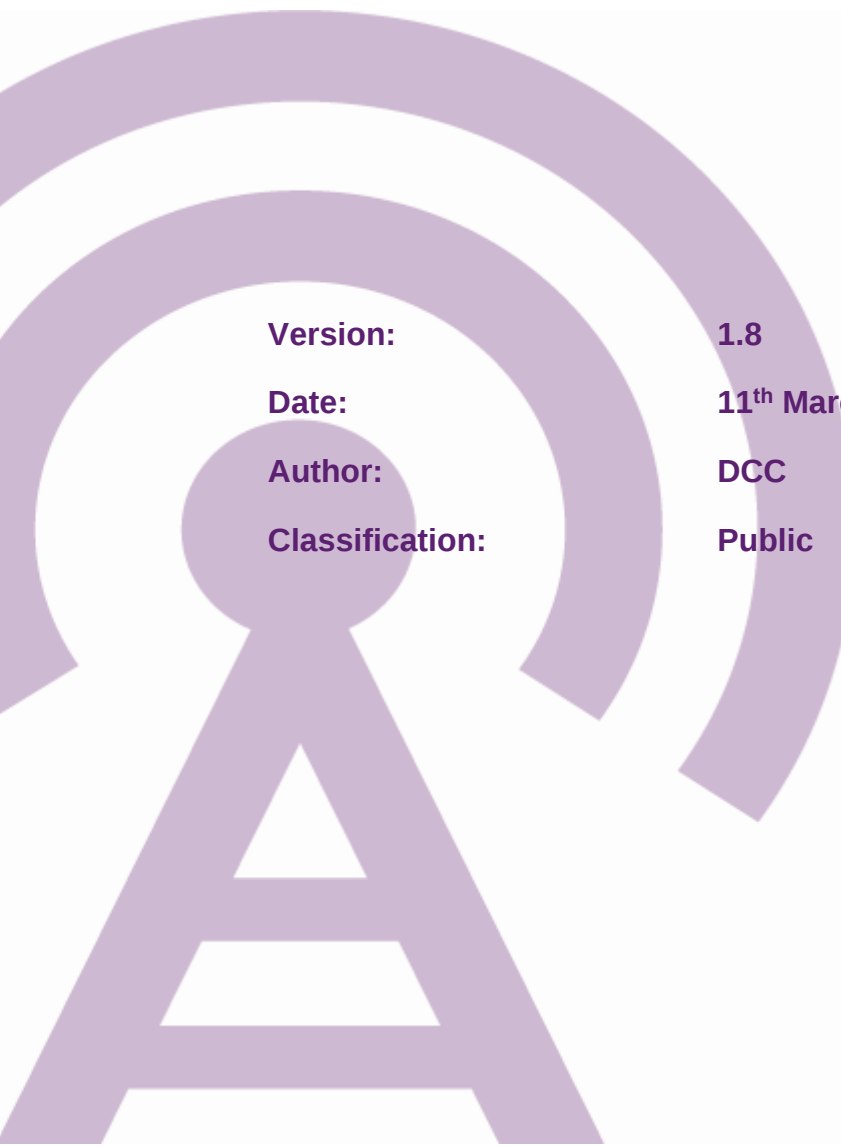


SEC Modification Proposal, SECMP0015

GPF Timestamp for Reading Instantaneous Gas Values

Full Impact Assessment (FIA), DCC CR213 and CR1197



Version:

1.8

Date:

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Author:

DCC

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1 Document History

1.1 Revision History

Revision Date	Revision	Summary of Changes
21/5/2018	0.1	Initial compilation from Service Providers
24/5/2018	0.2	Internal DCC Review
8/6/2018	1.0	Included all review comments
8/8/2019	1.1	Updated GCS60 to be replaced with GCS60a, completed RAID, ready for re-estimate of testing costs
16/8/2019	1.2	Added testing assumptions
16/10/2019	1.6	Included SIT, UIT and Implementation costs, CR1197
2002/2020	1.67	Updated costs and created separate ANNEX document
11/03/2020	1.8	Added updated DUGIDS document from the DSP

