Data Communications Company

SEC Modification Proposal, MP102B, DCC CR4483

Power Outage Alerts triggered by an OTA firmware upgrade - enduring solution

Full Impact Assessment (FIA)

Version:	**1.0**
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Author:	**DCC**
Classification:	**Public**

Data Communications Company

Contents

1 Executive Summary

The Change Board are asked to approve the following for implementation:

- Total cost to implement MP102B of £197,524, which comprises:
    - £144,252 in Design, Build and PIT costs
    - £53,272 in release costs (SIT and Implementation)
- A timescale to complete the implementation of seven (7) months
- Include MP102B in the June 2023 SEC Release
- Application Support costs of £1,722 per month

Problem Statement

Over the Air (OTA) firmware updates can cause some Electricity Smart Metering Equipment (ESME) to interrupt power to the Comms Hub and thus generate a Power Outage Alert (POA). The Distribution Network Operator (DNO) is unable to tell whether there is a real issue with the power to the premises or whether the POA was generated as a result of a firmware upgrade to the ESME.

The fundamental business requirement for DCC under MP102B is to build a mechanism to suppress any Power Outage Alerts (DCC Alert AD1) which may have been caused by a firmware update to a specific set of Landis+Gyr ESME Devices.

The DCC solution presented in this Full Impact Assessment (FIA) will suppress AD1 Alerts for a specific list of Landis+Gyr ESME Globally Unique Identifiers (GUIDs).

Benefit Summary

By implementing either solution proposed in this Modification, DNOs will be able to more reliably interpret POAs as an indication of a genuine supply outage at a consumer's premises and, conversely, will not receive spurious POAs caused by OTA firmware updates, which may currently lead DNOs to expend resource unnecessarily to:

- either to check the energisation status of each meter from which a POA is received; or
- send a member of staff to site to investigate.

2 Document History

2.1 Revision History

Revision Date	Revision	Summary of Changes
27/05/2022	1.0	Issued to SECAS

2.2 Associated Documents

This document is associated with the following documents:

#	Title and Originator's Reference	Source	Issue Date
1	MP102B Modification Report v0.8	SECAS	22/05/2021
2	MP102B Business Requirements v0.4	SECAS	13/09/2021
3	MP102B CR4483 - PIA - Power Outage Alerts triggered by an OTA firmware upgrade - enduring solution v1.0	DCC	15/11/2021

2.3 Document Information

The Proposer for this Modification is Matthew Alexander of SSEN.

The Preliminary Impact Assessment (PIA) was requested of DCC on 15 October 2021, and accepted on 22 October 2021. It was completed on 15 November 2021. A Full Impact Assessment was requested on 1 April 2022.

3 Solution Requirements and Overview

Problem Statement In this section, the context of the Modification, assumptions, and the requirements are stated.

The requirements have been provided by SECAS, the Proposer, and the Working Group.

3.1 Context

POAs are used by DNOs to improve customer service by becoming aware of power outages sooner rather than relying on their customers to contact them. POAs enable the DNO to restore supply to affected customers more efficiently and more quickly.

OTA firmware updates can cause ESME to generate a POA. The DNO is unable to tell whether there is a real issue with the power to the premises or whether it the POA was generated as a result of a firmware upgrade to the ESME.

Investigations during the Refinement Process found the scale of the issue affecting existing meters much greater than initially envisaged. Due to an anticipated lengthy lead time for implementation where meter Manufacturers could potentially still produce Devices that cause erroneous POAs, it was agreed that there should be two separate solutions to address the issue:

- MP102A: a Technical Specifications document change for meter Manufacturers to abide by for ESME produced after implementation (implemented as part of the November 2020 SEC Release); and

- MP102B: an enduring solution for the set of meters that are currently installed and which cannot be upgraded OTA to eliminate the behaviour.

3.2 Problem Statement

Over the Air (OTA) firmware updates can cause some ESME to interrupt power to the Comms Hub and thus generate a POA. The DNO is unable to tell whether there is a real issue with the power to the premises or whether the POA was generated as a result of a firmware upgrade to the ESME.

