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SECMP0062 Initial Modification Report

About this document

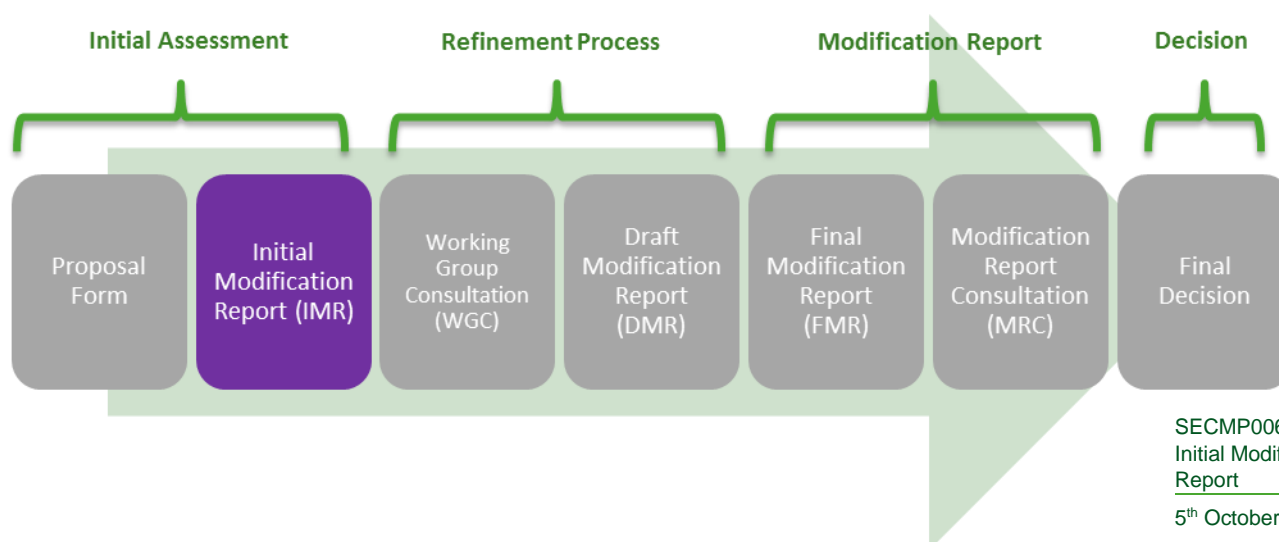
This Initial Modification Report (IMR) contains our initial assessment of [SECMP0062 'Northbound Application Traffic Management – Alert Storm Protection'](#). It also provides information on the issue, the Proposer's solution, potential impacts, costs and proposed progression.

This document is submitted to the Smart Energy Code (SEC) Panel for consideration to determine how this Modification Proposal should be progressed through the Modification Process.

As part of this document the Panel will be invited to:

- **AGREE** that this modification should be submitted into the Refinement Process to be assessed by a Working Group;
- **AGREE** the Working Group Terms of Reference;
- **AGREE** the progression timetable set out in Section 6; and
- **AGREE** that SECMP0062 should be progressed as a Path 3 Modification Proposal.

Where are we in the process?



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Stage 01: Initial Modification Report

SECMP0062:

Northbound Application Traffic Management – Alert Storm Protection

What stage is this document in the process?

01	Initial Assessment
02	Refinement Process
03	Modification Report
04	Decision

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Summary

This modification proposes to enable the implementation of a traffic management solution to protect the DCC system and Service Users against alert storms originating from a single device.

Proposed Progression

This Modification Proposal is recommended to be:

P3

- progressed as a Path 3: Self-Governance Modification Proposal; and
- progressed through the refinement process for eight months.

8
Months

Potential Impacts

!

- All Supplier Parties
- All Network Parties
- Other SEC Parties
- DCC Central Systems

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About this Document

This is an Initial Modification Report (IMR). This document contains details of the issue, solution, potential impacts and costs as well as the proposed progression for SECMP0062.

This document has one attachment:

- Attachment A contains the SECMP0062 Modification Proposal Form

The Panel will consider this IMR at its meeting on 12 October 2018 and determine whether this modification should be progressed through the Modification Process.

1. Summary

What is the issue?

Alert Storms occur when devices repeatedly send alerts to DCC Systems and Service Users. Although these devices have gone through rigorous test assurance processes, it is an inevitability that not every possible combination and scenario will have been accounted for. This means that many devices pose a risk of entering a state whereby it repeatedly and rapidly generates the same device alert, adding unnecessary traffic to the Communication Service Provider (CSP)/Smart Metering Equipment Technical Specification (SMETS) 1 Service Provider Gateway between the DCC Systems and Service Users. Currently there is little protection against Alert Storms, meaning that multiple alerts are being counted and entering the gateway, rather than being filtered out, even after recognising they are originating from the same single device.

