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MP105

‘Sending SR11.2 to Devices in Suspended State’

Modification Report

Version 0.4



About this document

This document is a draft Modification Report. It currently sets out the background, issue, solution, impacts, costs, implementation approach 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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This document also has three annexes:

- **Annex A** contains the business requirements for the solution.
- **Annex B** contains the redlined changes to the SEC required to deliver the Proposed Solution.
- **Annex C** contains the full Data Communications Company (DCC) Preliminary Assessment response.

Contact

If you have any questions on this modification, please contact:

Joe Hehir

020 7770 6874

Joe.hehir@gemserv.com

1. Summary

This proposal has been raised by Chun Chen from the DCC.

Once a firmware entry is removed from the Central Products List (CPL), the Smart Metering Inventory (SMI) status for the impacted Devices will be set to be in a 'Suspended' state. While the Device is in a 'Suspended' state, only a Critical Service Request (SR) can be sent to those Devices, and any Non-Critical SRs will be rejected by Data Services Provider (DSP) with an E5¹ error.

As an exception, there are three Non-Critical SRs that will be allowed if the Device is 'Suspended'. However, SR 11.2 'Read Firmware Version' is not one of these and will be rejected by the DSP if it is sent while the Device is 'Suspended'.

The scenario in which this causes an issue is if the SR 11.3 'Activate Firmware' response for successful firmware activation is not received by the DSP. In this scenario the Device will remain in the 'Suspended' state even though the new firmware is now activated on the Device. Some Suppliers have an automated retry of SR 11.3 in this scenario. However, if it returns a response it will not update the status of the Device as the firmware is already activated.

The Proposed Solution is for the DCC is to design a solution to facilitate the DCC processing of SR 11.2 where a Device has a SMI Status of 'Suspended'. SR 11.2 will be added to the exception list for the E5 authorisation check. This would allow the DCC Service User to read the new firmware version on the Device and subsequently update this information in the SMI. The SMI status would then be updated based on the SR 11.2 response while the Device is in the 'Suspended' state. In addition, where a Service User implements an automated retry of SR 11.3, the response will be used to update the SMI with the new firmware version and subsequently the status of the Device.

This modification's impacts will be limited to the DCC and is expected to cost £0 – £150,000² to implement. We recommend this is a Self-Governance Modification and the targeted implementation date is 4 November 2021 (November 2021 SEC Release).

2. Issue

What are the current arrangements?

Once a firmware entry is removed from the CPL, the SMI status for the impacted Devices will be set to be in a 'Suspended' state. While the Device is in a 'Suspended' state, only a Critical SR can be sent to those Devices, and any Non-Critical SRs will be rejected by the DSP with an E5 error.

As an exception, the following Non-Critical SRs will be allowed if the Device is 'Suspended':

- SR 11.1 'Update Firmware'
- SR 6.23 'Update Security Credentials (CoS)'; and

¹ Failed Authorisation – Invalid Device Status

² Since this change only affects one Service Provider the exact costs cannot be made public, but can be obtained by certain Parties by contacting sec.change@gemserv.com.

- SR 2.2 'Top Up Device' with a Command Variant value of 2 (only for Smart Metering Equipment Technical Specifications (SMETS) 1 Devices).

This means SR11.2 'Read Firmware Version' will be rejected by the DSP E5 validation, when the Device is in a 'Suspended' state.

What is the issue?

The scenario in which this causes an issue is if the SR 11.3 'Activate Firmware' response for successful firmware activation is not received by the DSP. In this scenario the Device will remain in the 'Suspended' state even though the new firmware is now activated on the Device. There is no other recoverable method unless another new firmware update takes place.

How does this issue relate to the SEC?

What Service Requests a Service User can and cannot send is governed by the DCC User Interface Specification (DUIS), including for Devices which are in a 'Suspended' state. In addition, the DUIS also states how the response to SR 11.3 is handled by the DCC/DSP.

Therefore, any changes to Service Requests or DSP processing of these Service Requests will require a modification to change the DUIS and the DCC/DSP Systems.

What is the impact this is having?

What is the impact of doing nothing?

If nothing is done about this issue, there will be a small percentage of Devices that cannot be recovered from the 'Suspended' state if the SR 11.3 response is not received by the DSP. Currently the only way to resolve this is for a Service User to carry out another firmware update, which is a waste of time and effort.

What Device types are impacted?

SECAS notes that Electricity Smart Metering Equipment (ESME), Gas Smart Metering Equipment (GSME), Prepayment Meter Interface Device (PPMIDs) and Home Area Network (HAN) Connected Auxiliary Load Control Switches (HCALCSs) could all be suspended on the CPL.

3. Solution

Proposed Solution

Updating the Device status using SR 11.2

The Proposed Solution is for SR 11.2 to be added to the exception list for the E5 authorisation check. This would allow the DCC Service User to read the new firmware version on the Device and subsequently update this information in the SMI. The SMI status would then be updated based on the SR 11.2 response while the Device is in the 'Suspended' state.