3.3 Business Requirements

There are three business requirements for this Modification.

Ref	Requirements
1	An OTA firmware update to a tracked Landis+Gyr ESME currently installed will not result in a Power Outage Alert (AD1 Alert) reaching the Network Operator in the first instance.
2	The Data Services Provider (DSP) will track firmware activations on tracked Landis+GyrLandis+Gyr ESME and then suppress AD1 Alerts from the tracked Landis+Gyr ESME for 30 minutes.
3	If the Service Requests for firmware activations on a tracked L + G ESME contain a firmware activation date and time, the DSP will extract and record the firmware activation date and time. The DSP shall then suppress AD1 Alerts from the tracked Landis+Gyr ESME for 30 minutes starting at the recorded firmware activation time.

The Working Group requested that during the Full Impact Assessment, the DCC assess tracking firmware activations and subsequent AD1 Alerts only for the list of GUIDs that Landis+Gyr have provided for Devices that exhibit the behaviour described in the problem statement. In the PIA, this was known as the “Enhanced Solution”.

In response to the PIA, the Proposer and members of the Working Group also requested that the Power Outage Alert Suppression log, which forms part of the proposed DCC solution, be made available to the relevant SEC Parties (Electricity Distributors).

3.4 Scope

This solution will be applicable only to specific Landis+Gyr SMETS2 ESME, as identified by their GUID.

4 Solution Overview

Changes to the DSP are required for this Modification solution.

4.1 Overview

The solution requires changes to the motorway and reporting components of the DSP application.

DSP has been provided with a list of devices that are to be subject to AD1 alert suppression, which was supplied to DCC along with this Modification. DSP has based its price on this list of GUIDs and any variation to that list in advance of, or during implementation may be subject to a further Change Request.

On receipt of a firmware activation Service Request (SRV11.3 only), the motorway records the device's CHF as activation in progress if the following are true:

- the Target device is a SMETS2 ESME;
- the manufacturer is included in the configurable list of manufacturers subject to AD1 alert suppression (initially configured to be Landis+Gyr);
- the device is included in the list provided to DCC.

On Demand and Future Dated modes of operation are handled. Future Dated processing includes processing of cancellations.

On receipt of an AD1 alert, the motorway checks whether the alert is for a device that is recorded as activation in progress and within the configurable time period allowed. If so then an entry is added to the Power Outage Alert Suppression log, and no further processing is performed, i.e. the alert is not passed to any Service Users, and no Service Audit Trail entry is recorded.

The Power Outage Alert Suppression log is a new log file. Log files are transferred to the DCC via the ESI interface on a timed basis, or whenever the log reaches a certain size.

All behaviour is implemented behind a feature switch.

4.2 Request Management

In southbound processing, Request Management will build a tracking mechanism that records firmware activations in progress for affected devices. Devices will be tracked for 30 minutes (this tracking time is configurable).

In northbound processing, Request Management will check whether an AD1 Alert is for a device currently being tracked and, if so, will stop processing and add an entry to the 'Power Outage Suppression Log'.

Request Manager will be configured to transfer Power Outage Suppression logs to the Report Server.

4.3 Data Management / Data Model

Data Management needs to support tracking of firmware activation requests. There will be changes to the data model to support this.

Data Management will also need to build housekeeping functionality to manage the firmware activation tracking data.

4.4 Reporting

The Report Server will be configured to recognise and process incoming Power Outage Suppression Logs. Standard ESI report headers and footers will be added and transferred to the DCC via the ESI Gateway, for onwards distribution to SEC Parties via the DCC SharePoint.

There will be a small amount of effort undertaken by the DCC to make use of the existing solution for automatic distribution of files to SEC Parties' SharePoint libraries.

4.5 Security Impact

The DSP Security Assurance team has reviewed this change. There is no material impact on the DSP system security implementation. DCC has provided to DSP a list of devices that are to be subject to AD1 alert suppression. The contents of this file will be incorporated into the software build.

