Stage 01: Initial Modification Report

SECMP0037:

Pairing Local PPMIDs

This modification seeks to remove the 60 minute limit requirement that Communications Hub (CH) currently have to allow Hand Held Terminals (HHTs) to join the Home Area Network (HAN) after power on. This is to give Suppliers the option of providing Prepayment Meter Interface Devices (PPMIDs) to their Consumers, that can join a HAN without requiring a reliable Wide Area Network (WAN) connection or engineer intervention.

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The recommendation is that this Modification Proposal should:
- follow Path 2: Authority Determined; and
- be progressed through the Refinement Process.

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Impact on:
- Data and Communications Company (DCC)
- DCC Users

Modification raised by:

Utilita Energy

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SECMP0037 Initial Modification Report

Content

About this document

This document is an Initial Modification Report (IMR). It enables the SEC Panel to carry out its initial consideration on how this Modification Proposal should be progressed through the Modification Process.

The Panel will consider this IMR at its meeting on 9th June 2017.

This IMR has one attachment:

- **Attachment A**: SECMP0037 Modification Proposal Form;

- **Attachment B**: SECMP0037 Working Group Terms of Reference

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SECMP0037 Initial Modification Report

1. Summary

This section provides an overview of SECMP0037. For further details on the Modification Proposal, please refer to subsequent sections. Defined terms and acronyms used in this document are listed in the Glossary (Appendix A) of this document.

1.1 Why Change?

Smart Metering Equipment Technical Specification 1 (SMETS1) meters use GB mobile telephone networks for their Wide Area Network (WAN) connections. SMETS2 meters have not yet been deployed in significant numbers, but those in two out of three Communication Service Provider (CSP) regions will also use the GB mobile telephone networks for WAN connections. Thus, WAN performance in SMETS1 deployments gives the best current indication of the likely SMETS2 WAN performance in two out of three CSP regions.

The Proposer (Utilita) has over 90% success with WAN, however they have found that over 9% of their SMETS1 meters continue to have an unpredictable quality of WAN coverage following install, even using roaming sim technology which will link into the strongest mobile phone network signal. This means that the meter has WAN intermittently and the WAN connection, to material numbers of Premises, is not sufficiently reliable to deliver configuration Commands in a sufficiently timely manner.

This modification is one of a pair of modifications that replace SECMP0031[1] to better support customers when faced with intermitted or no WAN situations. The purpose of this modification is to allow for such connection of PPMIDs where the WAN connection is not of sufficient quality to connect them remotely.

1.2 Solution

This modification proposes to remove the requirement on CH to apply the 60 minute limit.

1.3 Impacts and Costs

This modification will impact the DCC and DCC Users. SECMP0037 is expected to impact Communications Hubs as to remove the 60 minute limit. Only Suppliers who wish to use this mechanism would need to procure PPMIDs with the extra, optional functionality. No other Device Types would be affected.

The costs associated with implementing SECMP0037 will be identified as part of its progression through this modification process.

1.4 Implementation

The Proposer requests the implementation to be in the next release, where a CH firmware upgrade is included.

1.5 Proposed progression

The Proposer and SECAS recommend that SECMP0037 is progressed as a Path 2 'Authority Determined' Modification. We have considered the requirements set out in Section D2.6. We note that expected changes are not expected to be sufficiently material to require an Authority determination. This is because this modification seeks only to amend GBCS section/clause 10.5. It is also recommended that SECMP0037 should proceed to

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[1] SECMP0031 – 'Adding UTRN Functionality to SMETS'

the Refinement Process. This is because SECMP0037 is likely to impact DCC due to the modification requiring changes to Communication Hubs.

2. What is the issue?

2.1 Background

ZigBee supports an Inter-PAN mechanism which can be used for communication links between Devices, i.e. establishing a link key between the HHT and the Communications Hub (CH). The Inter-PAN link is then used for HHT to Communications Hub communication:

- the HHT uses the link to send its Entity Identifier and *Install Code* to the Communications Hub as part of a 'CCS01 Add Device to Communications Hub Function (CHF) device log' Command;

- the Communications Hub adds these details to the CHF's Device Log (so allowing the HHT to *join* the Smart Meter Home Area Network (SM HAN)) and confirms this to the HHT using a 'CCS01 Add Device to CHF device log' Response; and

- the HHT then joins the SM HAN and so can exchange Remote Party Messages within the Communications Hub, and the Communications Hub can relay them to / from the specified Device(s) on the HAN.