If the Response to SR 11.2 from a 'Suspended' Device indicates that a new firmware has been activated, then the Device needs to be "unsuspended"; this is done by updating the status in SMI to the status it held immediately prior to its suspension. DCC Alert N29 'Device Restored from Suspension' will also be sent to the Responsible Import Supplier and to the Responsible Network Operator. This behaviour is the same as that of processing the Response to SR 11.3 'Activate Firmware' from a 'Suspended' Device.

Note the behaviour for a Gas Proxy Function (GPF) will remain unchanged and will not be impacted by this modification. The existing functionality is to send the DCC Alert N52 'GSME Firmware Version Mismatch' to the Service Users, if the received GSME firmware version, returned by the GPF, is different from the corresponding GSME's firmware version available in SMI.

Updating the Device status using SR 11.3

Some Supplier systems have an automated retry of SR 11.3 if it does not receive the SR 11.3 response for successful firmware activation.

Currently, if the retry of SR 11.3 responds with the correct new firmware version, it does not update the SMI status for the Device. Therefore, in addition to adding SR 11.2 to the exception list when a Device is suspended, the response to the automated retry of SR 11.3 will be used to update the SMI status in the same way in which the DCC is proposing to do with SR 11.2.

4. Impacts

This section summarises the impacts that would arise from the implementation of this modification.

SEC Parties

SEC Party Categories impacted			
✓	Large Suppliers	✓	Small Suppliers
	Electricity Network Operators		Gas Network Operators
	Other SEC Parties	✓	DCC

Suppliers

Suppliers will be impacted by this modification as they will have the capability to send SR 11.2 when a Device is in a 'Suspended' state in the SMI, instead of it being rejected by the DCC E5 authorisation check.

Therefore, if upon a successful firmware update the SR 11.3 response is not received by the DSP, the Supplier can rectify the SMI status without having to attempt another firmware update.

In addition, if a Supplier has an automated retry on SR 11.3 in place and it produces a response, this response will be used to update the Device status in the SMI.

DCC

The DCC will be impacted by this modification as it will need to design a solution that allows Service Users to send SR 11.2 whilst a Device is 'Suspended' in the SMI. The DCC will also need to ensure the SMI is updated resulting from the automated retry of SR 11.3 that some Supplier shave in place.

DCC System

Of the DCC's Service Providers, this modification is expected to impact the DSP only. The DSP will need to facilitate the processing SR 11.2 where a Device has a SMI Status of 'Suspended' as well as use the response to the automated retry of SR 11.3 to update the Device status on the SMI.

No changes are needed to the DUIS or Message Mapping Catalogue (MMC) schema. However, DUIS documentation will need to be updated to describe the change in behaviour to SR 11.2 and 11.3 processing.

This modification will require Pre-Integration Testing (PIT), Systems Integration Testing (SIT) and User Integration Testing (UIT).

The full impacts on DCC Systems and DCC's proposed testing approach can be found in the DCC Preliminary Assessment response in Annex C.

SEC and subsidiary documents

The following parts of the SEC will be impacted:

- Appendix AD 'DCC User Interface Specification'

This will be a text-only change to the DUIS. No changes are required for the Extensible Markup Language (XML) Schema.

The changes to the SEC required to deliver the proposed solution can be found in Annex B.

Consumers

If nothing is done about this issue, more Devices will be wrongfully 'suspended'. Suppliers may not be able to communicate with the meter and therefore estimate consumption. In addition, if 'Suspended' in prepayment mode, the Supplier cannot send down emergency credit, set up emergency credit or send top-ups.

Other industry Codes

This modification will not have any impacts on other industry Codes.

Greenhouse gas emissions

This modification will not cause any greenhouse gas emissions.

5. Costs

DCC costs

The initial estimated DCC implementation costs to implement this modification were £75,000. This was based on the Proposed Solution only seeking to utilise SR 11.2.

However, the Proposed Solution has since increased in scope and will seek to utilise the response to the SR 11.3 retry as well. Consequently, the estimated DCC implementation costs to implement this modification is £0 - £150,000. The breakdown of these costs are as follows:

Breakdown of DCC implementation costs	
Activity	Cost
Design, Build and Pre-Integration Testing (PIT)	£0 - £150,000 ³
Systems Integration Testing (SIT)	TBC
User Integration Testing (UIT)	TBC
Implement to Live	TBC

More information can be found in the DCC Preliminary Assessment response in Annex C.

SECAS costs

The estimated SECAS implementation costs to implement this modification is two days of effort, amounting to approximately £1,200. The activities needed to be undertaken for this are:

- Updating the SEC and releasing the new version to the industry.

SEC Party costs

Parties did not indicate that they would incur any costs as a result of this modification during Working Group meetings. However, we are seeking feedback as part of this Refinement Consultation. Please provide us with any costs your company would incur.

6. Implementation approach

Recommended implementation approach

SECAS is recommending an implementation date of:

- **4 November 2021** (November 2021 SEC Release) if a decision to approve is received on or before 4 August 2021; or

³ Since this change only affects one Service Provider the exact costs cannot be made public, but can be obtained by certain Parties by contacting sec.change@gemserv.com.

