SEC
Smart Energy Code

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Smart Energy Code

DP170

‘Firmware updates to Point to Point Alt HAN Devices’

Modification Report

Version 0.2

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About this document

This document is a draft Modification Report. It currently sets out the background, issue, and progression timetable for this modification, along with any relevant discussions, views and conclusions. This document will be updated as this modification progresses.

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1. Summary

This proposal has been raised by David Jones from AltHANCo.

The Alternative Home Area Network (Alt HAN) solution is being developed to address situations where one, or both, of the gas meter or In Home Display (IHD) are out of range of the Communications Hub, using Point to Point (P2P) Alt HAN Devices.

Over-The-Air (OTA) firmware updates are used to deploy updates that either fix faults or provide new functionality to certain Devices. The Smart Energy Code (SEC) and its subsidiary documents facilitate OTA firmware updates to meters and the Gas Proxy Function (GPF) which is part of the Communications Hub. It also supports OTA updates for other Device types such as Prepayment Meter Interface Devices (PPMIDs) and HAN Connected Auxiliary Load Control Switches (HCALCS) but has no provision for P2P Alt HAN Devices.

This means that any new functionality that is developed to deploy security updates or improve the service to consumers can only be deployed by physical onsite exchanges. The result is higher costs, longer timescales, and more inconvenience to the consumer than if an OTA firmware update could have fixed the issue.

2. Issue

What are the current arrangements?

What is Alt HAN?

In most cases, a standard smart metering installation will include Gas Smart Metering Equipment (GSME), Electricity Smart Metering Equipment (ESME), an IHD and a Communications Hub. All Devices must be within the expected proximity to the Communications Hub for the Home Area Network (HAN) to be able to connect them. Achieving a HAN in some premises such as blocks of flats (Multi Dwelling Units (MDUs)) has additional challenges and the Alt HAN solution is being developed to address these concerns. The Alt HAN solution is required when the GSME or the IHD are out of range of the Communications Hub and the ESME.

P2P Alt HAN Devices

P2P Alt HAN Devices are being developed that will offer a solution in situations where one, or both, of the gas meter or IHD are out of range and act as a Range Extender. AltHANCo uses four different P2P device types (B1, B2, B3, B4) known as ‘bridges’ and these are configured in different ways depending on the set up of the premises. There will be either two or three Devices at each premise to provide a solution. This will depend on whether it is the IHD or the GSME that is out of range, whether they are close together, and whether the GSME has a nearby electricity source.

Each bridge joins the ZigBee network as Range Extenders to tunnel traffic. This is achieved via the standard Appendix AD ‘DCC User Interface Specification’ (DUIS) whitelist functionality and performed by Service Users.

Over-The-Air (OTA) firmware updates

OTA firmware updates to meters and the GPF which is part of the Communications Hub are currently carried out via the DCC's infrastructure. They are used to deploy updates that either fix faults with Devices or provide new functionality to a Device. Without the use of OTA firmware updates, the only way to remedy these would be by a site visit and exchange of the equipment.

There are already defined processes in the SEC and its subsidiary documents to facilitate OTA firmware updates to Communications Hubs, ESMEs and GSMEs. Following the implementation of SECMP0007 'Firmware updates to IHDs and PPMIDs' this will also be possible for PPMIDs and HCALCSs. However, there is no capability to carry out OTA firmware updates for P2P Alt HAN Devices.

SECMP0007 implementation

SECMP0007 is awaiting implementation and the functionality will be delivered in three parts. The initial SEC documentation changes and Data Services Provider (DSP) elements will be implemented on 4 November 2021 (November 2021 SEC Release). The Communication Services Provider (CSP) system changes will then be delivered in the June 2022 SEC Release. Finally, the subsequent Communications Hub firmware updates will be rolled out as soon as they are available. It is expected that this will be during Q4 2022.

What is the issue?

The SEC does not currently support firmware updates to P2P Alt HAN Devices.

Without the ability to perform a remote firmware upgrade, new innovations and functionality to improve the service to consumers will not be cost effective. Additionally, if a security defect is identified then an OTA firmware update to fix the defect would be quicker than a site visit and thus reduces the length of time that a consumer's premise is a security risk.

What is the impact this is having?

Mitigating against risk

OTA firmware updates enable the User to remedy faults on a Device without the need for a site visit. There is a risk that a P2P Alt HAN Device may lose its ability to communicate if there is a ZigBee stack upgrade that needs to be applied to fix a security related issue. This would lead to a mass recall of P2P Alt HAN Devices if there was not a remote firmware update capability.