1.2 Associated Documents

This document is associated with the following documents:

#	Title and Originator's Reference	Source	Issue Date
1	SECMP0015 - GPF timestamp - Solution Design Document	https://smartenergycodecompany.co.uk/modifications/sending-commands-via-ppmids/	16/10/2017
2	SECMP0015_DCC_PA	DCC Document	23/03/2017

1.3 Document Information

The original Business proposer for this Modification was Tim Newton.

This DCC Full Impact Assessment was requested of DCC, and the Service Providers instructed to proceed with their submissions on 7/9/2017. However a change in the requirements, and a SECAS request to provide standalone testing costs meant that the document was reissued in August 2019, and the new Service Provider information and estimates was sent back to SECAS in October 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

Instantaneous Gas Smart Metering Equipment (GSME) register values can be read from the Gas Proxy Function (GPF). These will not normally be in-line with the readings on the GSME, since the GSME only provides intermittent updates to the GPF, typically once every 30 minutes.

When reading these attributes from the GPF the date-time field in the response is set to the GPF read time and not the GSME consumption measurement time. Without a timestamp to know when the GSME last updated the GPF, the Supplier cannot know the currency of the information.

In order to provide accurate information to the suppliers, this change proposes that a GSME shall make the time at which an *instantaneous* register is updated available to the GPF whenever the register values are shared with the GPF. When GPF creates Responses to the corresponding use cases, it shall populate date-time stamp value with the value received from GSME and specify the source (indicates whether the value is from GSME or GPF) of the date-time stamp. The value held by the source field will be used to validate the reliability of the date-time stamp in the Critical Software Parse and Correlate application.

In summary, this Modification helps inform the gas suppliers of the currency of the instantaneous register values.

2.2 Requirement

The functional requirements for SECMP0015 as stated in the initial solution design [1] are as stated following. This Modification allows Remote Parties and Devices reading the instantaneous values from the GPF to know what the time was on the GSME's Clock to which those values relate. Specifically:

- The GSME is to provide to the GPF a date-time stamp value whenever the GSME provides its instantaneous values
- The GPF is to update its copy of this date-time stamp whenever it updates its copy of the GSME's instantaneous values
- The GPF is to make available its copy of the GSME date-time stamp to Devices on the SMHAN
- When the GPF creates a Response to GCBS Use Cases GCS13a, GCS13b, GCS13c, GCS14 or GCS60¹, the GPF is to use its copy of the GSME date-time stamp to populate the date-time field in the Response it generates, and mark the source of that date-time stamp in the time status of the Response accordingly
- Parse and Correlate is to decode the time status in Responses so that GSME sourced date-time stamps are flagged, along with (as an option) a decoding as to whether the date-time is (1) reliable, (2) unreliable or (3) invalid.

¹ See section **Error! Reference source not found.** and Appendix A – GBCS Changes for changes

3 Solution Overview

The Communications Hub GSME mirror will be updated to mirror the GSME 'Reading Snapshot Time' and GPF will populate the Use Cases with 'Reading Snapshot Time'. As the change is populating a field that already exists there are no structural changes to the relevant schemas. Backward compatibility is maintained, so there is no impact beyond those listed in the Communications Hub sections below.

The mechanism using which the Timestamp values are populated in the Device Responses corresponding to the following Service Request Variants (SRVs) will undergo modifications due to this change.

- 4.1.1 Read Instantaneous Import Registers
- 4.1.2 Read Instantaneous Import TOU Matrices
- 4.1.4 Read Instantaneous Import Block Counters
- 4.3 Read Instantaneous Prepay Values
- 4.18 Read Meter Balance

3.1 Communication Hubs Changes

The major impact of SECMP0015 to services is on the Communications Hub (Comms Hub), through an uplift of the r2.x Communications Hub firmware codebase to support the time stamping of GSME instantaneous values. These will be implemented by the CSPs.