- **3 November 2022** (November 2022 SEC Release) if a decision to approve is received after 4 August 2021 but on or before 3 August 2022.

This modification will impact the DUIS and for efficiency, should therefore be implemented in a scheduled SEC Release in which other DUIS changes will be implemented. This would minimise SEC Party costs as well. The DCC has advised that it will need a three-month lead time to implement this modification which is why we are targeting a decision by 4 August 2021. This would provide enough lead time to implement this modification in the November 2021 SEC Release.

7. Assessment of the proposal

Observations on the issue

Views of SEC Parties

A Large Supplier expressed its support for the proposed change as this will enable better management of Devices to avoid unnecessary removal and/or inconvenience to the customer.

Views of the Change Sub-Committee

The Change Sub-Committee agreed that the issue identified under this proposal is clearly defined and understood. It had no other comments.

Solution development

What Devices are in scope?

SMETS1 Devices

Security Sub-Committee (SSC) Members queried whether the solution would be applicable to SMETS1 Devices. They noted that the need to raise another modification specific to SMETS1 Devices would cause unnecessary delay to provide a solution to the issue at hand.

The DCC confirmed that the same solution/process will apply to both SMETS1 and SMETS2 Devices so there is no need for a further modification to address SMETS1.

PPMIDs and HCALCSs

SECAS advised that only ESME and GSME are in the scope of this modification. A Supplier queried whether GSME is in scope due to the note about the GPF in the DCC's Preliminary Assessment (explained below). The DCC confirmed that GSME is in scope and the solution would work the same as it would for ESME. However, SR 11.2 must be sent directly to the GSME and not the GPF.

The solution could also be applied to PPMIDs and HCALCSs, but a separate modification is needed to extend SR 11.2 to these two Devices. This is currently proposed by [SECMP0007 'Firmware updates to IHDs and PPMIDs'](#) which is targeted for the November 2021 SEC Release. SECAS note this modification is not dependant on SR 11.2 being expanded to include PPMIDs and HCALCSs.

SECAS confirmed IHDs are not in scope as they are not listed on the Central Products List (CPL).

Will the solution be automated?

SECAS gave an overview of the first DCC Preliminary Assessment. To resolve this issue, the DCC proposed adding SR 11.2 to the exception list of Non-Critical SRs that can be used whilst a Device is 'Suspended'. This would allow the SMI status to be updated based on the SR 11.2 response while the Device is in the 'Suspended' state.

A Working Group member questioned whether the resulting update in the Device SMI status would require manual intervention from Users. The DCC confirmed that the Device status would update automatically in the SMI and that no manual intervention is required from Users.

GPF/GSME firmware version mismatches

The DCC noted that the modification does not propose changes Gas Proxy Function (GPF) behaviour. If there is a Gas Smart Metering Equipment (GSME) firmware version mismatch on the GPF, the existing functionality is to send the DCC Alert N52 'GSME Firmware Version Mismatch' to the Service Users. Therefore, in order to update the state of the GSME, a User would have to send SR 11.2 directly to the GSME and not the GPF.

Working Group change to the solution

Working Group members queried whether the Proposed Solution could be expanded to utilise SR 11.3 in addition to SR 11.2.

Members noted that Supplier systems have an automated SR 11.3 retry if it does not receive the SR 11.3 response for successful firmware activation. Although the SR 11.3 retry will respond with the correct new firmware version, it does not update the SMI status for the Device. Therefore, the Working Group asked the DCC to investigate if the response to the SR 11.3 automated retry could be used to update the SMI status in the same way in which the DCC is proposing to do with SR 11.2.

Members noted that the advantage with this method is that for "lost" SR 11.3 responses, the firmware version would be aligned to the SMI not only for 'Suspended' Devices, but all Devices. A Supplier noted that around 20% of all SR 11.3 responses are "lost" and so it is a big issue for Suppliers.

The DCC subsequently investigated this and confirmed in its second Preliminary Assessment that it would be possible to update the SMI using the SR 11.3 automated retry, as well as utilising SR 11.2 as originally proposed.

DCC SMETS1 considerations

The DCC noted that for SMETS1 Devices, the firmware version may not be available in the SR 11.3 response. This is because for most SMETS1 Devices, firmware updates are a not a two-step process (as with SMETS2 Devices where firmware distribution is carried out by SR 11.1 and activation by SR 11.3). Where the Device does not support two-step activation, the firmware update is triggered on SR 11.3 instead of SR 11.1. Therefore, the retry of SR 11.3 may not generate a response with the latest firmware version.

The DCC therefore advised that the requirement for updating the Device status using the SR 11.3 retry should be based on the “availability of the firmware version”.

Support for Change

Working Group views

The Working Group agreed with the benefits noted by SECAS and were supportive of this modification. Ultimately it would prevent their Devices from becoming wrongfully ‘Suspended’ upon a firmware update.