The costs associated with either of these events would vary depending on the stage of the rollout that it occurred, but high-level estimations are provided below. These figures were produced by AltHANCo based on initial projections and will evolve as this modification is refined.

Estimated costs of recall events without OTA firmware update capability			
Risk	**Detail**	**High-Level Estimate**	**Likelihood**
Mass Recall Event	Low Impact (early stage in rollout: Jun 22)	£25m	Low
	High Impact (end of rollout: Mar 25)	£112m	Very Low
Partial Recall Event	Low Impact (10% of Solutions)	£6m	Low – Medium

Estimated costs of recall events without OTA firmware update capability			
Risk	**Detail**	**High-Level Estimate**	**Likelihood**
	High Impact (25% of Solutions)	£22m	Low

This highlights a significant impact should there be an issue that requires either a partial or a mass recall. If the capability for an OTA firmware update was available, then it is envisaged that these issues could be addressed remotely and in a much shorter timeframe than Device replacement.

Delivering future change

Smart Metering requirements continue to change as the Smart Metering Implementation Programme (SMIP) evolves. OTA firmware updates are needed to support and deliver innovative advancements within the Alt HAN and DCC ecosystems. If OTA firmware updates are not possible this would limit the opportunity for future innovation for P2P Alt HAN Devices as well as other Devices that would rely on them. Additionally, developments in security features would not be able to be rolled out without a Device being physically exchanged via site visit.

Impact on consumers

If OTA firmware updates are not possible then any changes needed will rely on site visits to consumer premises. This is an inconvenience to consumers to accommodate an onsite visit, and additional cost to industry Parties. Consumers may be unable to receive an improved service that could be developed where the benefits may outweigh the costs of an OTA firmware update but not a mass rollout.

In addition, essential security or functionality updates to ensure P2P Alt HAN Devices are 'fixed' will not be able to take place remotely but will require site visits.

3. Assessment of the proposal

Observations on the issue

The Change Sub-Committee (CSC) noted that SECMP0007 was not yet implemented, and parts of the solution were not scheduled to be implemented for another two years. This was noted by the Proposer who advised that the rollout of Devices would begin in April 2022. Rollout would need guidance from Parties to ensure Devices could be capable of receiving updates in time for implementation. They have already been in contact with the Department for Business, Energy & Industrial Strategy (BEIS) and the DCC with regards the solution.

One CSC member noted that OTA updates to the Alt HAN Devices would be a necessity going forwards.

A request for information (RFI) has been issued to industry to gain further information from industry to help scope the business requirements. A verbal update on these responses will be given at the CSC meeting, 27 July 2021.

Appendix 1: Progression timetable

AltHANCo has already engaged with DCC and its Service Providers, the Department for Business, Energy & Industrial Strategy (BEIS) and a variety of industry stakeholders in advance of raising this SEC Modification. Following this initial engagement, the draft business requirements have been developed with those parties. SECAS has also issued an RFI to consult on specific elements of the requirements.

Following the review of the RFI responses, SECAS will present the Proposal to the CSC for final comment and decision, with the recommendation that it proceeds to the Refinement Process. SECAS will continue to work with the Proposer to develop the Proposed Solution and subsequent business requirements before presenting to the relevant Sub-Committees and the Working Group.

Timetable	
Event/Action	**Date**
Draft Proposal raised	16 Jun 2021
Presented to CSC for initial comment	29 Jun 2021
Request for information	6 Jul 2021 - 23 Jul 2021
Presented to CSC for final comment and conversion to a Modification Proposal	27 Jul 2021
Business Requirements discussed with Security Sub-Committee (SSC)	28 Jul 2021
Business Requirements discussed with Working Group	4 Aug 2021
Business Requirements discussed with the Technical Architecture and Business Architecture Sub-Committee (TABASC)	5 Aug 2021
DCC Preliminary Assessment requested	Early Aug 2021
Update provided to CSC	31 Aug 2021

Appendix 2: Glossary

This table lists all the acronyms used in this document and the full term they are an abbreviation for.

Glossary	
Acronym	**Full term**
Alt HAN	Alternative Home Area Network
BEIS	Department for Business, Energy & Industrial Strategy
CH	Communications Hub

Glossary	
Acronym	**Full term**
CSC	Change Sub-Committee
DCC	Data Communications Company
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
HCALCS	HAN Connected Auxiliary Load Control Switches
IHD	IN Home Display
MDU	Multi Dwelling Unit
OTA	Over The Air
P2P	Point To Point
PPMID	Prepayment Meter Interface Device
SEC	Smart Energy Code
SMIP	Smart Metering Implementation Programme
SSC	Security Sub-Committee