The Comms Hub will require changes to the GSME mirror to make the attribute available on the HAN, and GPF functions both to record to record a value of the 'ReadingSnapshotTime' attribute provided by a GSME on the connected HAN attribute and to populate the date-time field in the responses for the specific GBCS use cases. This will also impact the Parse and Correlate component.

3.1.1 Mirror Reading Snapshot Time

The ReadingSnapshotTime attribute is optional, and represents the last time all of the Current Summation Delivered, Current Summation Received, Current Max Demand Delivered, and Current Max Demand Received attributes supported by the device were updated. The default value shall be 0xFFFFFFFF.

It is expected this will be updated by the GSME every time the GSME data is mirrored from GSMEs that support this Modification. The CH will support GSMEs that both implement and do not implement this SEC Modification. Test cases shall be added that cover meters that both support and do not support this optional attribute.

The GSME mirror shall make this attribute available to devices on the HAN. If the attribute is read when it has not been populated the response status 'unsupported attribute' shall be returned.

Note: the SEC solution design document [1] proposed the attribute shall be set to 'invalidTime' as opposed to 'unsupported attribute' as defined by ZigBee. This should be implemented to match the GBCS/CHTS update.

3.1.2 Populate Identified Use Cases Timestamp Field

When the GPF creates a Response to Use Cases GCS13a, GCS13b, GCS13c, GCS14 or GCS60a, the GPF shall use its copy of the GSME date-time stamp to populate the date-time field in the Response it generates if available. If the GSME date-time stamp is null or not available, the current time shall be used. The source of the timestamp shall be used to indicate the GSME consumption time or the CH current time.

The Time Stamp 'bit 2' element will be set to 1 for data from the GSME and 0 for the CH. The GBCS section 7.2.7, "Message construction – Grouping Header", specifies the message construction for the above mentioned GBCS messages.

All the affected messages will require the 'Date-time stamp in response' as specified in the column Z of tab 'Use Case Reference' of GBCS section 20 mapping table.

3.2 DUIS, DUGIDS and MMC

The DCC User Interface Specification (DUIS) is expected to remain unchanged. The DCC User Gateway Interface Design Specification (DUGIDS) and Message Mapping Catalogue (MMC) will require changes; as described following.

3.2.1 DUIS, DUGIDS and Related GBCS Changes

The description of the following SRVs in DUGIDS shall be updated to reflect the behaviour of the timestamp field.

- 4.1.1 Read Instantaneous Import Registers
- 4.1.2 Read Instantaneous Import TOU Matrices
- 4.1.4 Read Instantaneous Import Block Counters
- 4.3 Read Instantaneous Prepay Values
- 4.18 Read Meter Balance

The structures of these SRVs are not expected to change and hence there will not be any changes to the DUIS XML Schema Definition.

The GSME GBCS Use Case associated with SRV 4.18 will be changed to GCS60a from GCS60; however the input parameters do not change. In this case the definition of the Service Requests within the DUIS schema requires no changes, but DUIS will be uplifted to a new version to support the new GBCS version. It shall be noted that the Service Users shall be able to send SRV4.18 using the old DUIS version and, where supported by the Device, DCC Data Systems will transform the request to the new GBCS case.

DUGIDS will be updated to describe the new behaviour for the benefit of the Service Users and other applications including Parse and Correlate. [An illustrative example of the changes required to DUGIDS is available in the](#)

extract embedded below. A complete version of DUGIDS will be developed by the DSP during the Design phase.



CR1197 DUGIDS
Extract v0.3.docx

The structures of these SRVs are not expected to change and hence there will be no changes to the DUIS XML Schema Definition.