Inter-PAN Communications are only available for 60 minutes from power on of the Communications Hub.

The Department for Business, Energy and Industrial Strategy (BEIS) has previously consulted upon, and decided that it will not proceed with, a solution option to pair Consumer Access Devices (CADs) locally. That option would have involved changes to the firmware on Electricity Smart Metering Equipment (ESME) and CH, along with the consumer entering numerical values on the ESME keypad.

For the reason laid out by BEIS in its consideration of that solution option, it is not considered here in relation to PPMIDs either. Rather, the proposed solution is based on extending the local pairing mechanism already provided for in the Technical Specifications. Specifically, it relies only on removing a single time limit requirement from the Communications Hub.

This modification is a more refined version of SECMP0031, but achieves a similar outcome by providing some DCC Users with a mechanism of delivering critical commands to a meter where WAN is unreliable. Specifically, it is to allow a PPMID to join the HAN in such circumstance.

2.2 What is the issue?

Over the past few years, millions of SMETS1 meters have been deployed. They use the GB mobile telephone networks for their WAN connections. SMETS2 meters are not yet deployed in significant numbers, but those in two out of three Communications Service Provider (CSP) regions will also use GB mobile telephone networks for WAN connections. Thus, WAN performance in SMETS1 deployment gives the best current indication of the likely SMETS2 WAN performance in two out of three CSP regions. Utilita have found over 9% of their SMETS1 meters continue to have poor WAN coverage following install. This means that the meter has WAN

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intermittently and the WAN connection, to material number of premises, is not sufficient quality to deliver configuration Commands in a sufficiently timely manner.

The purpose of this modification is to allow for such connection of PPMIDs where the WAN connection is not of sufficient quality to connect them remotely. Utilita's current pairing process appears to be similar to the SMETS2 process, whereby the HAN would be opened, via a command over the WAN during the shipping time of the In-Home Display (IHD)/PPMID. Failure rates for this "open HAN" Command to the CH mirrors WAN success rates, about 2-3% failure.

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3. Solution

3.1 What's the solution?

The DCC has already implemented a technical solution to the problem of GBCS Command delivery other than via the WAN. It has the following component parts:

1. Communications Hubs are required to allow Devices to join the HAN using a GBCS specified mechanism which relies upon the ZigBee 'inter-PAN' mechanism. Currently, such joining is only allowed for 60 minutes from the initial power on of the CH. Any Device joining in this way is currently treated as a HHT by the CH and can only stay on the HAN for the lesser of 18 hours / the next CH power on.

2. Once a HHT has joined, it can deliver any GBCS Command to any Device on the HAN. Therefore, it can deliver (1) a 'CCS01 Add Device to CHF device log' Command to the Communications Hub Function (CHF) to add a PPMID the CHF Device Log, and then (2) 'Join' Commands to join the PPMID with the ESME / Gas Proxy Function (GPF) / Gas Smart Metering Equipment (GSME), as required by the Supplier. Assuming the PPMID is powered on and the process works over the HAN, this would allow a PPMID to be fully functioning without any Command being transmitted over the WAN.

3. Such CCS01 and 'Join' GBCS Commands for HHT delivery are requested by the Supplier when they submit the corresponding Non-Critical Service Request / Signed Pre-Command to the DCC[2]. For Non-Critical Service Requests, these are DUIS Command Variants 2[3] and 3[4]; for Signed Pre-Commands, they are Command Variants 6[5] and 7[6].

4. The Supplier transmits such GBCS Commands (which are numbers) to the HHT. This transmission can take place in any way the DCC User chooses (e.g. Wi-Fi pre-loading in a supplier facility).

Thus, there is an existing mechanism to add a PPMID to a SM HAN without relying on any WAN connection. However, it is currently too constrained to be usable except where the Supplier sends out an engineer. Specifically, the 60 minute limit from power on requires an engineer (CH power cycling being required).

This proposed change is to remove the requirement on CH to apply the 60 minute limit. In the view of the Proposer, this should be a straightforward change to CH, since it is only that they would no longer apply that limit.

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[2] Like all Messages, a GBCS Command is simply a binary number. Strictly what is returned is an encoded version of that number, which is safe to send in Extensible Markup Language (XML) documents.
[3] Non-Critical Service Request for Command to be returned to the User for local delivery to a Device
[4] Non-Critical Service Requests for Command to be sent to a Device via the SM WAN as well as a copy to be returned to the User for local delivery
[5] Critical Signed Pre-Command indicating Command to be returned to the User for local delivery to a Device
[6] Critical Service Request for Command to be sent to a Device via the SM WAN as well as a copy to be returned to the User for local delivery.

