

SEC Modification Proposal, SECMP0178, DCC CR4837

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

Full Impact Assessment (FIA)

Version:

0.2

Date:

1st March, 2023

Author:

DCC

Classification:

Public

Contents

1	Executive Summary	3
2	Document History	4
2.1	Revision History	4
2.2	Associated Documents.....	4
2.3	Document Information	4
3	Solution Context and Requirements	5
3.1	Current Arrangements	5
3.2	Problem and Context.....	5
3.3	Impact of the Issue	6
3.4	Business Requirements	7
4	Solution Overview	9
4.1	Functional and Technical Solution Changes	9
4.1.1	Request Manager.....	9
4.1.2	Data Management.....	9
4.1.3	DUIS and DUGIDS Technical Specifications	9
4.1.4	Other Impacted Components	9
5	Testing Considerations	10
5.1	Pre-Integration Testing (PIT).....	10
5.2	System Integration Testing (SIT).....	10
5.3	User Integration Testing (UIT).....	10
6	Implementation Timescales and Releases.....	11
6.1	Change Lead Times and Timelines.....	11
6.2	SEC Release Allocation and Other Code Impacts	11
6.3	Costs and Charges.....	12
6.4	Changes to the Contract	12
	Appendix A: Glossary	13
	Appendix B: Assumptions	14

1 Executive Summary

The Change Board are asked to approve:

- Total cost to implement SECMP0178 of £40,404, which comprises:
 - £39,055 in Design, Build and PIT costs
 - £1,349 in release costs (SIT, UIT and Implementation)
- A timescale to complete the implementation of three months
- Include SECMP0178 in the June 2024 SEC Release

Problem Statement and Solution

During the Install and Commissioning (I&C) process, an engineer installs Devices and a Communications Hub (Comms Hub). An engineer will commission an Electricity Smart Metering Equipment (ESME) by sending a series of Join Commands, Service Reference Variants (SRV) 8.7.x for Devices to connect to the Comms Hub, but there may be cases where the response to the SRV 8.7.2 'Join Service (Non-Critical)' is 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. In these cases, the engineer will need to unjoin the Devices before attempting to re-join again.

Modification Benefits

The solution will remove DSP validation of Join status in the SMI when sending an Unjoin Service Request, which will allow the sending of unjoin commands irrespective of the join status held in the SMI, and will 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
28/02/2023	0.1	Initial compilation
01/03/2023	0.2	DCC review completed

2.2 Associated Documents

This document is associated with the following documents:

#	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
3	SECMP0178 CR4837 - PIA - Remove Validation against SMI join SR8.8.x v0.21	DCC	24/10/2022

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, and published on 21st October 2022.

This FIA was requested by SECAS on 9th January, 2023.

3 Solution Context and Requirements

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

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

3.1 Current Arrangements

It has been reported by Suppliers that the on-site Install and Commission (I&C) process for Devices can fail where the DSP does not receive successful messages for joins of SRVs 8.7.x, such as problems joining a Consumer Access Device (CAD) to Electricity Smart Metering Equipment (ESME). When this occurs, currently, the only way to complete the I&C process is a manual update of the Smart Metering Inventory (SMI) because:

- it is not possible to continue the I&C process by retrying the join
- there have been instances where the Device will reject the retry of the Join Command (SRV8.7.x) if a previous join was already successfully completed

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 (SR8.7.x) if a previous Join was already successfully completed.