3.2.2 MMC Changes

The MMC XML Schema Definition shall be modified to add two new optional attributes to the existing timestamp field within the Response Header:

IsFromGSME	If the IsFromGSME attribute of the Timestamp in the Response is set to True, then this indicates that the value of Timestamp is set by the GSME, not the GPF.
ClockStatus	Indicates if this time is RELIABLE, UNRELIABLE or INVALID.

The Service User Simulator (SUS) will need to integrate the new MMC schema to ensure that the implementation is consistent with that of the Parse and Correlate software.

3.3 Transform Libraries

Transform will build the library for the new GBCS Use Case GCS60a, which will be based on the GCS60 implementation.

3.4 GBCS Changes

The following GBCS use case and message responses shall be updated:

- GCS13a Read GSME Consumption Register
- GCS13b Read GSME Block Counters
- GCS13c Read GSME Register (TOU)
- GCS14 Read GSME Prepayment Register(s)
- GCS60 Read Meter Balance for GSME, will be replaced with GCS60a

Changes to the use cases are covered in detail in Appendix A – GBCS Changes on page 25.

3.5 Parse and Correlate Application

Parse and Correlate will provide a solution to read the Grouping Header date-time field from the responses and decode bit 2 of that field, which corresponds to the 'time status', to flag where date-times came from the GSME rather than the CH. Parse and Correlate would also decode bits 0 and 1, in line with GBCS Table 9.1.4.2b and flag that date-time as (1) reliable, (2) unreliable or (3) invalid.

As noted above, a new MMC schema with all the relevant changes for this solution needs to be supplied and applied to Parse and Correlate.

3.6 Critical Software GBCS Integration Testing For Industry (GFI)

The GFI Testing Tool and GFI Comms Hub will be impacted by this Modification.

The GFI Testing Tool will require the following changes to its GPF data structures:

- Add the attribute ReadingSnapshotTime to the GPF data structures
- Initialize ReadingSnapshotTime on the GPF with 0xFFFFFFFF (invalid value)
- Support mirroring of ReadingSnapshotTime by a GSME sending a Report Attributes command
- Expose ReadingSnapshotTime to devices on the HAN

GPF response construction will also need to be updated for the use cases GCS13a, GCS13b, GCS13c, GCS14 and GCS60a in order to correctly set the Grouping Header date-time:

- If the GPF ReadingSnapshotTime is invalid, date-time will be set to the GFI CommsHub system time, and the status field will indicate the value as unreliable and as having the same source as the response
- If the GPF ReadingSnapshotTime is invalid, date-time will be set to the value of that attribute, and the status field will indicate the value as reliable and as having a source different from the source of the response

The test reports produced by GFI will also be enhanced to display the Grouping Header date-time status information.

The GFI GSME emulator will require improvements to validate the changes required by this Modification. These improvements will include the ability for the GSME emulator to act both as a device that mirrors ReadingSnapshotTime and a device that does not mirror that attribute.

The solution described above will allow the GFI GPF to work with Gas Meters capable of mirroring ReadingSnapshotTime as well as GSMEs that do not mirror this attribute.

A change in the GBCS mapping table that sets the grouping header date-time field as mandatory for use case GCS60a will be required.

Is also assumed that a given GSME will have a consistent behaviour regarding the mirroring of ReadingSnapshotTime when mirroring Instantaneous GSME register values. It will either always report ReadingSnapshotTime or never report it. Although an inconsistent behaviour will not prevent the use of GFI it may cause the GFI GPF to provide misleading information both to remote parties and to devices on the HAN.

4 Impact on DCC Systems, Processes, and People

This section describes the impact of SECMP0015 on DCC's Services and Interfaces that impact Users and/or Parties.

4.1 Solution Infrastructure

No additional infrastructure will be required.

4.2 Impact on Safety

This change does not affect the processing, storage or transmission of data within DCC Data Systems. No new types of hardware infrastructure are required to be procured or installed as a result of this change and, therefore, there is no foreseeable HSE impact. The proposed functionality will be accommodated within existing infrastructure which have already been subject to assessment.