What is the Proposed Solution?

The proposed solution is to provide Alert Storm protection through a DCC deigned mechanism which will count the number of alerts originating from a specific device within a defined time window. If the device sends alerts above a pre-determined threshold value, the mechanism will discard excess alerts from the device and only forward one alert in a designated period agreed by the DCC on to the intended Users. Discarded alerts will be counted for Anomaly Detection purposes and Service Users will be notified ahead of time for the exact actions being taken.

Potential impacts

Party

Large Supplier Parties	X	Small Supplier Parties	X
Electricity Network Parties	X	Gas Network Parties	X
Other SEC Parties	X		

System

DCC Systems	X	Party interfacing systems	
Smart Metering Systems		Communication Hubs	
Other systems			

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Potential implementation costs

We believe that the cost to implement SECMP0062 will be made up of SEC and DCC time and effort. The full impacts and total estimated cost to deliver this modification will be determined as part of the Working Group's assessment.

Proposed progression

We recommend that this modification is progressed to the Refinement Process for an eight-month assessment by a Working Group.



2. What is the issue?

Context to DCC Systems Communications

The DCC and Service Users communicate through the use of DCC Systems for sending service requests and alerts for different registered devices. Due to the DCC system having a finite capacity for how many requests and alerts it can handle, if this system becomes overloaded, it will affect the stability and performance of the system. This system is also prone to Alert Storms, a state where individual devices will encounter a scenario where they frequently generate the same alert and send it through the DCC Systems. This adds needless traffic to the DCC Systems and, as a result, slows down the response time for other alerts and service requests that have to use the same system as a means of communication. Alert Storms therefore need to be avoided as much as possible, or alternatively, traffic management needs to be in place to prevent as many repeated alerts from a faulty device entering the system.

What is the issue?

Alert Storms are one of the biggest issues faced by the DCC with their systems for handling service requests and alerts from Service Users. Currently, the DCC uses a detection solution for northbound traffic (passing from Devices to Users) which follows a pattern where alerts are counted over a specified time window. If the total number of alerts exceeds a pre-determined threshold (which is defined by either amber or red levels) the event is recorded in the security log and an incident file is saved. However, this solution does not prevent the alerts from being forwarded to the relevant Service Users, so therefore does not protect the DCC Systems against overload or traffic generated by Alert Storms. The DCC thereby needs to take direct action to protect their systems to ensure availability of the service for their Service Users and incorporate a new means of traffic management to prevent, where possible, excess alerts from entering their system.

3. Solution

Proposed solution

SECMP0062 was raised by DCC. The proposed solution is to provide Alert Storm protection through a DCC designed mechanism which will count the number of alerts originating from a specific device within a designated timeframe. If the device sends alerts above a pre-determined threshold value, the mechanism will discard excess alerts from the device and only forward one per designated period (N) on to the intended Users. Discarded alerts will be counted for Anomaly Detection purposes and Service Users will be notified ahead of time for the exact actions being taken.

The mechanism operates by periodically checking alerts to see if there is a “red” threshold anomaly incident against the device, by looking it up in the Incident store. If a “red” threshold anomaly is detected at the device level, the mechanism starts or continues a counter for each specified Alert Code. If the counter exceeds its limit for the Alert Code in question in the designated timeframe, the code will be marked as “overloaded” – meaning that if the “red” threshold of a device is exceeded, from that point onwards it will have its alerts halted and cleared.

The mechanism then sorts the Alert Codes. If an Alert Code isn’t “overloaded” it is passed on to Request Management. If an Alert Code is “overloaded” it will allow only 1/N alerts to be let through (see above), with the count of the remaining alerts sent to Request Management. After the alerts are counted to see if a device-level threshold has been exceeded, this creates a “red” threshold anomaly incident (sent to the Incident store) and indicates that the device needs to be monitored on a per Alert Code basis.

Views against the General SEC Objectives

The Proposer believes that this Modification Proposal better facilitates General SEC Objectives (a) and (e).

- **Objective (a)**¹: The Proposer believes that the modification better facilitates efficiency and operation of Smart Metering systems by reducing the number of repeated alerts that will enter the DCC Systems.
- **Objective (e)**²: The Proposer believes that the modification will better deliver innovation in the design and operation of Energy Networks by ensuring traffic management operates as smoothly as possible when communicating through the DCC Systems.