SSC views

The SSC noted that this modification would be of benefit to Users as it would provide more assurance for Devices remaining in an operational state after a firmware update.

Views against the General SEC Objectives

Proposer’s views

Objective (a)⁴

The Proposer believes that MP105 will better facilitate SEC Objective (a). The Proposed Solution will enable Service User to recover their Devices when they are wrongfully ‘Suspended’ and bring them back into an operation state.

Appendix 1: Progression timetable

Timetable	
Action	Date
Draft Proposal raised	18 Dec 2019
Presented to CSC for final comment and recommendations	2 Jan 2020
Panel converts Draft Proposal to Modification Proposal	17 Jan 2020
Business requirements developed with DCC	23 Mar 2020 – 3 Apr 2020
First Preliminary Assessment requested	6 Apr 2020
First Preliminary Assessment returned	4 May 2020
Modification discussed with Working Group	3 Jun 2020
Second Preliminary Assessment requested	17 Jul 2020
Second Preliminary Assessment returned	27 Aug 2020
Refinement Consultation	14 Sep 2020 – 5 Oct 2020
Impact Assessment costs approved by Change Board	21 Oct 2020

⁴ To facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers’ premises within Great Britain.

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
CoS	Change of Supply
CPL	Central Products List
CSC	Change Sub-Committee
DCC	Data Communications Company
DSP	Data Services Provider
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
GSME	Gas Smart Metering Equipment
GPF	Gas Proxy Function
HAN	Home Area Network
HCALCS	Home Area Network Connected Auxiliary Load Control Switch
IHD	In-Home Display
MMC	Message Mapping Catalogue
PIT	Pre-Integration Testing
PPMID	Prepayment Meter Interface Device
RoM	Rough Order of Magnitude
SIT	System Integration Testing
SMETS	Smart Metering Equipment Technical Specifications
SMI	Smart Metering Equipment Technical Specifications
SR	Service Request
UIT	User Integration Testing
XML	Extensible Markup Language

MP105 ‘Sending SR11.2 to Devices in Suspended State’

Business requirements – version 1.1

About this document

This document contains the business requirements that support the solution for this Modification Proposal. It sets out the requirements along with any assumptions and considerations. The DCC will use this information to provide an assessment of the requirements that help shape the complete solution.

1. Business requirements

This section contains the functional business requirements. Based on these requirements a full solution will be developed.

Business Requirements	
Ref.	Requirement
1	The DCC shall process Service Request (SR) 11.2 'Read Firmware Version' where a Device has a Smart Metering Inventory (SMI) Status of 'Suspended'.
2	Upon a Service Users automated second attempt of SR 11.3 'Activate Firmware', the response shall update the SMI with the new firmware version and subsequently the status of the Device.

This document contains requirements for multiple solution options, and an assessment for each option is to be provided. The table below summarises the requirements that make up each solution option:

Solution Options		
Option	Req. 1	Req. 2
Option 1	✓	
Option 2	✓	✓

2. Considerations and assumptions

This section contains the considerations and assumptions for each business requirement.

2.1 Requirement 1: The DCC shall process SR11.2 'Read Firmware Version' where a Device has a SMI Status of 'Suspended'

It is possible for the DCC not to receive the SR11.3 'Activate Firmware' response for successful firmware activation even if firmware has been successfully activated on a Device. This is also the case with future activated firmware, where the Service User may not receive the Alert for successful activation. In this scenario the Device will remain in the 'Suspended' state in the SMI, even though the new firmware is now activated on the Device.

There is currently no other recoverable method unless another new firmware update takes place.

SR11.2 needs to be added to the exception list for the E5 authorisation check. This would allow the DCC Service User to read the new firmware version on the Device and subsequently update this information in the SMI. The SMI status would then be updated based on the SR11.2 response while the Device is in the 'Suspended' state.

2.2 Requirement 2: Upon a Service Users automated second attempt of SR 11.3 'Activate Firmware', the response shall update the SMI with the new firmware version and subsequently the status of the Device.

Some Supplier systems have an automated retry of SR 11.3 if it does not receive the SR 11.3 response for successful firmware activation.

Currently, if the retry of SR 11.3 responds with the correct new firmware version, it does not update the SMI status for the Device. Therefore, the DCC is asked to investigate if the response to the automated retry of SR 11.3 could be used to update the SMI status in the same way in which the DCC is proposing to do with SR 11.2.

Members noted that the advantage with this method is that for "lost" SR 11.3 responses, the firmware version would be aligned to the SMI not only for 'Suspended' Devices, but all Devices. A Supplier noted that around 20% of all SR11.3 responses are "lost" and so it is a big issue for Suppliers.

3. Glossary

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

Glossary	
Acronym	Full term
CPL	Central Products List
DCC	Data Communications Company
SMI	Smart Metering Inventory
SR	Service Request

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MP105 ‘Sending SR11.2 to Devices in Suspended State’

Legal text – version 0.1

About this document

This document contains the redlined changes to the SEC that would be required to deliver this Modification Proposal.