4.3 Impact on Consumers

Consumers will not be impacted, but there will be benefits to the addition of this metadata, including considerations around Pre-payment and emergency credit calculations.

4.4 Modification Deliverables

The changed documents and deliverables for SECMP0015 are as described in the table below.

Deliverable	Changes Required
SD4.1 DCC User Gateway Interface Design Specification	DUGIDS Updates required to Annex 4.
SD4.1.19 MMC XML schema	MMC Changes to support the new functionality
Communications Hub Detailed Specification (CHDS) CH02	CHDS will be uplifted to include new commands with PIT Test Approach
Communications Hub Technical Specification (CHTS)	CHTS will be uplifted to include new commands with PIT Test Approach
Parse and Correlate Application	CRITICAL Software Changes: Use Case Specifications Test Approach Test Case Specifications Test Reports Installation Document Software Architecture Specification API Release Notes Traceability Matrix Release Notes

Deliverable	Changes Required
GFI Software	CRITICAL Software Changes: Installation Document, and Release Notes
Released based test artefacts (Test Plans, Heatmaps, new/updated test scenarios etc.)	This Modification will contribute to Release based test artefacts

4.5 Impact on Security

This section describes the impact the DCC considers SECMP0015 will have on the Security of the DCC's Total System.

DCC has carried out a security risk assessment for SECMP0015 and determined that there is no change to the security model as a result of the planned Modification.

4.6 Transition to Operations (TTO) Approach

No TTO-specific charges have been included in this FIA on the basis that it is relatively small. It is assumed that other larger or more complex November 20 CRs will include partial provision for TTO and that the overall release CR will address any collective shortfall.

4.7 Application Support

The Application Management Support team are responsible for the provision of application level support for the DCC Data System application.

It is not expected that this new functionality will result in an increase in service calls.

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 2020 (although 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 Arqiva (5 Single Band CH, 5 Dual Band CH), 20 for Telefonica (same split per band, but two meter manufacturers).
- Full 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 SEC Mod is allocated to is finalised; that cost will apply to the release and not to an individual SEC Modification.

Note there is no requirement for CHM and BSS 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

Pre-Integration Testing (PIT) estimates are subject to a PIT environment being available for this testing to be carried out. The Communications Hub change testing will be limited to PIT testing of the new functionality outlined in this Modification as well as PIT regression testing. PIT System Comms Hub testing will consist of 2 cycles of testing of the new functionality delivered by this Modification, plus 2 cycles of regression testing. A repeat of a subset of PIT System test cases will be conducted for DCC Test Assurance witnessing.

When the software has been deployed into PIT, it may be possible to operate the following phases of testing in parallel:

- Devices Acceptance testing
- Networks testing
- System testing

Device testing focuses on both acceptance testing new releases from the CH manufacturers, the testing of physical aspects of the Communication Hub and the testing of core functionality relating to start up and initial operation.

Networks testing focuses on how the Communication Hub interacts with the SMWAN.

System testing focuses on how the Communication Hub interacts with the CSP systems including:

- GBCS message processing
- Firmware distribution
- Device management related functionality including power outage processing

Multiple PIT teams may be engaged operate in parallel to minimise the duration of the overall testing phase.

5.2 System Integration Testing and User Integration Testing

The DSP SIT team will create a set of test scenarios to validate the new functionality introduced by the new Use Case GCS60a and to include SRs 4.1.1; SR4.1.2; SR4.1.4; 4.3 and 4.18. SIT effort also includes also regression testing of the affected functional areas and supporting CSP testing.

The DSP UIT Test team will prepare and execute the necessary tests to verify a successful deployment of the changes has been completed in the UIT environment. UIT resources will then be available to support service users with their own user testing activities in a two (2) calendar month period. The DSP UIT support for CR1197 is expected to be part-time throughout this period.

This particular change will require UIT environments to undergo specific post-deployment verification of some key components (Service User Simulator incorporating the new version of Parse and Correlate) in addition to other standard deployment checks that are part of this change.

