.

5.2 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 and CHM for implementation of IRPs
- Platform Build; Assessing impact on Platform Build requirement

CSP South and Central have identified the following testing tasks:

- Creation of additional PIT test scenarios to cover IRP554 and IRP603
- Regression testing on firmware for all 16 Communication Hub (CH) variants
- Deployment and testing of the changes within this CR within Telefónica's PIT environment in accordance with the existing PIT Approach document
- Deployment of this firmware to the PIT environment.

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 performance testing within the PIT environments.

The Rough Order of Magnitude cost (ROM) shown below describes indicative costs to implement the functional requirements as assumed now. 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
Phase ROM	1,700,000	n/a	n/a	n/a	n/a	1,700,000

Note a substantial part of both the above cost and the FIA development cost given below are associated with one Service Provider. DCC believe that the quoted cost is not appropriate and will be reviewing the provided figures.

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.

Based on the existing requirements, the fixed price cost for a Full Impact Assessment is **£274,860** 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	Accept?
MP78-RA01	Scope	Any changes to the scope or interpretation of the items in scope will require re-assessment	
MP78-RT01	Defects	There is a risk that incorporating this Modification as part of a firmware maintenance release will, should defects be identified related to this Modification, block the progression of maintenance fixes. For any Severity 1 or 2 defects based on this Modification: - Telefónica would cease any further testing of this release - an engineering release would be developed containing only fixes to the Severity 1 or 2 defects for re-test in the environment that the defects were identified, subject to the engineering release development not impeding any further planned release - defect fixes for Severity 1 or 2 defects would be incorporated into the next maintenance release For any Severity 3, 4 or 5 defects introduced as a result of this Modification, Telefónica would continue to progress with testing this release. Defect fixes for Severity 3, 4 or 5 defects are to be considered for inclusion in future releases in accordance with the release planning process as part of the firmware management policy.	

7.2 Assumptions

Ref.	Area	Description	Accept
MP78-AD01	Critical	Parse and Correlate changes will be applied to the D3-G3-x branch	
MP78-AD02	Critical	SMITEn changes will be applied to the smets2-instruments-smiten-lite-gbcs-v3 branch	
MP78-AD03	Critical	A new version of Parse and Correlate will be required to implement this Modification.	
MP78-AA04	Release	The delivery of this Modification will be aligned to a DCC Release	Accepted but does not impact PIA
MP78-AA05	CHF	Arqiva assumes that the changes to the CHF Security Log could impact the CHM. This to be established in the FIA	

MP78-AA06	GBCS Version	This PIA is based on the GBCS v2.0 Draft 5	Accepted, but the FIA should be based on DUIS 3
MP78-AA07	Emulators	PIT testing will use stubs (emulators)	Accepted for the PIA, but the aim is to use actual devices in future
MP78-AT08	Environments	Telefónica assume that the environments used to prove the CH firmware delivery of this Modification will be determined at the point of availability to release into the PIT and SIT environments and will be based on: - Whether the PITB, SITB, and UITB environments are expected to endure for the period of testing this Modification - whether the PITA, SITA and UITA environments are expected to be available at the times expected within the delivery plan for this Modification Note that it is highly likely that the 'A' stream environments will be used to assure this Modification.	Accepted, but not relevant to PIA
MP78-AT09	Defect	Assume that incorporating this Modification as part of a firmware maintenance release will, should defects be identified related to this Modification, block the progression of maintenance fixes. For any Severity 1 or 2 defects based on this Modification: - Telefónica would cease any further testing of this release - an engineering release would be developed containing only fixes to the Severity 1 or 2 defects for re-test in the environment that the defects were identified, subject to the engineering release development not impeding any further planned release - defect fixes for Severity 1 or 2 defects would be incorporated into the next maintenance release For any Severity 3, 4 or 5 defects introduced as a result of this Modification, Telefónica would continue to progress with testing this release. Defect fixes for Severity 3, 4 or 5 defects are to be considered for inclusion in future releases in accordance with the release planning process as part of the firmware management policy.	
MP78-AT10	PIT Approach	Assume that the scope of the PIT Approach uplift that is required to support this Modification is limited to changes that are required to assure the IRPs defined	
MP78-AT11	PIT Approach	Assume there will be a single iteration of software required for this Modification from the Communication Hub vendors. The delivery plan for this release therefore will have a single iteration.	

MP78-AT12	DUIS	Assume the DUIS schema version used for the CSP Management interface will not be required to increment because of this Modification. If this is not the case, then there will be additional effort to load the updated DUIS schema into Telefónica systems and to regression test this functionality in PIT.	Accepted, no DUIS change required
MP78-AT13	Firmware Changes	Assume 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-L release operating in parallel with the maintenance release process.	
MP78-AT14	Test Tools	Assume there is no additional design, build and system test modifications to Telefónica test tooling required to assure the Telefónica CSP solution within Telefónica PIT and therefore have not factored any effort / cost in the ROM. However, if changes are required with PIT meter and DSP emulators, this will be included in the FIA.	Accepted
MP78-AT15	GBCS and CHTS	Assume incorporation of these IRPs into the SEC will not result in an uplift to the applicable GBCS and CHTS specifications, and should this change, Telefónica reserve the right to include additional work relating to specification compliance in the FIA.	

7.3 Issues

Ref.	Area	Issue	Impact
MP78-CD01	Release	As the future releases are being managed as a series of separate Modifications, Telefónica (and the other SPs) are having to price for each Modification independently and in isolation. The result of this is that the aggregation of the charges across each Modification will appear more expensive than if there was one consolidated Modification for the release. It is likely that there will be resources used across all the June 2021 Modifications but as we are treating them independently, those resources will have duplicated charges in each separate Modification.	Accepted but no impact to PIA

7.4 Dependencies

Ref.	Area	Dependency	Impact
MP78-CD01	Critical	GFI will require new versions of the Parse and Correlate application to implement these changes.	Med
MP78-AD02	Tech Specs	New versions of the GBCS and CHTS documentation must be provided to the SPs before delivery commences.	Med
MP78-TD03	CSP	There may be a dependency on the completion of any CSP-related Release 2.0 Change Requests or other activities. This will be determined when Release CR raised.	Med
MP78-TD04	CSP	Telefónica has a dependency on DCC-L to confirm that a firmware maintenance release containing the SEC technical specification changes associated with this Modification can be deployed into Production prior to any development commencing on this Modification.	Telefónica will be unable to deploy the firmware delivered under

			this Modification in Production.

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
HCALCS	HAN Connected Auxiliary Load Control Switch
IRP	Issue Resolution Proposal
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing
RAN	Regional Area Network
RNI	Regional Network Interface
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
SMWAN	Smart Meter Wide Area Network
SP	Service Provider
SR	Service Request
SRV	Service Request Variant
SSI	Self Service Interface
TTO	Transition to Operations
UIT	User Integration Testing