In the 12 months 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

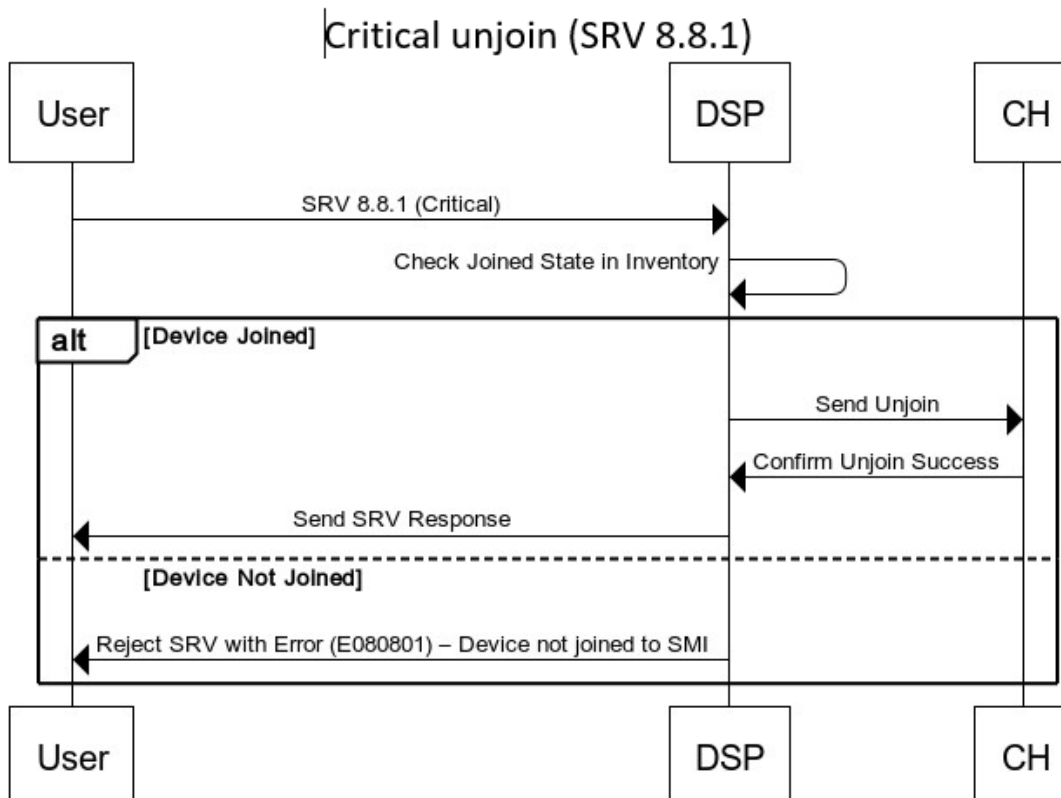
Use cases have arisen that would benefit from removing the DSP validation process, which is currently associated with the Unjoin command. The current manual workaround is costly and time consuming to update the SMI to reflect the correct status for each Device. This has led to unsatisfactory Consumer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

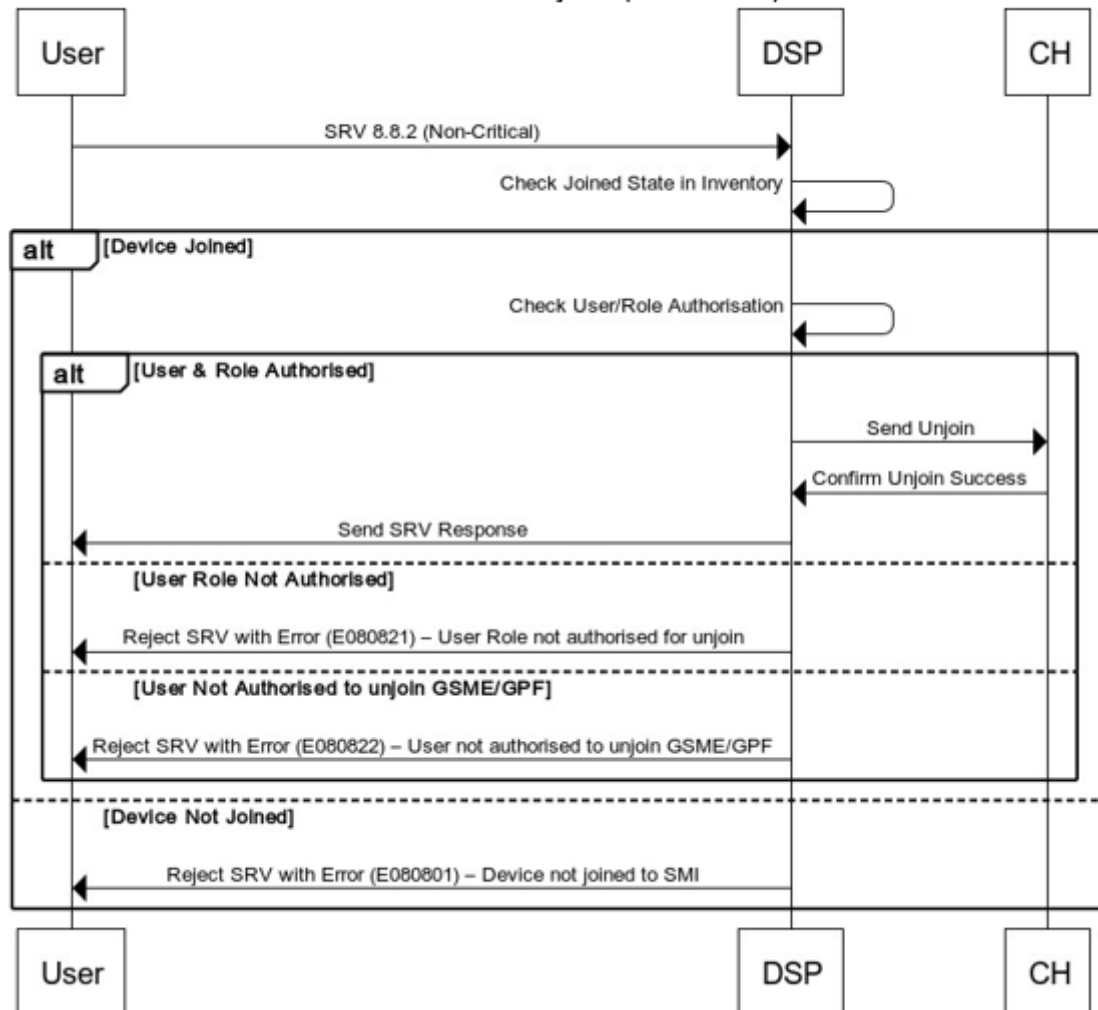
Requirement 2: Update the DCC User Interface Specification (DUIS) to align with other Smart Energy Code (SEC) requirements of not mandating DSP validation of unjoin command