Appendix AD ‘DCC User Interface Specification’

These changes have been redlined against Appendix AD version 3.1.

Amend Table 22 ‘Authorisation checks’ as follows:

3.2.4 Authorisation

The DCC shall verify that the User has permission to send the Service Request or Pre-Command as per the following steps and where authorisation checks are failed the following Response Code shall be added by the DCC to the Service Response that is sent to the sending User;

Authorisation Check	Process	Response Code
Validate the User Role	The sending organisation (User) as determined from the Business Originator ID and their associated User Role are checked to confirm it is a valid SEC party / User Role combination	E1
Verify that the User Role is allowed to use the Service Request or Signed Pre-Command	This is a User Role based check for the mapping between Service Requests and User Roles (see clause 3.1 Error! Reference source not found. – Service Request Matrix) i.e. that the User Role is that of a User within an Eligible User Role for that Request.	E2
Verify the status of the User	This is a status based check to find out if the User is suspended (not allowed to run that Service Request or Signed Pre-Command) at the time when the Service Request or Signed Pre-Command is received	E3
Verify that the User, in the User Role defined in the Service Request is an Eligible User for the Device	<p>This check is based on the Registration Data associated with the Device via MPxN lookup. Check that the User is an Eligible User in respect for that Device for the period that the Service Request pertains to.</p> <p>The checks for eligibility are as follows :</p> <ul style="list-style-type: none"> Confirm (using the Registration Data) that the User ID used to send the Request is that of a User that is an Eligible User for the Request. Authorisation is performed using the Device specified in the BusinessTargetID except for Non-Device Service Requests, where the BusinessTargetID is specified in the Service Request itself. <p>Note that this check is not applied for Critical Service Requests or Critical Signed Pre-Commands or for a limited number of specific Service Requests as documented in the Service Request Processing Document and stated explicitly within each Service Request definition in clause 3.8.</p> <p>Requests from a User that had ceased to be a registered Party more than 24 months ago will be rejected by the DCC Systems.</p>	E4

Authorisation Check	Process	Response Code
Verify that the Service Request or Signed Pre-Command is applicable to the Device status	<p>This is a check to confirm that the target Device has a status within the Smart Metering Inventory that enables the User to send it the particular Service Request or Signed Pre-Command</p> <p>This check is not applicable to Service Requests 8.2 (Read Inventory) and 12.1 (Request WAN Matrix) or to Critical Service Requests or Signed Pre-Commands. With the exception that it is applied for Signed Pre-Commands when the Device Status is 'Recovery'.</p> <p>Devices can only be communicated with in response to a Request if they are in a status of 'Commissioned', 'InstalledNotCommissioned', 'Whitelisted', 'Pending' or 'Recovered' in the Smart Metering Inventory.</p> <p>The DCC shall, where the Device has a Smart Metering Inventory (SMI) Status of 'Suspended' prevent any Non-Critical Service Requests from being processed with the exception of, Service Requests 11.1 (Update Firmware), 11.2 (Read Firmware Version) and 6.23 (Update Security Credentials (CoS)).</p> <p>The DCC shall, where a Device has a Smart Metering Inventory (SMI) Status of 'Recovery' prevent any Service Requests relating to that Device from being processed with the exception of Non-Device Service Requests (subject to their specific validation). Note that where a Device has an SMI Status of 'Recovered' the Device's SMI Status immediately prior to it having the SMI Status of 'Recovery' shall be used in validation.</p>	E5

Authorisation Check	Process	Response Code
Verify that the Service Request or Signed Pre-Command is available for Local Command Services	<p>This is a check to confirm that a Service Request or Signed Pre-Command is available to Users for local delivery to a Device using Local Command Services including additional reference to the requesting User Role and SMI Status combination.</p> <p>A Service Request or Signed Pre-Command is not available to Users for local delivery using Local Command Services where the Service Request or Signed Pre-Command is one of the following;</p> <ul style="list-style-type: none"> • A Service Reference Variant of 8.1.1 – Commission Device • A Future Dated Service as defined by clause 2.6.3 <p>In addition, a Service Request or Signed Pre-Command can only be delivered locally in the following combinations of requesting User Role and SMI Status of the target Device:</p> <ul style="list-style-type: none"> • Where the User Role of the sender is either IS, ES or GS, the target Device within the request must have an SMI Status of either “Pending”, “Whitelisted”, “InstalledNotCommissioned” or “Commissioned”. • Where the User Role of the sender is either ED, GT, RSA or OU, the target Device within the request must have an SMI Status of either “InstalledNotCommissioned” or “Commissioned”. <p>Note that where a Device has an SMI Status of ‘Recovered’ the Device’s SMI Status immediately prior to it having the SMI Status of ‘Recovery’ shall be used in validation.</p>	E17
Verify that the Device exists	<p>This is a check to confirm that the target Device within the Service Request or Signed Pre-Command exists</p> <p>Note that this check is only applicable to Service Requests and Signed Pre-Commands that are addressed to a specified Device.</p> <p>For Non-Device Service Requests this Response Code (E19) shall be returned if the BusinessTargetID is not the DCC Access Control Broker ID.</p>	E19

Table 22 : Authorisation checks

If any of these checks fails at the point the Service Request or Signed Pre-Command is received by the DCC Systems or prior to execution for DCC Scheduled Services, the Service Request or Signed Pre-Command is rejected, no further checks are carried out and a Service Response is generated with the appropriate Response Code to inform the User of the issue identified. See clause 3.5.10 for Response Code details.

