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MP119 'CH Alert Storm Consolidation'

Modification Report Version 0.4



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 modification has been raised by Graeme Liggett from the Data Communications Company (DCC).

This modification identifies the need to address Device Alert Storms at the Home Area Network (HAN) and Communications Hub (CH) level. With the increasing number of Devices connected to the DCC System, and with these Devices creating more Alerts than originally envisaged, Device Alert Storms are on the rise. As a result, protection is needed by the Communication Service Providers (CSPs) to ensure an efficient service continues to be delivered.

MP119 is currently in the Refinement Process where the solution is being developed.

2. Issue

What are the current arrangements?

The number of Devices connected to the DCC System is increasing on a daily basis. The DCC has found that Devices can generate the same Alert at a higher rate than initially intended. This is referred to as a Device Alert Storm.

To mitigate against Device Alert Storms an Alert Storm Protection mechanism was proposed for implementation within the Data Service Provider (DSP) solution that would detect these Device Alert Storms. The identified alerts would be subject to consolidation resulting in a substantial reduction in the number of alerts being processed and delivered to Service Users. This is being progressed under [SECMP0062 'Northbound Application Traffic – Alert Storm Protection'](#).

What is the issue?

As the number of Devices connected to the DCC System has increased, it has become apparent that Devices can enter a state whereby they repeatedly generate the same Alert at a higher rate than intended.

Device Alert Storms are already generating large numbers of Alerts which are impacting network, DSP and Service User capacity, and with the Smart Meter Roll-out, the number of Alert Storms is set to increase.

The CSP North (Arqiva) have proposed changes to HAN Devices and CHs to provide full protection. These proposals have been presented at industry forums. The proposed changes would “localise” the impact of Alerts to the HAN and CHs. Changes to the behaviour of HAN Devices are anticipated to require additional investigation and would take an extended period to be implemented. Changes to CHs is thought to be a quicker path, providing protection whilst Device manufacturers implement a mechanism and would continue to provide protection against Alert Storms.

This proposal would look to make changes to the CHs to solve the problem for the DSP, Smart Metering Technical Specification (SMETS) 2 Communication Service Providers (CSPs), and SMETS2 CHs.

What is the impact this is having?

Supporting information regarding Device Alert Storm Volumes

- In December 2019 Device Alerts accounted for approximately 90% of service traffic. Device Alerts totalled 43 million per day and Service Requests reached four million.
- 8F3E Alerts accounted for 80% of the total service traffic in December 2019.
- On 31 December 2019, 43 million Device Alerts were carried from approximately four million meters. ISFT¹ contracted volumes are for 60 million Devices Alerts a month across 52 million meters.
- Month-on-Month Device Alerts:

Device Alert Storm Volumes		
	November 2019	December 2019
Device Alerts	Approx. 1 billion	1.3 billion (30% increase)

This implies a doubling of service traffic every three months, if the current rate of increase continues.

- Once at scale, approximately 10 billion Device Alerts will need to be supported if the current rate of generation continues on a per meter basis. This compares to the expected three billion Service Requests at scale.

*This information was presented by the DCC to the Operations Group (OPSG) during a meeting ([OPSG 29 0402 08](#)) relating to Alert volumes and potential and is based on analysis of the latest data from December 2019.

3. Assessment of the proposal

Observations on the issue

The proposal has been presented to the Smart Energy Code (SEC) Sub-Committees who are happy to see the proposal progress into the Refinement Process. No further comments were received at this stage.

The proposal was taken to the Change Sub-Committee (CSC) for recommendation that it is converted into a Modification Proposal and enter the Refinement Process. The proposal was discussed at length as Alerts are deemed as a high-priority issue by the industry. A CSC member stated that there needs to be a considered approach towards Alerts as there are several modifications raised to address specific issues, and the DCC needs to ensure all parts of the ecosystem are in alignment.

The DCC noted the intent of this modification is to resolve the CH issue, and it wanted to resolve this as quickly as possible. The mechanism for any solution is intended to be configurable using the solution and the parameters agreed under SECMP0062. However, it acknowledged the need for the issue to be looked at holistically. It was agreed that there should be an overall view of the issues

¹ As part of ISFT (Invitation to Submit Final Tender), the Department of Energy and Climate Change (DECC) provided message volume profiles to allow respondents to size their systems.

surrounding Alerts and the DCC suggested that this could be included in the scope of the modification during the Refinement Process.