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A PPMID, which is capable of also functioning as an HHT initially, could then be pre-loaded with the required instructions in a supplier facility and then delivered to the Consumer premises. The Consumer powering such a Device on would then allow the Device to join initially as an HHT, and then as a PPMID. This would require that such a Device has the use of two Institute of Electrical and Electronics Engineers (IEEE) addresses and associated ZigBee credentials.

Wider requirements for CH changes are that they are applied to both new CH and, by way of firmware upgrade to all installed CHs. Thus, given this change would be bundled with wider CH changes, it would be applied to all existing and future CHs.

There would be no obligation on any Supplier to either use this mechanism or to procure PPMIDs capable of doing so. Security consideration will be needed for this change. The reasoning behind the 60 minute limit was to limit the period over which malformed messages could be submitted via inter-PAN. However, CH have already implemented mechanisms to only accept GBCS compliant instructions. Any assessment of changed risk would be in that light.

3.2   Propsoed draft legal text

GBCS section/clause 10.5, specifically the 4 informative references and 2 normative references to the 60 minute limits would be removed.

Although not part of the SEC, the CPA Security Characteristics for a Communications Hub would need amendment (specifically DEV.1.1.M949[7] and VER.1.1.M949[8]) to remove the check for the 60 minute limit being enforced. The mechanism by which this change to the CPA Security Characteristics would be progressed via BEIS or the SSC as appropriate.[9]

3.3   Propsoed implementation approach

The Proposer would like SECMP0037 to be implemented in the next available release where changes that require a CH firmware upgrade are included.

3.4   Views against SEC Objectives

The table below highlights the Proposer's view on how this modification will better facilitate the achievement of the SEC objectives.

Proposers views against the SEC Objectives	
General SEC Objective	Proposer views
a) to facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems	The Proposer believes that SECMP0037 is a facilitation modification designed to enable pairing PPMIDs to HAN without

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[7] **'Secure Inter-PAN connection'** - At Foundation Grade the product is required to only enable ZigBee Inter-PAN temporarily on power-up and only allow authorised connections.

[8] **'Secure Inter-PAN connection'** – At Foundation Grade the evaluator will verify that ZigBee Inter-PAN is only enabled temporarily on power-up and only allows authorised connections.

[9] Subject to related timing of the handover of the CPA Security Characteristics from BEIS to SSC.

Proposers views against the SEC Objectives	
General SEC Objective	Proposer views
at Energy Consumers' premises within Great Britain.	on-site support, ultimately cost effective when replacing or pairing devices to the HAN in the future.
c) to facilitate Energy Consumers' management of their use of electricity and gas through the provision to them of appropriate information by means of Smart Metering Systems.	The Proposer believes that this modification supports SECMP0037 by providing suppliers with an affective mechanism of getting PPMIDs onto a customer's HAN.
e) to facilitate such innovation in the design and operation of Energy Networks (as defined in the DCC Licence) as will best contribute to the delivery of a secure and sustainable Supply of Energy.	

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4. Potential Impacts

4.1 Impacts

The following section sets out the assessment of the likely impacts arrising from SECMP0037.

Potential Impacts of SECMP0037	
Smart Energy Code Parties	
Suppliers	There are no direct impacts identified at this stage. However, Suppliers may be impacted where they choose to utilise this functionality.
Networks	There are no direct impacts identified at this stage.
DCC	DCC is expected to be impacted by this modification.
Other	Other SEC Party category is expected to be impacted by this modification due to impacts on devices.
Systems	
DCC Systems	There are no impacts identified at this stage. However, impacts maybe identified during the refinement of this modification.
User Systems	
Smart Metering Systems	Smart Metering Systems and/or Communications Hubs are expected to be impacted by this modification.
Other	There are no impacts identified at this stage.
SEC and Subsidiary Documents	
SEC Sections	No SEC Sections or Schedules are impacted by this modification.
Subsidiary Documents	Great Britain Companion Specification (GBCS) document will be impacted by this modification.
Other Industry Codes and Documents	
There are no impacts on other industry codes and documents anticipated.	
Greenhouse gas emissions	
There are no impacts on greenhouse gas emissions anticipated.	
Impact on Consumers	
No impacts have been identified on Consumers.	

