SEC
Smart Energy Code

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DP267

‘Facilitating the installation and commissioning of meters triaged under Use Case 004’

Modification Report

Version 0.1

13 February 2024

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About this document

This document is a draft Modification Report. It currently sets out the background, issue, 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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1. Summary

This proposal has been raised by Jeff Studholme from Smart Meter Assets.

This modification proposal aims to address Smart Meters under Use Case 004, specifically focusing on reinstalling Smart Meters returned for reuse.

Meters can be removed from premises and undergo triage activities if no fault is identified. The Security Sub-Committee (SSC) has produced and published 'SSC Guidance for Device Refurbishment & Security Controls' which details requirements for Use Cases 001 (HAN Reset via a Port), 002 (Identifying Installed SMKI Certificates), 003 (HAN Reset via the Device User Interface) and 004 (Factory Reset).

Some Manufacturers have confirmed that Devices that undergo a Factory Reset under Use Case 004 will generate new Device Certificates. This will cause the Installation & Commissioning activities to fail as, to facilitate the other Use Cases, the DSP currently remembers the previous Certificates on a Device, which prevents it from being able to communicate.

2. Issue

What are the current arrangements?

What are Triaged Devices?

Triaged Devices are Devices that have experienced a problem in the field and have been returned to the Energy Supplier warehouse, Meter Asset Provider (MAP), or manufacturer to investigate the root cause of the issue. The Devices which are found to have no issues would be returned for re-installation using whichever Use Case is appropriate for that Device. Devices which have no issue but had successfully installed and commissioned into DCC systems, would be refurbished (effectively re-setting the Device). As part of the refurbishment the security credentials on the Device may change.

Currently, there are four Use Cases for triage and refurbishment and are shown below.

- Use Case 001 – Enables a meter to be disassociated from a Home Area Network (HAN). All Certificates are retained in the Device.
- Use Case 002 – Allows the Responsible Supplier to be identified by reference to the Public SMKI Organisation Certificate on the Device. All Certificates are retained in the Device.
- Use Case 003 – Similar to Use Case 001 where disassociating the Smart Meter from the HAN is completed via the Device's User Interface.
- Use Case 004 – This Use Case is a scenario where a Device's credentials may have changed. The Data Service Provider (DSP) systems retain memory of the initial Device credentials meaning if a triaged Device under Use Case 004 were to be installed, it would fail the I&C process.

Triaged Devices under Use Case 004

Use Case 004 addresses situations where smart Devices, after being returned to the MAP or Supplier, are found to have no defects. These Devices will be undergo a Use case 004 compliant

process and be returned to the field for re-installation. Providing the Certificates on the Device have not been changed, these Devices will successfully install and commission into the Data Communications Company (DCC) systems on re-installation.

The manufacturer may exchange the certificates on the Device where the existing Known Remote Party (KRP) Certificates will be reverted to the Access Control Broker (ACB) Certificate. The Device may also regenerate its private and public key, and if that has been done, the signed Device Certificate will be placed on the Device.

If a Device has never been installed before, the DCC will always use the latest pending Device Certificate which is present in the SMKI Repository for communications with the Device. If a Device has been installed, the Device Certificate will be marked as 'in use' and the DCC expects the Device to always use the 'in use' Device Certificate. If, as part of Use Case 004, the Device Certificate has been changed, the DCC will have a new pending Device Certificate in the SMKI Repository. However, the DCC will continue to use the Device Certificate marked as 'in use'.

In summary if a scenario where Device Certificates on a Device have changed as part of Use Case 004, any DCC communications with a Device will fail as the DSP systems retains the previous Device Certificate details on the Device.

What is the issue?

For meters where the Device Certificate details have changed under Use Case 004, an attempt to reinstall the Smart Meter will fail due to the DSP systems remembering the initial set of Certificates, creating a mismatch. The functionality for DSP systems to remember the initial set of Certificates was introduced to support Use Cases 001, 002 and 003 which was believed to be the majority of the cases at time of DSP design.

If a Device is reinstalled, the DCC will attempt to cycle through available ACB Certificates until communication with a Device is possible. This assumes the Device Certificate has not changed and matches the Device Certificate marked as 'in use' in the DCC System (SMKI). Using current DSP processes, this process will take approximately 180 seconds for each ACB Certificate tried and is expected to result in communications with a Device.

If the Device Certificate has been changed as part of Use Case 004 the Device Certificate on the Device no longer matches the Device Certificate marked as 'in use' in the DCC System (SMKI). In this case communications with a Device are not possible. Meaning these Devices cannot be installed and commissioned into the DSP system.

With Use Case 004 compliant firmware available from some manufacturers and Triage facilities gaining approval from the User Competent Independent Organisation (CIO), Devices which have been subject to a Use Case 004 compliant refurbishment may start to become available from as early as Q1 2024.The scale of the issue is expected to increase as any Devices which are subject to Use Case 004 via a solution where Device Certificate regeneration and the replacement of KRP certificates with ACB Certificates has occurred, will not be able to install and commission into DCC systems.

What is the impact this will have?

Higher installation failure rate

When the Device Certificate is not known by the DCC, the installation of a Smart Meter is impossible. This will lead to a high installation failure rate.

When the ACB Certificate is not known by the DCC, the installation of a Smart Meter may be delayed.

Impact on consumers

Delays in installation process

Consumers are impacted negatively by an install if it is delayed or not successful on the first try. It may require multiple installer visits to successfully install a Smart Meter.

Cost to industry

This makes any Use Case 004 compliant refurbishment process which sees Device Credentials changed, futile.