CSP test lab support will be required to Permit the System Integrator (CGI SI) to execute the SI regression test pack for System Integration Testing (SIT) and User Integration Testing (UIT). The same support will provide triage and defect resolution activities during any SI managed integrated testing.

5.3 Framework and Testing Tools

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

- Update to testing framework to verify and validate the backward compatibility use cases
- Update to test support tools to support upstream and downstream mechanism limits / no limits
- Update the PIT meter Test Stub capability to assure the Modification Communication Hub software uplift

5.4 Reference Test Data Set (RTDS)

The RTDS data set will be updated with the following changes:

- New GBCS payloads for the use cases GCS13a, GCS13b, GCS13c, GCS14 and GCS60a run on a GPF. These payloads will include a mix of examples where the GPF returns the GSME timestamp (reliable date-time) and its own timestamp (unreliable date-time).
- Update of existing GCS60a payloads to include the Grouping Header date-time.
- New and updated DUIS and MMC examples for SRV 4.1.1, 4.1.4, 4.1.2, 4.3, and 4.18 matching the payloads mentioned above.

It is assumed there will be a change in the GBCS mapping table that sets the grouping header date-time field as mandatory for use case GCS60a.

6 Implementation Timescales and Releases

This Modification was expected to be included in a SEC release in November 2020. 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 **13 months**.

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

Phase	Start	End
SECAS agreement on scope of release	Decision Date (D)	
CAN signature	D + 1 Month	
PIT Phase	D + 1 Month	D + 6 Months
SIT Phase (functional changes only)	D + 6 Months	D + 10 Months
UIT Phase (functional changes only)	D + 11 Months	D + 12 Months
Transition to Operations and Go Live	D + 12 Months	D + 13 Months

For the CSPs, the testing cycles follow the pattern described in section 5.1 onwards with two PIT cycles, an additional cycle of defect fixes, and two SIT cycles.

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	Build	PIT	SIT	UIT	TTO	App. Support	SP Total
Phase Total	244,695	583,985	1,187,698	708,588	651,239	121,718	90,701	4,596,044

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.
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.

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).

There are modifications in the contract schedules required to support the changes in this Modification (*impacted Service Provider(s) shown like this below*):

Schedule 2.1: (CSP) For update to DSP Functional Requirements

Schedule 2.3: (CSP) The GBCS version in schedule 2.3 is to be updated

Schedule 4: (CSP) Technical requirement details to be added to this Schedule.

Schedule 6.1: (DSP, CSP) Consideration for updates to DSP Milestones if this change is to be implemented outside of the standard release cycle;

Schedule 7.1: (DSP, CSP) For updates to payments linked to milestones and Operational charges.

Schedule 11: (CSP) Technical requirement details to be added to this Schedule along with references to updated specification documents.

Schedule 12: (CSP) To reflect the uplifted GBCS specification version.

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.

RAID and Clarifications already considered in the PIA have been rolled up into



PIA RAID.docx

the attached file:

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.	Accepted. DCC needs to secure and refresh as appropriate.

	The Arqiva 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 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 and Central's (Arqiva) 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. Arqiva'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 Arqiva of changes known to Arqiva 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, EDMI 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. Should this scenario occur and there are no Severity 1 or 2 defects related to the scope of this Change Request, CSP South (Telefonica) expect DCC-L to: - 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	Open
SIA15-T-R2	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.	Accepted. Design reviews and workshops will cover in detail each aspect of the change.