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5. Proposed Progression

5.1 Modification Path

This modification is recommended to follow Path 2 'Authority Determined' modification. SECAS have considered the requirements set out in Section D2.6. We note that changes are not expected to be sufficiently material to require an Authority determination. This is because this modification seeks only to amend GBCS section/clause 10.5.

5.2 Refinement

It is also recommended that SECMP0037 should proceed to the Refinement Process. This is because SECMP0037 is likely to impact DCC due to the modification requiring changes to Communication Hubs, that will require consideration by the Working Group an analysis by the DCC.

5.3 Indicative Progression Plan

The following is a high level indicative progression plan. The detail in this plan is subject to change. Changes to the overall timetable, however, are subject to a Panel review.

Modification Timetable	
Stage	Timescales
Modification Proposal raised	1st June 2017
IMR considered by Panel	2nd June – 9th June 2017
Refinement Process	June 2017 – February 2018
Modification Report to the Panel	March 2018
Change Board vote	April 2018
Authority Decision	May 2018
Implementation	June 2019 (earliest potential implementation date, assuming a potential DCC lead time to implement of 12 months[10])

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[10] Based on timescales indicated in prior DCC PAs and IAs. Implementation date could be sooner subject to the nature and impact of the solution developed.

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5.4   Working Group

The Working Group should be made up of existing Working Group members who have previously considered Modification Proposals that have an impact on DCC Services and activities, supplemented by other interested SEC Parties.

5.5   Working Group terms of Reference

A complete Terms of Reference for this Working Group can be found in Attachment B.

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6. SEC Panel Decisions

The Panel:

- **AGREED** for SECMP0037 to progress to the Refinement Process; and

- **AGREED** for SECMP0037 to progress as a Path 2 – Authority Determined modification and the progression timetable outlined in the IMR; and

- **AGREED** the Working Group Terms of Reference provided in Attachment B.

7. Further Information

More Information is available in:

- **Attachment A**: SECMP0037 - Modification Proposal Form; and

- **Attachment B**: SECMP0037 - Working Group Terms of Reference;

For further information please see the Modification register page of the SEC website or contact SECAS at: secas@gemserv.com

Glossary

Acronym	Term	Plain English Summary
CCS01		A Command "Add Device to CHF Device Log".
	Command	Means a communication to a Device in the format required by the GB Companion Specification and which incorporates all Digital Signatures and/or Message Authentication Codes required by the GB Companion Specification.
CH	Communications Hub	Means by a physical device that includes a Communications Hub Function together with a Gas Proxy Function; save that, when such expression is used in relation to the following provisions, such expression shall be interpreted in accordance with the definition of that expression in the DCC Licence: a) the definitions of "CH Defect" and "Test Communications Hub"; and b) Sections F5 (Communications Hub Forecasts & Orders) and F10 (Test Communications Hubs).
CHF	Communications Hub Function	The functionality in the CH specific to its operation as a bridge between the WAN Interface and HAN Interface.
CSP	Communications Service Provider	The service provider delivering and managing the SMWAN infrastructure and Communications Hubs to enable remote communication and management of SME across the whole of Great Britain.
CAD	Consumer Access Device	A Device which, in terms of the GBCS, supports the same Message as an IHD.
	Data	Means any information, data, knowledge, figures, methodologies, minutes, reports, forecasts, images, or sounds (together with any database made up of any of these) embodied in any medium (whether tangible or electronic).
DCC	Data and Communications Company	
	Device	Means one of the following individual devices: (a) an Electricity Smart Meter; (b) a Gas Smart Meter; (c) a Communications Hub Function; (d) a Gas Proxy Function; (e) a Pre-Payment Meter Interface Device; (f) a HAN Connected Auxiliary Load Control Switch; and (g) any Type 2 Device.
DUIS	DCC User Interface Specification	Means the SEC Subsidiary Document identified as the DCC User Gateway Interface Specification' set out in Appendix.
ESME	Electricity Smart Metering Equipment	
	Fast-Track Modifications	Means Modification Proposals (Path 4 Modifications) to correct typographical or other minor errors or inconsistencies to the Code (Section D2.8, SEC Stage 3.0).
GPF	Gas Proxy Function	The functionality in the CH specific to its operation as a store of GSME data and associated data.
GSME	Gas Smart Metering Equipment	
GBCS	GB Companion Specification	The document forming part of the Smart Energy Code describing the nature of Communications Links that the CH must be capable of forming via the HAN Interface and the WAN Interface.
	General SEC Objectives	Has the meaning given to that expression in Section C1 (SEC Objectives) (Section C1, SEC Stage 3.0).