¹ (a) The first General SEC Objective is to facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers’ premises within Great Britain

² (e) The fifth General SEC Objective is 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



For the avoidance of doubt, the Proposer believes that this modification is neutral against all other General SEC Objectives.

4. Potential Impacts

The following section sets out the initial assessment of likely impacts and costs should SECMP0062 be approved and implemented. Additional impacts may be identified by the Working Group as part of the Refinement Process.

SEC Party impacts

Large Supplier Parties	X	Small Supplier Parties	X
Electricity Network Parties	X	Gas Network Parties	X
Other SEC Parties	X		

Supplier Parties, Network Parties and Other SEC Parties will need to consider how the DCC systems employing this mechanism will affect their own systems and processes once a device alert threshold has been exceeded.

Central System impacts

DCC Systems	X	Party interfacing systems	
Smart Metering Systems		Communication Hubs	
Other systems			

The DCC Systems will be impacted due to adding the mechanism which delivers the solution set out in this modification proposal.

Testing

Testing will be required to ensure that there are no unintended consequences from introducing this solution.

SEC and Subsidiary Document impacts

SEC Appendix E 'DCC User Interface Services Schedule' will be impacted by this modification.

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Impacts on other industry codes

No other Energy Codes are expected to be impacted.

Greenhouse Gas Emission impacts

Greenhouse Gas Emissions will not be impacted.



5. Potential Costs

Potential implementation costs

The cost to implement SECMP0062 is expected to include the following:

- SEC Administration time and effort for:
 - making the necessary amendments to the SEC;
 - releasing a new version of the SEC to SEC Parties; and
 - publishing this on the SEC website.
- DCC time and effort for:
 - developing the necessary changes to systems – the full impacts are to be confirmed during the Refinement Process;
 - pre-integration, system integration and user testing; and
 - implementation to live.

The full costs and effort will be determined as part of the Working Group's assessment and development of the modification.

6. Proposed Progression

Modification Path

We recommend that SECMP0062 be progressed as a Path 3: Self Governance Modification Proposal. The rationale for this decision is that the modification whilst implementing changes to the DCC systems will not affect any obligations of the DCC nor constitute any material impacts to other SEC parties.

Proposed progression

We recommend the following progression timetable for Panel consideration.

Activity	Date
Modification Proposal raised	27 Sep 18
IMR presented to Panel	12 Oct 18
Working Group meeting	W/B 29 Oct 18
Working Group meeting	W/B 12 Nov 18
Working Group meeting	W/B 26 Nov 18
Preliminary Assessment	10 Dec 18 – 07 Jan 19
Working Group meeting	W/B 21 Jan 19
Working Group Consultation	28 Jan 19 – 18 Feb 19
Impact Assessment	04 Mar 19 – 07 May 19
Panel reviews Modification Report	14 Jun 19
Modification Report Consultation	17 Jun 19 – 8 Jul 19
Change Board vote	24 Jul 19

Refinement length

We recommend that this modification is submitted for an eight-month Refinement period and assessment by a Working Group. This eight-month timeframe will allow for:

- a full Working Group assessment to take place (allowing for around four Working Group meetings);

- one 15 Working Day industry consultation to be issued and reviewed; and
- a full DCC Assessment to be undertaken (approx. 15 Working Days for the Preliminary Assessment (PAs) and 40 Working Days for the Impact Assessment (IAs));

For a more detailed progression plan please see Appendix 1.

Working Group

Membership

We recommend that the SECMP0062 Working Group be made up of individuals with expertise and relevant experiences with DCC Systems, being a System User and as well as any other interested parties.

Terms of Reference

In order to assess the Modification Proposal fully, we are recommending that the Working Group considers the following specific questions in addition to the standard Working Group areas of assessment.

Q1: Will the mechanism in the proposed solution have unintended consequences in its filtration process?

This modification looks to address the issue of Alert Storms that are picked up by the DCC Systems. As part of this modification, the Working Group should consider if there will be any issues with the proposed mechanism used to evaluate whether or not a device enters a state of repeatedly sending out alerts in a specified time period. This is due to needing to evaluate the risk of the mechanism not registering alerts from devices which have not entered this state.

Q2: Would the traffic management solution be better placed as firmware for devices, rather than specifically to the DSP?

It should be considered whether, rather than making the modification solution-specific to the DCC's Data Service Provider (DSP), a better long-term solution would be to provide the traffic management to devices as part of a firmware update. This method would potentially allow the same removal of alerts providing excess traffic in other communications relays like the CSPs as well as the DSP. As part of the modification, the Working Group should consider if this alternative solution is desirable and if so, what drawbacks and technical issues would be encountered.