Amend DCC Alert Codes N50 and N51 within Table 41 'DCC Alert Codes' as follows:

3.6.3.4 DCC Alert Codes

DCC Alert Code	Alert Name	Event	Trigger	DCC Alert Recipient	SMETS Version Applicability
N50	Firmware Version no longer valid on the CPL	Device's Firmware Version updated in the Smart Metering Inventory, but Device Status not set to 'Suspended'	<p>Upon successful completion of Service Request 11.2 Read Firmware Version where the target Device is ESME, GSME or CHF and the Firmware Version returned by the Device is different from that in the SMI and it matches an entry on the CPL with a status of "Removed"</p> <p>OR</p> <p>Upon successful completion of Service Request 11.3 Activate Firmware where the Firmware Version returned by the Device is different from that in the SMI and it matches an entry on the CPL with a status of "Removed"</p> <p>OR</p> <p>Future Dated Firmware Activation Alert (Alert Code 0x8F66 or 0x8F67 and Message Code 0x00CA) received by the DCC Systems where the Firmware Version returned by the Device is different from that in the SMI and it matches an entry on the CPL with a status of "Removed"</p>	IS GS	All
N51	Invalid Firmware Version	<p>Device's Firmware Version is unknown (not in the CPL)</p> <p>Device's Firmware Version not updated in the Smart Metering Inventory</p>	<p>Upon successful completion of Service Request 11.2 Read Firmware Version where the target Device is ESME, GSME or CHF and the Firmware Version returned by the Device is different from that in the SMI and it doesn't match an entry on the CPL</p> <p>OR</p> <p>Upon successful completion of Service Request 11.3 Activate Firmware where the Firmware Version returned by the Device is different from that in the SMI and it doesn't match an entry on the CPL</p>	IS GS	All

Managed by

			OR Future Dated Firmware Activation Alert (Alert Code 0x8F66 <u>or 0x8F67</u> and Message Code 0x00CA) received by the DCC Systems where the Firmware Version returned by the Device is different from that in the SMI and it doesn't match an entry on the CPL		
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Amend Section 3.8.120.4 'Additional DCC System Process' as follows:

3.8.120.4 Additional DCC System Processing

The DCC Systems shall monitor all Responses received to this Service Request.

Where the DCC identifies any Response ~~which indicates the successful processing of the activate firmware Command (executionOutcome = Success) on a Device~~ and the Firmware Version returned by the Device matches an entry on the CPL for that Device Model, an update to the Smart Metering Inventory shall be made by the DCC.

The DCC Systems shall update the DeviceFirmwareVersion data item within the Smart Metering Inventory to record the new DeviceFirmwareVersion value for the specified Device ID received in the Response. Where the DeviceFirmwareVersion for the specified Device is now the current valid version, and the Device Status was 'Suspended' and the Firmware Version returned by the Device matches an entry on the CPL for that Device Model with a status of "Current" the DCC Systems shall update the Device Status to the status it held immediately prior to its Suspension" and DCC Alert N29 will be sent to the Responsible Supplier and to the Electricity Distributor or Gas Transporter.-

If the Firmware Version returned by the Device matches an entry on the CPL for that Device Model with a status of "Removed", the SMI Firmware Version will be updated, but the Device Status will not be set to 'Suspended'. In this case DCC Alert N50 will be sent to the Responsible Supplier as a warning.

Note that if the Firmware Version returned by the Device is invalid (doesn't match an entry on the CPL for that Device Model) DCC Alert N51 will be sent to the Responsible Supplier as a warning and the Smart Metering Inventory Firmware Version will not be updated.

SEC Modification Proposal, SECMP0105, DCC CR1397

Sending SR11.2 to Devices in Suspended State Preliminary Impact Assessment (PIA)

Version:	0.25
Date:	27th August 2020
August	DCC
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1 Document History

1.1 Revision History

Revision Date	Revision	Summary of Changes
26/08/2020	0.1	Initial version, for DCC internal review
27/08/2020	0.2	Updated following an internal review
27/08/2020	0.25	Updated cost, created Annex

1.2 Associated Documents

This document is associated with the following documents:

Ref	Title and Originator's Reference	Source	Version
1	MP105-Modification-Report	SECAS	0.3
2	MP105 June 2020 Working Group summary	SECAS	
3	MP105 Business Requirements	SECAS	1.1

References are shown in this format, [1].

1.3 Document Information

The Proposer for this Modification is Chun Chen of Data Communications Company (DCC). The original proposal was submitted in December 2010 and the Preliminary Impact Assessment (PIA) was requested of DCC on 14th April 2020 and submitted on 4th May 2020. This was issued as DCC CR 1338.

