

SEC Modification Proposal, SECMP0178, DCC CR4837

Removing DSP Validation against the Smart Metering Inventory (SMI) Join Status for SR8.8.x Preliminary Impact Assessment (PIA)

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1 Executive Summary

The Change Board are asked to approve the following:

- Total cost to complete the Full Impact Assessment of **£6,075**.
- The timescales to complete the Full Impact Assessment of 40 working days.
- ROM costs for SECMP0178, up to the end of Pre-Integration Testing (PIT) of £10,000 to 75,000.

Problem Statement and Solution

During the Install and Commissioning (I&C) process, an engineer is on site and installs the Devices, after which a Communications Hub (Comms Hub) is also installed. At this point, the engineer proceeds to commission the meter which is done by the Service User sending a series of Join Commands, Service Reference Variants (SRV)8.7.x for Devices to connect to a Comms Hub. Once successfully joined, the Devices are then commissioned and therefore complete the I&C process. There are occasions when the initial join was unsuccessful or there was an issue with the Devices being joined, and therefore the engineer will need to unjoin the Devices before attempting to re-join again.

The Proposed Solution aims to remove DSP validation of Join status in the SMI when sending an Unjoin Service Request.

Modification Benefits

This will allow the sending of unjoin commands irrespective of the join status held in the SMI, and would prevent the Response Code E080801 from being created in association with an unjoin command.

Implementing this solution will reduce the number of I&C failures, and remove ongoing costs to manually correct the SMI database to allow Users to reuse any Devices.

If the issue is left unresolved, more Devices will not be commissioned and will therefore not provide smart functionality and the benefits of smart features to consumers.

2 Document History

2.1 Revision History

Revision Date	Revision	Summary of Changes
19/10/2022	0.1	Initial version, for DCC internal review
21/10/2022	0.2	Review completed

2.2 Associated Documents

This document is associated with the following documents:

Ref	Title and Originator's Reference	Source	Issue Date
1	MP178-Modification-Report-v0.6	SECAS	24/08/2022
2	MP178 - Business Requirements-v0.4	SECAS	24/08/2022

References are shown in this format, [1].

2.3 Document Information

The Proposer for this Modification is David Walsh of the Data and Communications Company. The Modification was raised by SEC in July 2021.

The Preliminary Impact Assessment (PIA) was requested of DCC on 3rd October 2022.

3 Context and Requirements

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 Current Arrangements

During the Install and Commissioning (I&C) process, an engineer is on site and installs the Devices, after which a Communications Hub (Comms Hub) is also installed. At this point, the engineer proceeds to commission the meter which is done by the Service User sending a series of Join Commands, Service Reference Variants (SRV) 8.7.x for Devices to connect to a Comms Hub. Once successfully joined, the Devices are then commissioned and therefore complete the I&C process. There are occasions when the initial join was unsuccessful or there was an issue with the Devices being joined, and therefore the engineer will need to unjoin the Devices before attempting to re-join again. Alternatively, when a Device is being exchanged, it needs to be un-joined before the new Device can be joined.

3.2 Problem and Context

The secure exchange of data between two Devices on the same Smart Meter Home Area Network (SMHAN) at the application layer requires pair-wise authorisation of the two Devices. The process of authorising two Devices to communicate is referred to as 'Joining' and the removal of the authorisation is referred to as 'Un-joining'. The following SRVs for joining and un-joining are available to DCC Users:

- 8.7.1 Join Service (Critical)
- 8.7.2 Join Service (Non-Critical)
- 8.8.1 Unjoin Service (Critical)
- 8.8.2 Unjoin Service (Non-Critical)

The DCC evaluates the responses from the Devices and tracks the status of the joining in the Smart Meter Inventory (SMI).

An issue has been brought to the DCC's attention whereby the on-site I&C process fails when the Data Service Provider (DSP) does not receive successful messages for joins of Service Reference Variants (SRVs) 8.7.x. This prevents the Service User from being able to send an Unjoin command as the business validation on the SRV 8.8.1 'Unjoin Service (Critical)' or 8.8.2 'Unjoin Service (Non-Critical)' commands check that a Device is joined to the Smart Metering Inventory (SMI) to allow it to be un-joined. For example, there may be problems joining a Consumer Access Device (CAD) to Electricity Smart Metering Equipment (ESME).

