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MP284

‘Extension of life to FOC S1SPKI End Entity Certificates’

Modification Report

Version 1.0

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Corporate member of
Plain English Campaign
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About this document

This document is a Modification Report. It sets out the background, issue, solution, impacts, costs, implementation approach and progression timetable for this modification, along with any relevant discussions, views and conclusions.

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This document also has one annex:

- **Annex A** contains the redlined changes to the Smart Energy Code (SEC) required to deliver the Proposed Solution.

Contact

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

Elizabeth Woods

020 4566 8335

elizabeth.woods@gemserv.com

1. Summary

This proposal has been raised by Bradley Baker from the Data Communications Company (DCC).

Currently, the Final Operating Capacity (FOC)¹ Smart Metering Equipment Technical Specifications (SMETS) 1 Service Provider (S1SP) Public Key Infrastructure (PKI) policy and FOC S1SPPKI itself have a number of end entity Certificates that have a lifetime of five years from the point of generation. These Certificates are essential to maintain SMETS1 Device operation and cause Smart DCC a variety of technical and operational challenges every few years to maintain. By extending the life of the end entity Certificates, the DCC would not need to renew Certificates for the remaining lifetime of the FOC SMETS1 Devices.

The Proposed Solution will extend the lifetime of end entity Certificates from five years to 14 years, so they are aligned with the Root Certificate and will negate the need for the DCC to replace these Certificates until the FOC SMETS1 Device's end of life.

This modification will impact the DCC, Suppliers and Other SEC Parties (Meter Asset Providers (MAPs)). There are no DCC System costs, so implementation costs will be limited to the Smart Energy Code Administrator and Secretariat (SECAS) time and effort. This is a Self-Governance Modification and, if approved, will be implemented through an ad hoc SEC Release one Working Day after decision. The proposed changes are required prior to 1 April 2025 to ensure maximum benefits and cost savings to industry.

2. Issue

What are the current arrangements?

What is an end entity certificate?

An end entity certificate is a digital document that authenticates an entity's identity in the digital sphere and is a digitally signed statement issued by a Certificate Authority to a person or system. It validates users, Devices, networks, and services in a PKI, allowing computers to trust each other when performing sensitive operations. It binds a public key to some identifying information and is used for encryption, authentication, digital signatures and other purposes. They are named 'end entity' as they reside at the endpoints of secure connections. The end entity Certificates on Smart Metering Devices can be found in Table 1 below.

What is a FOC S1SPPKI Certificate and what is it used for?

An FOC S1SPPKI Certificate means any public key certificate Issued under the FOC S1SPPKI Certificate Policy by the FOC S1SP Certification Authority (CA) or the Application Service CA, the certificate being an electronic document issued by a FOC S1SPCA that is used to prove the ownership of a Public Key. These ensure the security of smart metering Devices.

¹ FOC is a cohort of SMETS1 Devices from a specific manufacturer that were adopted and enrolled into the DCC Systems.

When do the FOC S1SPPKI Certificates expire?

FOC S1SPPKI Certificates are issued with a validity of five years and if the Certificates expire, the FOC SMETS1 Device can stop operating and is unable to be communicated with via smart methods. Prior to its expiry, the DCC are obligated to replace these certificates in order to ensure the FOC SMETS1 Device doesn't stop operating.

FOC S1SPPKI Certificates only allow for a Certificate lifetime to be counted in whole years, so the DCC have agreed to issue a Certificate with one year less than the Root Certificate to ensure there are no issues with Certificates having a lifetime longer than the Root Certificate.

What is the issue?

The DCC has to run challenging and expensive Certificate swap out exercises with the FOC S1SP every few years to replace expiring end entity Certificates before the expiration date. If the Certificates expire, the FOC SMETS1 Device can stop operating and is unable to be communicated with via smart methods, meaning it is too late to replace the Certificate and the FOC SMETS1 Device will either run in an offline state or need to be replaced in order to reestablish communications with the premise. This can lead to challenges for Suppliers, MAPs and DCC Service Providers (SP) to resolve. New Certificates are only valid for five years, therefore it will be an ongoing challenge for the DCC to regularly replace them before they expire.