Devices which have been refurbished and have failed to install, may be stored in a warehouse where they will not be utilised, or may be scrapped, both incurring financial costs to industry.

Alternatively, benefits from this Use case will not be realised for any meters which require Device Credentials to change as part of what would be a compliant refurbishment process. Any non-faulty Devices of this kind would therefore be disposed in lieu of being refurbished.

All costs incurred, or benefits not realised, will result in increased costs which are borne by consumers.

3. Assessment of the proposal

Areas for assessment

The Proposer believes there are multiple potential solutions to enable Use Case 004 triaged Devices to be installed and commissioned into DCC systems. These include:

- Developing a solution to pre-notify triaged Devices (this would require a Modification)
- Changes to DCC / DSP processes (this may require a Modification)
- Changes to (some) meter manufacturer processes such that Device credentials do not change as part of the Use Case 004 process (this would not require a Modification)
- Changes to DSP systems to turn off the memory function which was added to support use Case 001-003 (this may require a Modification). In another word, use cases 001-003 should not be used by industry, and an Energy Supplier cannot reinstall a Device in another location without going through use case 004 first.

These options should be considered with input from a wide range of stakeholders. It may be that other solutions are identified. If the issue can be scaled further through identifying what percentage of Devices are manufactured by meter manufacturers with a process which changes Device credentials, a more informed cost benefit analysis can be produced, and the most appropriate change(s) identified.

The Proposer believes that the issue of DSP cycle time for ACB certificate searches should be considered separately.

Which measures will prevent installations to fail and Devices to become stranded following Use Case 004 Device updates?

The DCC must be informed on which Device Certificate to use for communications with the Device. This allows the DCC to mark the Device Certificate used by the Device as 'in use' in the SMKI Repository (or mark the previous 'in use' Device Certificate as "Not in Use". This will enable communications with the Device.

How can the installation time be minimised following Use Case 004?

The DCC must be informed on which ACB Certificate has been installed on a Device. This allows the DCC to select the appropriate ACB Certificate for communications with a Device. This will avoid retries and minimise the installation time.

The DCC should assess options to optimise the cycle time for searching for ACB certificates as this will lead to a sub-optimal installation process for all Devices triaged using Use Case 004.

What is being done now?

If a Device is reinstalled under Use Case 004, the DCC will attempt to cycle through available ACB Certificates until communications with a Device is possible. This only applies where the Device Certificate has not been changed and matches the Device Certificate marked as 'in use' in the DCC System.

For any instance where the Device Certificate has been changed, an incident must be raised to the DCC to manually mark the appropriate Device Certificate as 'in use' (or mark the previous 'in use' Device Certificate as "Not In Use").

What is the scale of the issue?

This modification relates to Smart Metering Equipment Technical Specifications (SMETS1) and SMETS2.

The aggregated scale of the issue will be better determined when data has been gathered to understand the share of the installed Devices which have a solution which changes Device credentials (herein referred to as "Affected Devices"). The write-off cost of each non-faulty removed Device varies according to the age of the Device at removal. The aim is to gather data before / at a Working Group to better inform the decision to progress (or not) the Modification. As stated above, some potential solutions will not require a Modification.

The benefit of having a viable Use Case 004 triage solution is that the meter is not scrapped. The scale of the issue is therefore to be quantified as:

The anticipated number of affected Devices to be removed, excluding those with faults multiplied by the Device cost. The cost of the Device will vary within an estimated range of £35-70 (gas meters generally being more expensive than electricity meters)

Sub-Committee input

The Smart Energy Code Administrator and Secretariat (SECAS) will engage the Chairs from the Operations Group (OPSG), the Technical Architecture and Business Architecture Sub-Committee (TABASC), the Security Sub-Committee (SSC), the Smart Metering Key Infrastructure Policy Management Authority (SMKI PMA) and the Testing Advisory Group (TAG) to confirm what input is required from these forums. SECAS believes the following Sub-Committees will need to provide the following input to this modification:

Sub-Committee input	
Sub-Committee	**Input sought**
OPSG	To evaluate how this modification will impact day-to-day operations within the I&C process
SMKI PMA	No input required
SSC	To review any security risk and vulnerabilities regarding transmission of Certificate information and to assist with scaling of issue through identifying (confidentially) market share of meter manufacturers who have developed Use Case 004 functionality which changes Device credentials
TABASC	To evaluate the technical feasibility of Device and ACB Certificates being obtained before I&C and consider if DSP search for credentials can be improved to reduce time on site
TAG	No input required

Appendix 1: Progression timetable

Timetable	
Event/Action	**Date**
Draft Proposal raised	13 Feb Jan 2024
Presented to CSC for initial comment	20 Feb 2024
Business requirements developed with Proposer and DCC	20 Feb 2024 – 1 Mar 2024
Business requirements workshop	4 Mar 2024
Modification discussed with Working Group	March 2024

Italics denote planned events that could be subject to change

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**
ACB	Access Control Broker
CIO	Competent Independent Organisation
CSC	Change Sub-Committee
DCC	Data Communications Company
DSP	Data Service Provider
HAN	Home Area Network
I&C	Install and Commission
KRP	Known Remote Party
MAP	Meter Asset Provider
OPSG	Operations Group
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SMETS	Smart Metering Equipment Technical Specifications
SMKI	Smart Metering Key Infrastructure
SMKI PMA	Smart Metering Key Infrastructure Policy Management Authority
SSC	Security Sub-Committee
TABASC	Technical Architecture and Business Architecture Sub-Committee
TAG	Testing Advisory Group