The Security Assurance team will provide general security oversight of the implementation throughout, in accordance with DSP's contractual requirements:

- reviewing test artefacts and outcomes where there is a potential security consideration;
- attending meetings where required by the implementation teams; and
- liaising with DCC as necessary on any security related concerns.

No additional Penetration Testing will take place as a result of this change on the basis that:

- there are no material changes to DSP interfaces;
- there are no material changes to the security implementation; and
- there is no new infrastructure being introduced.

As a result of the above, there is no requirement to update the Protective Monitoring implementation.

4.6 Technical Specifications and Documentation

There are no changes to any of the Technical Specifications.

Updates to the SEC will be required to require that DCC suppresses AD1 Alerts in specific circumstances and for specific Devices.

4.7 Infrastructure Components

There is no impact to infrastructure as part of this Modification.

4.8 Application Support

DSP has included a period of enhanced support immediately after go-live of MP102B - Early Life Support (ELS) - which provides enhanced monitoring and checking of system health and aims to investigate and address any anomalous behaviour before service incidents materialise. Further, the ELS provides assistance to DCC in incidents where Service Users are unprepared for the changes introduced within the release and which are therefore most likely to be found post go live.

4.9 Service Impact

The introduction of this new Service User facing functionality has some potential to result in user queries that are passed through to the DSP Applications Management Support team. It is estimated that this may result in up to seven simple complexity additional calls per month.

No changes to SLAs or reporting are expected as a result of this change.

5 Testing Considerations

This Full Impact Assessment includes the cost to develop, fully test and deliver this SEC Modification.

5.1 Pre-Integration Testing

The DSP PIT team will design and implement the functional updates required to the DSP for the change.

System Testing will be carried out to prove that the functionality specified in the Design has been implemented against agreed acceptance criteria. Both manual and automated testing is in scope. The DSP PIT System Test team create manual tests (and data). Test execution covers manual testing and automated regression test packs.

Once PIT Complete status is achieved, the PIT team will support post PIT activities in the form of technical support and defect fixes to allow DSP to achieve its test exit obligations.

The updates to the DSP system and the timing of the PIT exit will be agreed with the DCC through updates, submission and review of the Solution Design documents.

5.2 System Integration Testing (SIT)

MP102B will be implemented into Production via a SEC Release (currently planned for June 2023).

This section covers only activities and deliverables that are specific to MP102B. It does not, therefore, include System Regression testing or SIT Management and Governance activities, including test completion reporting, which will be incorporated in to a SEC Release Change Request. Furthermore, this response includes effort only for MP102B-specific contributions to the SIT artefacts that will be produced under the relevant SEC Release Change Request.

The DSP SIT team will plan, prepare and execute tests that demonstrate the key changes in behaviour for MP102B across the DCC Total System, comprising:

- AD1 alerts are suppressed for a period of 30 minutes following an ESME firmware OTA for an ESME that is included in the GUID list of devices requiring AD1 alert suppression;
- AD1 alerts that are suppressed are logged and reported via the ESI to DCC.

The DSP SIT team will be in control of all tests executed within the SIT environment, planning and co-ordinating test across all other Service Providers. DCC will engage with all Service Providers to secure their support for SIT.

Testing will be executed in SIT-B environment only and will align with existing release practices at the time of submission.

The effort for test reporting produced on completion of the Solution Test will be included in the SEC Release Change Request for the release in which this MP102B is eventually deployed to Production.

5.3 User Integration Testing (UIT)

There is no perceived need to test this separately in the UIT environment.

6 Implementation Timescales and Releases

This Modification is expected to be included in a SEC Release in June 2023. 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 approximately **seven months**.