This requirement defines the delivery mechanism.

Process diagrams for the Unjoin commands are shown following.



Non-Critical unjoin (SRV 8.8.2)



4 Solution Overview

DSP will modify the validation of SRV 8.8.1 Unjoin Service (Critical) and SRV 8.8.2 Unjoin Service (Non-Critical) 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.

4.1 Functional and Technical Solution Changes

The solution for this Modification requires changes to the following components:

4.1.1 Request Manager

Remove the check that the OtherDeviceID from the SRV is already joined to the target Device of the SRV (subject to feature switch).

4.1.2 Data Management

On processing a successful Unjoin response from the device, the Join record in the database is removed. This removal will be amended to tolerate no record being present to be removed.

4.1.3 DUIS and DUGIDS Technical Specifications

The change will apply to SMETS1 and SMETS2, and to all versions of DUIS. The removal of this validation check will require a change to the documentation, but the related error code will remain in the DUIS schema. Therefore, this change on its own does not require a DUIS schema uplift.

A change will be made to update Annex 8 of DUGIDS to remove the validation check E080801 from SRVs 8.8.1 and 8.8.2. No updates to the DUIS schema will be made a result of this documentation change.

4.1.4 Other Impacted Components

There will be no impacts to:

- Performance
- Infrastructure
- Security, including penetration testing
- Disaster Recovery

5 Testing Considerations

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

5.1 Pre-Integration Testing (PIT)

The DSP PIT team will design and implement the functional updates required to the DSP for the change, and will test to ensure DSP functionality aligns with the solution described in this FIA

PIT testing will include testing both existing updated DSP Use Cases, and new Use Cases development for this change. A series of regression tests will also be run. 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)

There is no System Integration Testing required, as the change is within a single component within the DCC Total System. A small amount of required System Regression testing will be required which will be covered by a Release CR for the selected SEC Release.

5.3 User Integration Testing (UIT)

A small amount of required System Regression testing will be required which will be covered by a Release CR for the selected SEC Release.

6 Implementation Timescales and Releases

This Modification is expected to be included in a SEC Release in June 2024. Implementation timescales will be finalised as part of the relevant SEC Release.

6.1 Change Lead Times and Timelines

From the date of approval (in accordance with Section D9 of the SEC), to implement Design, Build and PIT requires a lead time of approximately **three months**.

This Modification would be scheduled alongside other Modifications and CRs, and there might be a period of no activity for this Modification.

6.2 SEC Release Allocation and Other Code Impacts

This Modification is expected to be implemented as part of the June 2024 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 FIA.

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 "Release CR" also referred to as a "Post-PIT CR".

£	Design, Build, and PIT	Integration Testing, SIT and UIT	TTO	Total
SECMP0178	£39,055	£0	£1,349	£40,404

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 their 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 for a Release are brought together and tested as an integrated solution, ensuring all SP solutions align and operate as an end-to-end solution.
User Integration Testing (UIT)	Users are provided with an opportunity to run a range of pre-specified tests in relation to the relevant change.
Implementation to Live (TTO)	The solution is implemented into production environments and made ready for use by Users as part of a live service.

6.4 Changes to the Contract

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

- Schedule 2.1 (DCC Requirements): addition of new requirements for this change
- Schedule 4.1 (Contractor Solution): solution design documents
- Schedule 6.1 (Implementation Planning): addition of new milestones
- Schedule 7.1 (Charges and Payment): revisions to incorporate charges and payment

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
DUGIDS	DCC User Gateway Design Specification
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: Assumptions

SECMP178-A1	The error code E080801, which is being removed from DUGIDS, will remain in the DUIS schema.
SECMP178-A2	System Regression testing for both SIT and UIT will be covered by the future post-PIT CR for the June 2024 SEC System Release (subject to agreement between the Parties).
SECMP178-A3	There will be no integration testing of the solution in the SIT environments on the basis that these would be a repeat of the testing carried out in PIT, which would not offer value for money for DCC.
SECMP178-A4	There will be no integration testing of the solution in the UIT environments on the basis that these would be a repeat of the testing carried out in PIT, which would not offer value for money for DCC.