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-A1	The costs included in this IA response are based on the assumed scope/timescales as provided by DCC in this Modification. If these change, the Service Providers reserve the right to reassess the impact of this Modification.	Accepted, but no charges will be made for this work.
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 Arqiva'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.	Open
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 Change Request.	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: - CR1197 (Modification) compliant test stub and CR1197compliant CH - Non- CR1197 compliant test stub + CR1197 compliant CH.	Open
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.	Open

SIA15-T-A3	Assume 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 / UITB environments are expected to endure for the period of testing - whether the PITA, SITA and UITA environments are expected to be available at the times expected within the delivery plan	Open
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: - Proving via PIT testing that the GPF is able to record a value of the ReadingSnapshotTime attribute provided by a GSME; - Proving the GPF can populate the date-time field in the responses for the GBCS use cases listed	Open
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.	Open
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	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. Whilst Telefónica 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.	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-D3	Telefónica has a dependency on DCC-L raising purchase order cover upon acceptance of this Impact Assessment such that Telefónica can progress with the delivery of this Change Request beyond any previously agreed commercial cover.	Telefónica will be unable to meet the delivery timeframes included in this Impact Assessment.	Rejected. PO Cover will be raised when the Modification is approved by SECAS, and the release plan is completed.
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.	Telefónica will be unable to incorporate the defect fixes into the specified release	Accepted
SIA15-T-D5	Telefónica is dependent on DCC-L organising a workshop with CH vendors, BEIS and DCC to walkthrough the changes to the specification to identify and resolve any areas of specification misinterpretation that may delay this release	Telefónica will revise the pricing associated with SIA15-T-R2 if there are any specification interpretation issues that result in additional or wasted costs for Telefónica.	Partially accepted. Design reviews and workshops will cover in detail each aspect of the change.

Appendix A – GBCS Changes

This SEC Modification is designed to allow Remote Parties and Devices reading the instantaneous values from the GPF to know what the time was on the GSME's Clock to which those values relate.

The solution requires the GPF to create Responses to Use Cases GCS13a, GCS13b, GCS13c, GCS14 and GCS60 and use its copy of the GSME date-time stamp to populate the date-time field in the Response.

The date-time stamp is part of the Grouping Header defined in GBCS Section 7.2.7 'Message construction – Grouping Header'. GBCS Table 7.2.7 details: 'Where date-time is required for a Message, it shall be a 12 octet string as per the DLMS specification. See 'date-timestamp in response' column, 'Use Case reference' tab in Mapping Table'.

Figure 1 below illustrates the date-time stamp in the Grouping Header.

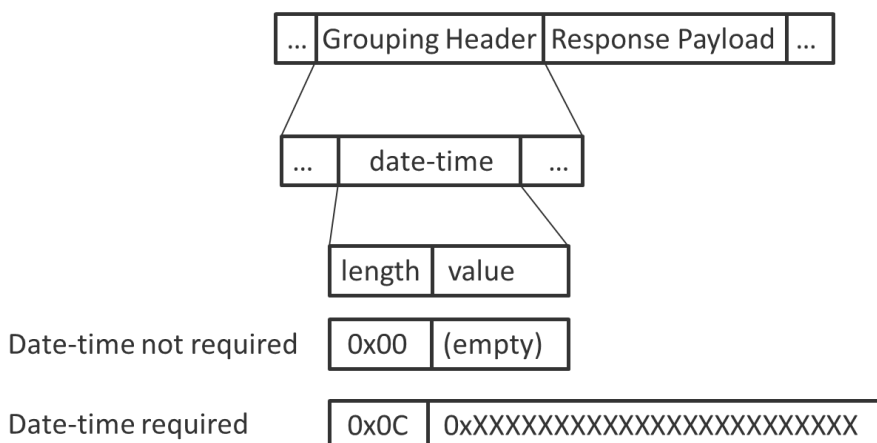


Figure 1:Date-time stamp in Grouping Header

The settings in the Mapping Table 20 mandate Use Cases GCS13a, GCS13b, GCS13c, GCS14 to include the date-time stamp in the Response; however for the Response to Use Case GCS60 the date-time stamp is currently not mandated.