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		The SEC Objectives are those objectives that the SEC has been designed to achieve.
	Greenhouse Gas Emission	Means emissions of Greenhouse Gases, as defined in section 92 of the Climate Change Act 2008 (Section A1, SEC Stage 3.0).
HHT	Hand Held Terminal	The HHT is ancillary equipment that may be used by energy Supplier staff (field engineers) to support installation and maintenance of SME.
HAN	Home Area Network	Means, for each Smart Metering System, the home area network created by the Communications Hub Function forming part of that Smart Metering System.
IHD	In House Display	Means a device provided (or to be provided) at a premises, which: (a) consists of the components or other apparatus identified in; and (b) as a minimum, has the functional capability specified by and complies with the other requirements of, a Version of the IHD Technical Specification which was within its Installation Validity Period on the date on which the device was provided, and which a User acting in the role of Import Supplier or Gas Supplier has joined, or is seeking to join, to an Electricity Smart Meter or Gas Proxy Function (as applicable).
	Inter-PAN	A lower-layer communication link between Devices. This link is used to establish a link key between the HHT and the Communications Hub.
	Non-Critical Service Request	Means a Service Request which is not identified as critical in the DCC User Interface Services Schedule (or, in the case of Elective Communication Services, the relevant Bilateral Agreement).
	Path Type	Means the Modification Path to be followed in respect of a Modification Proposal. The type of Path will depend upon the nature of the variation proposed in the Modification Proposal (D2.1, SEC Stage 3.0). The four Modification Paths under the SEC are: • ***Path 1 Modifications: Authority-led*** (Section D2.4/D2.5, SEC Stage 3.0) • ***Path 2 Modifications: Authority Determination*** (Section D2.6, SEC Stage 3.0) • ***Path 3 Modifications: Self-Governance*** (Section D2.7, SEC Stage 3.0) • ***Path 4 Modifications: Fast-Track Modifications*** (Section D2.8, SEC Stage 3.0)
	Party Category	Means one of the following categories: (a) the Large Supplier Parties collectively; (b) the Small Supplier Parties collectively; (c) the Electricity Network Parties collectively; (d) the Gas Network Parties collectively; or (e) the Other Sec Parties collectively. (Section A1, SEC Stage 3.0).
PPMID	Prepayment Meter Interface Device	Means a device installed (or to be installed) at a premises, which: a) consists of the components or other apparatus identified in; and b) as a minimum, has the functional capability specified by and complies with the other requirements of, a Version of the PPMID Technical Specification which was within its Installation Validity Period on the date on which the device was installed.

SR	Service Request	Means a request sent by a User to the DCC for one of the services listed in the DUIS document. The DUIS requires Service Requests to be submitted in Extensible Markup Language (XML).
	Signed Pre-Command	Means a communication containing the Digitally Signed GBCS Payload of a Pre-Command that has been Digitally Signed by a User or the CoS Party.
SM WAN	Smart Meter Wide Area Network	A network infrastructure provided to enable the sending and retrieval of information between the DCC and SME installed and commissioned for operation through the DCC.
SMETS	Smart Metering Equipment Technical Specifications	The document designated by the Secretary of State to describe the minimum capabilities of equipment installed to satisfy the roll-out licence conditions.
	Technical Specifications	Group of documents including GBCS. CHTS and SMETS.
UTRN	Unique Transaction Reference Number	Means a cryptographic code used to convey credit through human transfer to a GSMS or ESMS operating in Prepayment Mode.
	Urgent Proposal	Means a Modification Proposal deemed an Urgent Proposal where the Authority directs the Panel to treat the Modification Proposal as an urgent Proposal (whether following a referral by the Panel pursuant to Section D4.5, or at the Authority's own initiation) (Section D4.5/D4.6, SEC Stage 3.0).
	User Systems	Means, in respect of each User (DCC User), the Systems of that User (including, where relevant, those of its Supplier Nominated Agent) used in relation to the Services and/or Smart Metering Systems (Section A1, SEC Stage 3.0). The Proposer may wish to consider Suppliers; Network Operators; Registration Data Providers; Other DCC Users (e.g. Authorised Third Parties / Switching Sites); Supplier Nominated Agents.
	ZigBee	Means the wireless language that everyday devices use to connect to one another.