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Q3: Should future management of the mechanism proposed in the modification's solution be amended by the Operations Group?

Rather than use future modifications to amend the mechanism which is proposed as the solution in this modification proposal, the Working Group should consider whether any future configuration should be assessed and undertaken by the Operations Group. The reason for this suggestion is that the Operations Group would be able to make amendments and configure elements of the mechanism such as the (N) defined time period with greater speed than would be possible under a SEC Modification. As part of this modification, the Working Group should consider how the solution will need amending over time if implemented given the circumstances that may occur, such as a need to increase or decrease the defined time period depending on the average alert frequency from devices during Alert Storms.



7. Recommendations

The Panel is invited to:

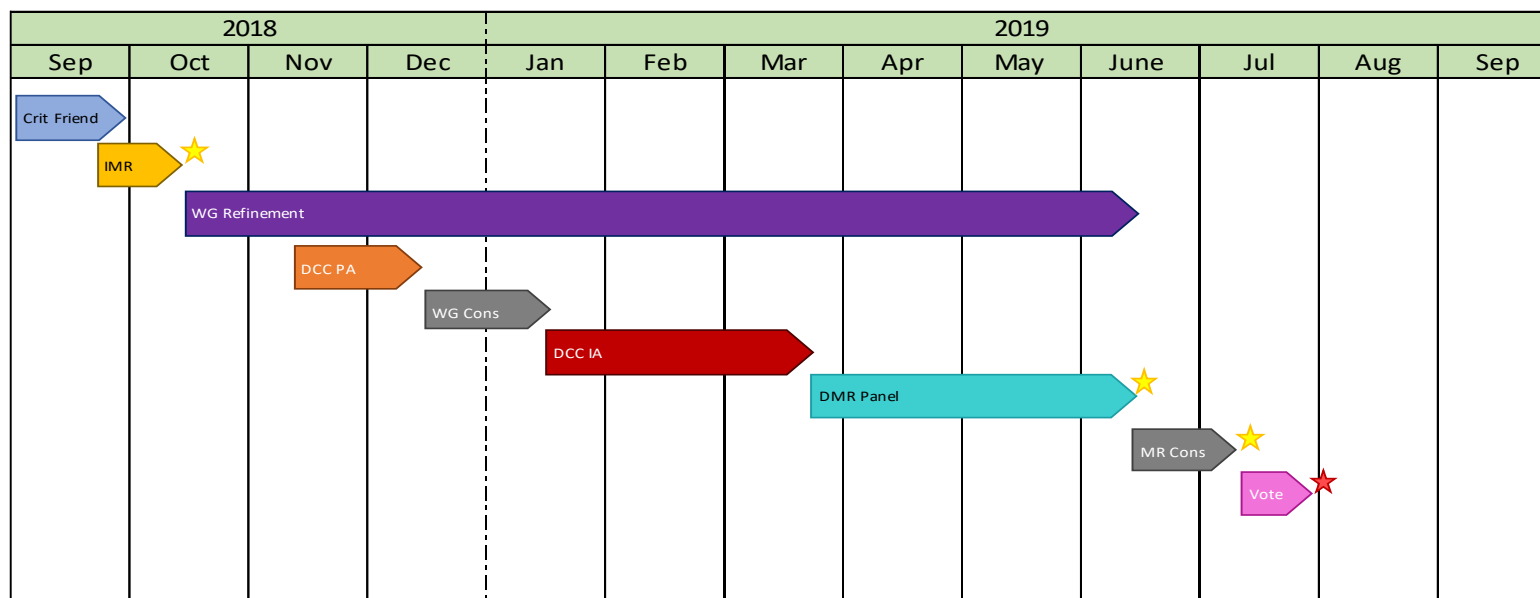
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- **AGREE** the Working Group Terms of Reference;
- **AGREE** the progression timetable set out in Section 6; and
- **AGREE** that SECMP0062 should be progressed as a Path 3 Modification Proposal.



Appendix 1: Detailed Progression Plan

Please note that the progression plan shown below is subject to change.

Panel agreed milestone ★ Decision Date ★



Appendix 2: Glossary

The table below provides definitions of the terms used in this document.

Acronym	Defined Term
CSP	Communication Service Provider
DCC	Data and Communications Company
DSP	Data Service Provider
IA	Impact Assessment
IMR	Initial modification Report
PA	Preliminary Assessment
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SMETS	Smart Metering Equipment Technical Specifications