In these cases, the only way to complete the I&C process is a manual update of the SMI. This is completed by the DCC at a significant cost per update. This is because:

- it is not possible to continue the I&C process by retrying the Join; and/or
- there have been instances where the Device will reject the retry of the Join command (SRV 8.7.x) if a previous Join was already successfully completed.

In the year after August 2020 there were four cases (across different Suppliers) where the response to the SRV 8.7.2 'Join Service (Non-Critical)' was not received by the DSP despite

the join working within the ESME. Hence, the Service User is unable to send an Unjoin command as the business validation on the SRV 8.8.1 'Unjoin Service (Critical)' or 8.8.2 'Unjoin Service (Non-Critical)' commands check that only Devices joined in the SMI may be un-joined. Note that SRV 8.8.1 is used with Critical commands, while SRV 8.8.2 is used with non-Critical commands.

There are instances where if the Service User sends SR 8.7.2 again to the ESME then this will pass through the DSP, but it is then rejected at the ESME as it is already joined. Smart Energy Code (SEC) Schedule 8 'GB Companion Specification' (GBCS) mandates that Devices should accept a re-send of the SR 8.7.x 'Join Service' command, even if the Device is already joined (for example, it is already in the Device Log).

The DSP currently updates the SMI and sets up the join relationship depending on the response to the Join command. As part of the Unjoin command, SRV 8.8.2 validates the SMI join relationship. For example, the system only allows the Unjoin command (SR 8.8.x) if Devices are already joined to each other, otherwise the DSP will reject the Service Request with the following error code:

Response Code	Response Code Description
E080801	According to the SMI the 'Other Device' is not joined to the Business TargetID Device

There are no Smart Metering Technical Specifications (SMETS), GBCS, Security or any other SEC requirement mandating that the DSP must apply such validation other than what is defined in the DCC User Interface Specification (DUIS).

3.3 Impact of the Issue

If the issue identified under this proposal is not addressed, there will be:

- further I&C failures
- an ongoing cost to manually correct the SMI database to allow Users to reuse any Devices.

Each manual database correction has a significant charge to the DCC and any firmware fixes of meter defects normally take more than 12 months to deploy.

Up to July 2022 there has been five known incidences, and further incidents are expected.

If the issue is left unresolved, more Devices will not have been commissioned and will therefore not provide smart functionality and the benefits of smart features to consumers.

3.4 Business Requirements

The business requirements are as follows.

Requirement 1: Remove the DSP validation associated with the unjoin commands (SRV8.8.1 and SRV8.8.2) resulting in Response Code E080801

Use cases have arisen that would benefit from removing the DSP validation process, which is currently associated with the Unjoin command. The current manual workaround is costly and time consuming to update the SMI to reflect the correct status for each Device. This has led to unsatisfactory Consumer experience and costs.

A part of the Unjoin command, SRV8.8.2 validates the SMI Join relationship. The system only allows the Unjoin command (SRV8.8.x) if Devices are already joined to each other (in the SMI), otherwise the DSP will reject the Service Request with the error code: E080801.

Requirement 2: Update the DCC User Interface Specification (DUIS) to align with other Smart Energy Code (SEC) requirements of not mandating DSP validation of unjoin command

This requirement defines the delivery mechanism.

Process diagrams for the Unjoin commands are included in Appendix B at the end of this document.

4 Description of Solution

This section describes the impact of SECMP0178 on DSP, and interfaces that impact Users and/or Parties.

4.1 Overall Impact

The Proposed Solution aims to remove DSP validation of Join status in the SMI when sending an Unjoin Service Request. This will allow the sending of unjoin commands irrespective of the join status held in the SMI. This solution would prevent the Response Code E080801 from being created in association with an unjoin command.

The validation of SRV8.8.1 Unjoin Service (Critical) and SRV8.8.2 Unjoin Service (Non-Critical) in Request Manager will be modified to remove the check that the OtherDeviceID from the SRV is flagged in the SMI as being joined to the target Device of the SRV. The validation is contained in the strategy classes UnjoinCritical and UnjoinNonCritical. Any other validation in these strategy classes will remain unchanged.