Following a review of the solution suggested in the PIA in June 2020 Working Group Meeting, a second additional requirement is included in this Modification Proposal. The revised PIA for the solution with the additional requirement was requested of DCC on 17th July 2020, and is now denoted by the DCC CR 1397.

2 Context and Requirements

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

The SEC Definitions, issue statement, and requirements have been provided by SECAS and the Proposer.

2.1 Current Arrangements

Once a firmware entry is removed from the Central Products List (CPL), the Smart Metering Inventory (SMI) status for the impacted Devices is set to a 'Suspended' state. While the Device is in a 'Suspended' state, only a Critical Service Request (SR) can be sent to those Devices, and any Non-Critical SRs will be rejected by the Data Service Provider (DSP) with an E5 error, "Failed Authorisation – Invalid Device Status".

As an exception, the following Non-Critical SRs will be allowed if the Device is 'Suspended':

- SR11.1 'Update Firmware';
- SR6.23 'Update Security Credentials ()';
- SR2.2 'Top Up Device' with a Command Variant value of 2 (only for Smart Metering Equipment Technical Specifications (SMETS) 1 Devices).

This means SR11.2 'Read Firmware Version' will be rejected by the DSP E5 validation when the Device is in a 'Suspended' state.

2.2 What is the issue?

The scenario in which this causes an issue is if the SR11.3 'Activate Firmware' response for successful firmware activation is not received by the DSP from a Device in 'Suspended' state. In this scenario, the Device will remain in the 'Suspended' state even though the new firmware is now activated on the Device.

Also, SR11.2 'Read Firmware Version' will be rejected by the DSP E5 validation, when the Device is in a 'Suspended' state.

There is no other recoverable method unless another new firmware update takes place and successful firmware activation response is received by the DSP.

2.3 Impact of the issue

There will be a percentage of Devices that cannot be recovered from the 'Suspended' state if the SR11.3 successful response is not received by the DSP.

Currently, the only way to resolve this is for a Service User to carry out another firmware update for a successful response, which is a waste of time and effort.

3 Description of Solution

The objective of this SEC Modification is to provide DCC Users with the ability to update the SMI Device Status for one or multiple Suspended device with valid firmware, without having to send repeated firmware updates.

Requirement 1:

The DCC Data Systems shall process SR 11.2 'Read Firmware Version' where a Device has a Smart Metering Inventory (SMI) Status of 'Suspended'.

The SMI status would then be updated based on the SR11.2 response while the Device is in the 'Suspended' state. This would allow the DCC Service User to read the new firmware version on the Device and subsequently update this information in the SMI.

Requirement 2:

Upon a Service User's automated second attempt of SR 11.3 'Activate Firmware', the response shall update the SMI with the new firmware version and subsequently the status of the Device.

3.1 SEC Changes

The DCC and Service Providers have reviewed the requirements, solution and expect changes will be required in SEC Appendix AD - DCC User Interface Specification (DUIS).

Section 3.8.119.4 and section 3.8.120.4 of SEC Appendix AD shall be updated to include the change in DCC processing for 'Suspended' Device based on the response of SR 11.2 and SR11.3 respectively.

There will not be any changes in DUIS XML schema or MMC XML schema. The actual change to the "Additional DCC System Processing" sections will be provided during the Full Impact Assessment (FIA).

3.2 DSP Solution Overview

Solution for Requirement 1:

DCC Data Systems will modify the E5 validation check so that an SR11.2, targeted at a 'Suspended' Device, is not rejected by the DCC Data Systems.

If the Response to SR11.2 from a 'Suspended' Device indicates that new firmware has been activated, then the Device will be unsuspended by updating the status in SMI to the status it held immediately prior to its suspension. DCC Alert N29 (Device Restored from Suspension) will also be sent to the Responsible Import Supplier and to the Responsible Network Operator. This behaviour is the same as that of processing the Response to SR11.3 (Activate Firmware) from a 'Suspended' Device.

It should be noted that the Response to SR11.2 received from a GPF would not be treated as a valid input for restoring the associated GSME from the 'Suspended' state. The existing functionality is to send the DCC Alert N52 (GSME Firmware Version Mismatch) to the Service Users if the received GSME firmware version, returned by the GPF, is different from

the corresponding GSME's firmware version available in SMI. This behaviour will remain unchanged.

Solution for Requirement 2:

DCC Data Systems will modify the processing of Service Request 11.3 Activate Firmware such that the value of `ActivateImageResponseCode` in the Response will no longer be considered as criteria for determining whether to update the SMI. If the Device Response contains a valid version (CPL status "Current") of the firmware, DSP will update the `DeviceFirmwareVersion` and `Device Status` (that it held immediately prior to its Suspension) in the SMI, irrespective of the value held by '`ActivateImageResponseCode`'.