SEC Appendix AP2 'FOC S1SPKI Certificate Policy' notes the Certificate validity periods for each Certificate issued, and the ones driving this issue are all with a validity of five years:

Certificate	Validity (Years)
Operator Root CA Certificate	25 years
Intermediate Operator CA Certificate	20 years
Intermediate Enterprise CA Certificate	20 years
End Entity Operator Device Certificate	5 years
End Entity Push Certificate	5 years
End Entity Server Certificate	5 years
Application Service Root CA Certificate	25 years
Intermediate Application Service PKI CA Certificate	20 years
End Entity PKI Role CA Certificate	5 years
End Entity PKI Role RA Certificate	5 years

Table 1: FOC S1SPKI Certificates on Smart Metering Devices

By extending the life of the end entity Certificates, the DCC would not need to renew Certificates for the remaining lifetime of the FOC SMETS1 Devices.

It is also noted that Certificates with an extended life can be replaced at any point in time, just like short life Certificates, to ensure a response to compromise can be achieved.

What is the impact this is having?

There are three key impacts if this issue is not resolved, which are as follows:

- Operational impact 1 – Smart DCC has to open regular Change Requests with the S1SPSP to renew Certificates. These renewal exercises are expensive and time consuming for both

the DCC and their SPs, it costs the DCC a rough order of magnitude (ROM) of £130,000 each time they renew Certificates for the 2.7 million FOC SMETS1 Devices. The DCC has to plan this exercise across the Smart Metering Wide Area Network (SM WAN) and support monitoring of Service Request (SR) performance.

- Operational impact 2 – Smart meters can drop off the DCC network on an intermittent basis and is more likely to happen as firmware and hardware becomes legacy. When this happens, the rotation of Certificates fails and is likely to expire meaning the Communications Hub or Device will not operate, which in turn will need to be replaced at the cost of a new Communications Hub or Device and cost of an engineer visit for installation.
- Subsequent renewals – A FOC SMETS1 Device could remain in a consumers' premises until 2033 and beyond, meaning at least two or three more renewal exercises would be required by the DCC. However, it is anticipated that this total number of FOC SMETS1 Devices impacted will reduce as 4G Communications Hub roll out ramps up.

Impact on consumers

This modification will not have a direct impact on consumers.

3. Solution

Proposed Solution

The Proposed Solution will extend the lifetime of end of entity Certificates from 5 years to 14 years, so they are aligned with the Root Certificate and will negate the need for the DCC to replace these Certificates.

SMETS1 Devices will reach end of life by 2038 or when 2G/3G sunsetting ends (anticipated to be 2033), therefore by extending the life of the end entity Certificates to 14 years, the DCC will update the Certificate life to 14 years during the renewal in 2025 and then would not need to renew Certificates for the remaining lifetime of the FOC SMETS1 Device.

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

Breakdown of Other SEC Party types impacted			
	Shared Resource Providers		Meter Installers
	Device Manufacturers		Flexibility Providers
	DCC Other Users	✓	MAPs/ MAMs

The DCC will be positively impacted by this change as they won't need to renew any FOC S1SPKI Certificates for FOC SMETS1 Devices until the Devices require replacement due to reaching their end of life.

Suppliers and MAPs will be positively impacted as the risk of their FOC SMETS1 Devices going offline or becoming uncommunicable will be eliminated, which would reduce the likelihood of additional inconvenience for their consumers through site visits to replace their Devices.

DCC Systems

DCC System changes

This modification will not impact the DCC System.

DCC System traffic

This modification will not impact DCC System traffic.

SEC and subsidiary documents

The following parts of the SEC will be impacted:

- Appendix AP2 'FOC S1SPKI Certificate Policy'

The changes to the SEC required to deliver the Proposed Solution can be found in Annex A.

Devices

There is no impact to Device behaviour.

Consumers

Consumers could be positively impacted as the solution will mitigate a risk of their FOC SMETS1 Device going offline and needing a replacement.

Other industry Codes

No other industry Codes are impacted by this proposal.

Greenhouse gas emissions

This modification does not impact greenhouse gas emissions.

5. Costs

DCC costs

There are no DCC costs to implement this modification.

SECAS costs

The estimated SECAS implementation cost to implement this as a stand-alone modification is one days of effort, amounting to approximately £600. This cost will be reassessed when combining this modification in a scheduled SEC Release. The activities needed to be undertaken for this are:

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

SEC Party costs

There are no SEC Party costs associated with this modification. No concerns were raised at the SEC Issues Group.