The documentation in GBCS Mapping Table 20 is consistent across different version of GBCS; Table 1 below shows an extract of Mapping Table 20 with Use Case GCS60 being highlighted:

<i>Use Case Name</i>	<i>DLMS/AS N.1 message Location (1= in html)</i>	<i>Use Case (DLMS/ASN.1)</i>	<i>Message Code</i>	<i>GBZ message Location (1= in html)</i>	<i>Use Case (GBZ)</i>	<i>Message Code (gas)</i>	<i>Date-timestamp in response</i>
Read Import Energy / Consumption Registers	1	ECS17b Read ESME Energy Registers (Import Energy)	0x0027	1	GCS13a Read GSME Consumption Register	0x0074	Y
Read Energy / Consumption Register (TOU)	1	ECS17d Read ESME Energy Register (TOU)	0x0029	1	GCS13c Read GSME Register (TOU)	0x00B6	Y
Read GSME Energy Register (Block Counters)				1	GCS13b Read GSME Block Counters	0x00B8	Y
Read Prepayment Registers	1	ECS19 Read ESME Prepayment Registers	0x002D	1	GCS14 Read GSME Prepayment Register(s)	0x0075	Y
Read Meter Balance for Smart Meter	1	ECS82 Read Meter Balance for ESME	0x0069	1	GCS60 Read Meter Balance for GSME	0x008D	

Table 1: Existing requirements for the inclusion of the Date-time stamp in the Grouping Header for Use Cases GCS13a, GCS13b, GCS13c, GCS14, GCS60

As a consequence the implementation of SECMP0015 is possible for GCS13a, GCS13b, GCS13c, GCS14 as per the original solution design document; it is not possible for GCS60 due to the date-time stamp being not populated in the Grouping Header.

An alternative implementation is needed to support the desired functionality for GCS60.

Amended Solution

In order to include the functionality provided by Use Case GCS60 in the solution the following approach shall be taken:

1. Use Case GCS60 shall be deprecated;

2. a new Use Case GCS60a with a new GBCS Message Code shall be introduced;
3. the parameters of Use Case GCS60a shall be those of Use Case GCS60;
4. in addition Use Case GCS60a shall contain a 'Y' in the column 'date-timestamp in response', 'Use Case reference' tab in Mapping Table 20; and
5. Use Case GCS60a shall be added as a new line in Mapping Table 20.

These changes shall be documented in a new version of GBCS.

Implementation Impact

The sending of the Use Case GCS60a Command is similar to the sending of the existing GCS60 Command; minor changes are required to support Use Case GCS60a on the Supplier and DCC systems.

With regards to Responses from devices to the Command containing the Use Case GCS60a, the changes listed above will impact devices and processes due to the inclusion of the date-time stamp in the Grouping Header of the message:

- The GPF must support the new Use Case GSC60a.
- The GSME must support the new Use Case GCS60a.
- A new version of DUIS is required to include Use Case GCS60a.
- A new version of MMC is required to include Use Case GCS60a.
- Parse and Correlate must support Use Case GCS60a.

This implementation approach preserves the Use Case ECS82 in its current format without the date-timestamp and therefore doesn't impact either the ESME or the DCC and Suppliers Systems.

Appendix B – Glossary

.Acronym	Definition
AMP	Assurance Maintenance Plan
BSS	Business Support System
CAN	Contract Amendment Note
CH, Comms Hub	Communications Hub
CHDS	Communications Hub Detailed Specification
CHM	Communications Hub Manager
CHTS	Communications Hub Technical Specification
CPA	Commercial Product Assurance
CR	DCC Change Request
CSP	Communications Services Provider(s)
DBCH	Dual Band Communications Hub
DCC	Data Communications Company
DSP	Data Service Provider
DUGIDS	DCC User Gateway Interface Design Specification
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
FIA	Full Impact Assessment
GFI	GBCS Integration Testing For Industry
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing
ROM	Rough Order of Magnitude (cost)
SBCH	Single Band Communications Hub
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SIT	Systems Integration Testing
SP	Service Provider
SR	Service Request
SRV	Service Request Variant
SUS	Service User Simulator
UIT	User Integration Testing