This approach is particularly helpful for SMETS1 Device which does not follow the 2 step firmware upgrade process - download and activate. A retry of SR 11.3 is handled differently by SMETS1 Service Providers (S1SP) and a failed activation response may not contain firmware version.

3.3 Other Solution Impacts

Apart from the DSP, no other DCC Components are impacted by this change.

4 Impact on DCC Systems, Processes and People

This section describes the impact of SECMP0105 on DCC Services and Interfaces that impact Users and/or Parties.

4.1 System Components

Change in Response processing of SR 11.2 and 11.3 require a change in Request Management and Data Management components at DSP.

4.2 Security Impact

There is no material impact on the DSP security solution as a result of this change. The implementation will be security assured during the implementation phase. This includes reviewing designs, test artefacts and providing consultancy to the implementation and test teams.

A more detailed security impact will be carried out as part of the Full Impact Assessment.

At this stage, a penetration test and updates to protective monitoring are not thought to be required.

4.3 Technical Specifications

There will be changes in DUIS (no change in the XML schema) and corresponding changes in DUGIDS for the changes in DUIS. No other changes in any Technical Specification are expected.

4.4 Integration Impact

The revised behaviour of SR11.2 and 11.3 is expected to require amendments to associated Systems Integration and User Integration Testing scenarios. An appropriate level of SIT and UIT will be carried out prior to progressing the release of this change to the Production environment, but this is not included in the PIA.

4.5 Infrastructure Impact

There will be no change to the infrastructure design as a result of this change.

The Modification does not impact the DSP's resilience or Disaster Recovery implementation.

4.6 Application Support

No changes to Application Support are expected.

4.7 Service Impact

No material impact is expected for the Operations team and no changes to SLAs are expected. The impact will be validated further as part of the FIA.

4.8 Safety Impact

The following areas will not be impacted:

- Systems Safety Impact
- Occupational Health, Safety and Environment Impact

- Systems Safety Deliverables

Negligible impact to DSP safety programme in terms of timescales and resourcing, any necessary updates to the DSP safety analysis due to this CR will be accounted for in the planned annual update of the Safety Case deliverables.

A full Safety Impact Assessment will be carried out as part of the production of the FIA.

4.9 Contract Schedules

No changes to contracts are expected, but this will be re-evaluated for the FIA.

5 Implementation Timescales and Approach

As this change affects the DUIS document, it will need to be implemented as part of a scheduled release. Notwithstanding in which release this change is implemented, based on the current response from the Service Provider, the elapsed time for implementation from project initiation through to PIT completion will be up to 3 months.

The release lifecycle duration will be confirmed as part of the FIA.

5.1 Implementation Approach

Implementation of this change is assumed to follow a hybrid of agile and waterfall methodology. The release lifecycle duration will be confirmed as part of the FIA.

5.2 Testing and Acceptance

It is assumed that the change will be implemented and tested as part of a major release and will include release based regression testing in SIT and UIT.

6 Costs and Charges

The table below details the cost of delivering the changes and Services required to implement this Modification Proposal.

The scope of supply under this PIA includes design, development (build), system testing, and performance testing within the PIT environments.

The Rough Order of Magnitude cost (ROM) shown below describes indicative costs to implement the functional requirements as assumed above. The price is not an offer open to acceptance. It should be noted that the change has not been subject to the same level of analysis that would be performed as part of a Full Impact Assessment and as such there may be elements missing from the solution or the solution may be subject to a material change during discussions with the DCC. As a result, the final offer price may result in a variation.

6.1 Design, Build and Testing Cost Impact

The table below details the cost of delivering the changes and Services required to implement this Modification. For a PIA, only the Design, Build and PIT indicative costs are supplied.

Price Range	Design, Build and PIT
Sending 11.2 to Devices in Suspended State	£0 - 150,000

Based on the existing requirements, the total fixed price cost for a Full Impact Assessment by the Service Provider is **£11621.10** and would be expected to be completed in 30 working days.

7 Risk, Assumptions, Issues, and Dependencies

In the following sections, Risks, Assumptions, Issues, and Dependencies have been identified. Two clarifications are also requested.

Further RAID may be established as part of the Working Group reviews and the FIA.

7.1 Risks

None at this time.

7.2 Assumptions

None at this time.

7.3 Issues

None at this time.

7.4 Dependencies

None at this time.

7.5 Clarification

None at this time.

Appendix A: Glossary

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

.Acronym	Definition
CH	Communications Hub
COS	Change of Supplier
CPL	Central Products List
CR	DCC Change Request
DCC	Data Communications Company
DSP	Data Service Provider
DUGIDS	DCC User Gateway Interface Design Specification
DUIS	DCC User Interface Specification
FIA	Full Impact Assessment
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
MMC	Message Mapping Catalogue
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing
ROM	Rough Order of Magnitude (cost)
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SIT	Systems Integration Testing
SMI	Smart Metering Inventory
SMETS	Smart Metering Equipment Technical Specification
SP	Service Provider
SR	Service Request
SRV	Service Request Variant
UIT	User Integration Testing
XML	eXtensible Markup Language