6. Implementation approach

Approved implementation approach

The Change Sub-Committee (CSC) approved an implementation date of:

- **Ad-hoc SEC Release** (one Working Day after decision)

The proposed changes are required prior to 1 April 2025 to ensure maximum benefits and cost savings to industry as the current set of FOC S1SPPKI Certificates will start to expire on 31 March 2025 and require renewal. A decision on this modification cannot be made in time to include it in the February 2025 SEC Release and this modification needs to be implemented before the next scheduled SEC Release in June 2025.

7. Assessment of the proposal

Areas for assessment

Sub-Committee input

SECAS has engaged with the Chairs from the Operations Group (OPSG), the Privacy Sub-Committee (PSC), 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 provided
OPSG	None
PSC	None
SMKI PMA	No objections to the solution
SSC	No objections to the solution
TABASC	None
TAG	None

Solution development

The Proposed Solution has been developed with input from the DCC, the SMKI PMA and the SSC.

Discussions at CSC

The DCC noted that this modification impacts 2.7 million FOC SMETS1 Devices and costs the DCC a ROM of £130,000 to rotate Certificates for this estate. They added that this modification will save the DCC from doing at least two further rotations in the future, therefore having an estimated total saving of £260,000.

The CSC queried why there was a rush on the timetable and if the DCC could have raised the modification earlier. The DCC noted this issue was discussed with SSC and SMKI PMA last year, it has taken the DCC a few months to mobilise before raising the modification.

8. Case for change

Business case

There will be a high ROM cost of £130,000 to renew the 2.7 million Devices associated with FOC S1SPPKI Certificate renewal every four years for the remaining lifetime of FOC SMETS1 Devices on the wall. Given 2G/3G sunsetting is currently set for 2033, at least two more renewals could be

required before FOC SMETS1 Devices will have to be replaced by SMETS2+ in order to be compatible with 4G Communication Hubs, therefore a potential saving of around £260,000.

Views against the General SEC Objectives

Proposer's views

The Proposer believes this modification better facilitates SEC Objective (a)² as it will ensure FOC SMETS1 Devices on existing FOC S1SPKKI Certificates will still be able to be communicable until their end of life without unnecessary added expense, potential for loss of communication and without compromising security.

Views against the consumer areas

Improved safety and reliability

This modification will have a positive impact against this consumer benefit area, as it will ensure more reliability as it will prevent FOC SMETS1 Devices from stopping communications suddenly.

Lower bills than would otherwise be the case

This modification will have an indirect positive impact against this consumer benefit area, as it will save costs by retaining working FOC SMETS1 Devices for longer; prevent the need for early replacements and reduced costs of an engineer visit for installation.

Reduced environmental damage

If implemented, this modification will have a positive impact against this consumer area as it will help prevent the removal of non-communicating Devices.

Improved quality of service

There will be no impact from this modification in this consumer area.

Benefits for society as a whole

This modification will have a positive impact against this consumer benefit area, as it will make the Smart Metering System run more efficiently.

² Facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain

Appendix 1: Progression timetable

Timetable	
Event/Action	Date
Draft Proposal raised	11 Feb 2025
Presented to CSC for initial comment	18 Feb 2025
CSC converts Draft Proposal to Modification Proposal	18 Feb 2025
Modification Report approved by CSC	18 Feb 2025
Modification Report Consultation	19 Feb 2025 – 12 Mar 2025
Change Board Vote	26 Mar 2025

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
CA	Certification Authority
CSC	Change Sub-Committee
DCC	Data Communications Company
FOC	Final Operating Capacity
FOC S1SPCA	Final Operating Capacity SMETS1 Service Provider Certification Authority
FOC S1SPPKI	Final Operating Capacity SMETS1 Service Provider Public Key Infrastructure
MAP	Meter Asset Providers
OPSG	Operations Group
PKI	Public Key Infrastructure
PSC	Privacy Sub-Committee
ROM	Rough order of magnitude
S1SP	SMETS1 Service Provider
S1SPKI	SMETS1 Service Public Key Infrastructure
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SP	Service Provider
SR	Service Request
SM WAN	Smart Metering Wide Area Network
SMETS	Smart Metering Equipment Technical Specifications
SMKI PMA	Smart Metering Key Infrastructure Policy Management Authority
SSC	Security Sub-Committee

Glossary	
Acronym	Full term
TABASC	Technical Architecture and Business Architecture Sub-Committee
TAG	Testing Advisory Group