The change will apply to SMETS1 and SMETS2, and to all versions of DUIS.

4.2 Security Impact

This change impacts on the conduct of Access Control Broker (ACB) validation checks, deactivating a current check. It does not impact the security posture of the service or its infrastructure, but, as with any change to security related code, its implementation will be security assured throughout. This assurance includes reviewing designs, test artefacts and providing consultancy to the implementation and test teams.

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

This change does not impact protective monitoring logging or configuration.

As it does not impact any interfaces, a penetration test is not deemed necessary.

An independent code review is not deemed necessary for this level of change.

4.3 Technical Specifications

Whilst there is no change to the DUIS schema, this change will require a DUIS uplift. Note that the removal of this validation check will require a change to the DUIS documentation, but it is assumed that the related error code will remain in the DUIS schema. Therefore, this change on its own does not require a DUIS schema uplift.

4.4 Integration Impact

The Modification does not introduce any changes to system integrations within the DCC Total System, as the changes to the functionality are encapsulated within the DSP component. As such, any testing executed by System Integration Testing (SIT) would be a repeat of a subset of the testing executed by PIT. Therefore, no SIT execution is proposed for this Modification.

It is not thought that this Modification will require User Integration Testing (UIT).

An element of regression testing will be carried out as part of the SEC Release that includes this change.

4.5 Infrastructure Impact

No infrastructure impact is expected from this Modification. It should be noted that the aggregated impact of many such changes to the DSP solution will ultimately result in a reduction of the available processing headroom assumed as part of the original Agreement. As such, it may be necessary for DSP to raise a Business as Usual (BAU) CR for the provision of additional infrastructure to ensure the DCC Total System does not experience performance problems that are the direct result of the accumulation of such changes.

The change does not impact the DSP resilience or Disaster Recovery implementation.

4.6 Service Impact

The changes noted above are not expected to alter traffic volumes significantly, nor to add to message processing time. No changes to Service Level Agreements (SLAs), particularly to Schedule 2.2 (Performance Measures and Reporting), or reporting are expected as a result of this change.

5 Implementation Timescales and Approach

This Modification is expected to be implemented in a future SEC Release. Design, Build, and PIT is expected to take approximately three months to complete after the CAN is signed.

Details of the implementation will be finalised in 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.

6 Costs and Charges

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 and non-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. 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.

£	Design, Build and PIT
DSP	£10,000 to 75,000

Although not included in this PIA, it is expected that there will be no integration testing costs associated with this Modification.

Based on the existing requirements, the total fixed price cost for a Full Impact Assessment by all Service Providers is **£6,075** and would be expected to be completed in 40 working days.

7 Risk, Assumptions, Issues, and Dependencies

In the following sections, Risks, Assumptions, Issues, and Dependencies (RAID) have been identified. Further RAID may be established as part of the FIA.

7.1 Risks, Issues, and Dependencies

None at this time.

7.2 Assumptions

Ref.	Assumption	Impact
MP178-AD1	DSP recommends this feature should be developed with a feature switch.	DCC believe this is not required for this change. This will be verified with the Working Group.
MP178-AD2	No integration testing is expected or required.	If not, costs and durations will increase.
MP178-AD3	The removal of the validation check will require a change to the DUIS documentation, but DSP has assumed that the related error code will remain in the DUIS schema.	The change does not require a DUIS schema uplift.

Appendix A: Glossary

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

Acronym	Definition
BaU, BAU	Business As Usual
CAD	Consumer Access Device
CAN	Contract Amendment Note
Comms Hub	Communications Hub
CR	DCC Change Request
DCC	Data Communications Company
DSP	Data Service Provider
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
FIA	Full Impact Assessment
GBCS	Great Britain Companion Specification
I&C	Install and Commissioning
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing
RAID	Risks, Assumptions, Issues, and Dependencies
ROM	Rough Order of Magnitude (cost)
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
SMHAN	Smart Meter Home Area Network
SMI	Smart Metering Inventory
SR	Service Request
SRV	Service Request Variant
UIT	User Integration Testing

Appendix B: Process Diagrams for Unjoin Commands



MP178-Process-Dia
grams.pdf