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

Phase	Duration
SECAS agreement on scope of release	
CAN signature	D + 1 Month
Design, Build and PIT Phase	3 Months
SIT and UI Phase, aligned with Release Dates	3 Months
Transition to Operations and Go Live	D + 7 Months

6.2 SEC Release Allocation and Other Code Impacts

This Modification is expected to be implemented as part of the June 2023 SEC Release, however the allocation to a release may be dependent on other Modification timings and the suitability of a release. No functionality overlap with other Modifications has been identified at the time of undertaking this Impact Assessment.

6.3 Costs and Charges

This section indicates the quote for all phases of application development stage for this Modification. Note these costs assume a release of just this SEC Modification without any other Modifications or Change Requests in the release, which is not truly reflective of what the post-PIT 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, and PIT	Integration Testing, SIT	TTO (including Early Life Support for a period of 1 month following go-live)	Total
MP102B	£144,252	£44,304	£8,968	**£197,524**

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.
Implementation to Live (TTO)	The solution is implemented into production environments and made ready for use by Users as part of a live service.

6.3.1 Application Support Costs

Application Support costs of **£1,722** per month have been calculated for additional call volumes (seven simple complexity calls per month).

6.3.2 Changes to the DSP Contract

The contract updates will be detailed within the CAN and will impact the following schedules:

- Schedule 2.1: Review to determine whether updates are required as a result of the new functional requirements outlined within this FIA;
- DCC Obligations will require new obligations for the DCC to achieve the deliverables under this Modification;

- Schedule 4.1: Solution Design documents will need to be updated;
- Schedule 6.1 - to reflect delivery milestones;
- Schedule 7.1: Define payments associated with Sch 6.1 milestones.

Appendix A: Risks, Assumptions, Issues, and Dependencies

The tables below provide 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.

Risks

None at this time.

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
MP102B-A1	The effort and Charges presented in this FIA assume that the GUID List will remain unchanged, without having to add or remove items from it.	Open
MP102B-A2	The alerts that are suppressed as a result of this MP102B shall not be subject to any Performance Measures that would normally apply.	Open
MP102B-A3	It is assumed that the proposed suppression of AD1 notifications under MP102B would still enable DCC Service Users (e.g. DNOs) to meet their safety obligations - i.e. any failure of the DCC to report an actual power outage at premises (not caused by a OTA firmware update) hosting one of the specified Landis+Gyr ESME devices for up to 30 minutes due to the suppression of DSP's notification capability would not impact the safety or continuity of energy supply to consumers due to the presence of mitigations within the wider industry ecosystem outside of the provisions of the SEC.	Open
MP102B-A4	Real Landis+Gyr ESME that cause the AD1 alert following an OTA will be available to DCC for testing purposes and will cause the AD1 alert when tested in SIT.	Open
MP102B-A5	The Landis+Gyr ESME Devices that cause the AD1 Alert following an OTA do not send 8F35 or 8F36 (power restoration) Alerts during the same process and therefore will not result in uncorrelated 8F35/8F36 Alerts as a result of the suppression of AD1 Alerts following OTA, which would otherwise be flagged in the Power Outage Alert reports produced by the DCC.	Open
MP102B-A6	It will be acceptable for a single, consolidated, Power Outage Alert Suppression log to be distributed periodically to all Electricity Distributors.	Open

Issues

None at this time.

Dependencies

None at this time.

Appendix B: Glossary

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

Acronym	Definition
CR	DCC Change Request
DCC	Data Communications Company
DNO	Distribution Network Operator
DSP	Data Service Provider
ELS	Early Life Support
ESME	Electricity Smart Metering Equipment
FIA	Full Impact Assessment
I&C	Installation and Commissioning
OTA	Over the Air
PIA	Preliminary Impact Assessment
POA	Power Outage Alert
PIT	Pre-Integration Testing
RAID	Risks, Assumptions, Issues and Dependencies
ROM	Rough Order of Magnitude (cost)
RSA	Registered Supplier Agent
SAT	Service Audit Trail
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SIT	Systems Integration Testing
SLA	Service Level Agreement
SMETS	Smart Metering Equipment Technical Specification
SRV	Service Request Variant
SSI	Self Service Interface
UIT	User Integration Testing