Support for Change

May 2020 SEC Working Group

The Working Group raised concerns over the costly solution for SECMP0062 and how it fitted with MP119, they questioned if SECMP0062 solution would become irrelevant. The DCC stated that the solution of SECMP0062 would be used less frequently once MP119 is implemented as Alert Storms will be filtered by the time they reach the DSP. However, the DCC believe this modification will offer a multi-layered level of protection.

A Working Group member queried the approach of raising several modifications to address issues around Alert Storms. They felt that this approach could over complicate the matter and advised that Alert Storms should be addressed from one point instead of several. The DCC responded that this modification will resolve the issue from the root cause which has been identified as the Home Area Network (HAN) and CH level.

Questions were asked around the 8F12 Alert. This Alert is not included in SECMP0062's exclusion list as the DCC stated that this can be a genuine Alert. It was therefore agreed that MP119 will feature a business requirement which lists Alerts which will be excluded from Alert Storm consolidation. This list will largely mirror that of SECMP0062. A Working Group member also believed that there should be a business requirement to keep the reports for MP119 and SECMP0062 separate. This was agreed by the DCC.

Clarity was provided by the DCC that the proposed solution will result in the CH sending one Alert, and if the CH itself starts generating multiple duplicated Alerts, it will filter them accordingly.

July 2020 SEC Working Group

The Working Group advised that SECMP0062 was approved on the basis that it would resolve the issue of Alert Storms as a whole. This raised concern amongst the Working Group due to the high cost of implementation for SECMP0062 and now it appears that the solution will be used less because of MP119 consolidating Alerts at a CH and HAN level.

The DCC presented further information on the modification, stating that upwards of 60 million Alerts per day are currently handled. They believe that addressing this at the root cause is the best way forwards (at a CH and HAN level). The DCC propose that a mechanism should be implemented within the CH to constrain the Alert Storm. This will prevent the transmission of duplicate Alerts reaching the CSP. They stated that it will be important to identify where Alert Storms are being managed so that investigations and correction can take place. As a result, it is believed that this modification would better facilitate SEC Objective (a).

A Working Group member requested that the Preliminary Assessment should display hard evidence that there is a problem that needs resolving. This is to include actual figures that will validate the business case of the modification. This is in anticipation of high CSP costs. A Working Group member stated that the CSP for South and Central regions is currently throttling Alerts which mitigates the risk of Alert Storms. This is not currently SEC compliant, though this should be explored as it could be a significantly cheaper solution. Another Working Group member queried if statistics should be made public in relation to how many Alerts would be transmitted if the throttling did not occur.

The Working Group largely agreed with the modification's business requirements. One Working Group member however, highlighted that it would be best if the reports for SECMP0062 and MP119 should be combined but with an indicator as to where the Alert Storm has been consolidated. This was agreed by the Working Group and so SECAS will amend the requirement accordingly.

Appendix 1: Progression timetable

The business requirements have been discussed at the July 2020 SEC Working Group. The business requirements have undergone further refinement and SECAS will now request the DCC Preliminary Assessment. SECAS will update Panel on progress in September 2020.

Timetable	
Action	Date
Draft Proposal raised	10 Mar 2020
Presented to CSC for comment and recommendations	31 Mar 2020
Panel converts Draft Proposal to Modification Proposal	17 Apr 2020
Business requirements developed with DCC	20 Apr – 29 Apr 2020
Modification discussed with Working Group	6 May 2020
Business requirements developed further with DCC	7 May – 24 Jun 2020
Business requirements discussed with Working Group	1 Jul 2020
Requested Preliminary Assessment	13 Jul 2020
Update Panel	11 Sep 2020

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
CH	Communications Hub
CSP	Communication Service Provider
DCC	Data Communications Company
DECC	Department of Energy and Climate Change
DSP	Data Service Provider
GBCS	Great Britain Companion Specification
HAN	Home Area Network
ISFT	Invitation to Submit Final Tender
OPSG	Operations Group
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SMETS	Smart Metering Equipment Technical Specification