



Certification Practice Statement

Siemens Root CAs

Document History

Version	Date	Author	Change Comment
1.0	June 10, 2016	Alexander Winnen, Michael Munzert	First final version
1.1	December 1, 2016	Rufus Buschart	Minor updated version
1.2	May 29, 2017	Rufus Buschart	Update new CA hierarchy
1.3	January 12, 2018	Rufus Buschart	Chapter „Document History“ Added changed after ballots Chapter 4.9.1 Revocation reasons added Chapter 4.9.2 Who can request a revocation added Chapter 5 Moved to CP
1.4	February 7, 2018	Rufus Buschart	Chapter 4.9.7 Issuing of CARL added Chapter 6.1.5 Reference to ETSI TS 119 312 added Chapter 6.2.7 Details about backup devices Chapter 7.2 / 7.3 Technical specification added
1.5	February 23, 2018	Rufus Buschart	Licensing changed to CC-BY SA 4.0 as required by Mozilla

This document will be reviewed every year or in the event of an important ad-hoc change according to the Information Security update process for documents. Changes to the CA/B Baseline Requirements will be reflected after passing of the respective ballot into this document. Each new version will be approved by the respective management level before being released.

This document is published under www.siemens.com/pki.

Scope and Applicability

This document constitutes the Certificate Practice Statement (CPS) for the Siemens Root Certificates (Root CA). The purpose of this document is to publicly disclose to subscribers and relying parties the business policies and practices under which this Root CA is operated.

Document Status

This document with version 1.5 and status Released has been classified as “Unrestricted” and is licensed as CC BY-SA 4.0.

	Name	Department	Date
Author	Various authors, detailed information in document history		
Checked by	Tobias Lange Florian Grotz	Siemens LS Siemens GS IT HR 7 4	June 10, 2016 February 23, 2018
Authorization	Markus Wichmann	Siemens GS IT ISEC	February 23, 2018

This CPS has been approved by the responsible Siemens information security officer on February 23, 2018.

Table of Content

SCOPE AND APPLICABILITY	2
DOCUMENT STATUS	2
1 INTRODUCTION	7
1.1 OVERVIEW	7
1.2 DOCUMENT NAME AND IDENTIFICATION.....	7
1.3 PKI PARTICIPANTS.....	8
1.3.1 <i>Certification Authorities</i>	8
1.3.2 <i>Registration Authorities</i>	8
1.3.3 <i>Subscribers</i>	8
1.3.4 <i>Relying Parties</i>	8
1.3.5 <i>Other participants</i>	8
1.4 CERTIFICATE USAGE.....	8
1.4.1 <i>Appropriate Certificate Usage</i>	8
1.4.2 <i>Prohibited Certificate Usage</i>	8
1.5 POLICY ADMINISTRATION.....	8
1.5.1 <i>Organization Administering the Document</i>	8
1.5.2 <i>Contact Person</i>	8
2 PUBLICATION AND REPOSITORY RESPONSIBILITIES	9
2.1 REPOSITORIES.....	9
2.2 PUBLICATION OF CERTIFICATION INFORMATION	9
2.3 TIME OR FREQUENCY OF PUBLICATION	9
2.4 ACCESS CONTROLS ON REPOSITORIES.....	9
3 IDENTIFICATION AND AUTHENTICATION	10
3.1 NAMING.....	10
3.1.1 <i>Types of Names</i>	10
3.1.2 <i>Need of Names to be Meaningful</i>	10
3.1.3 <i>Anonymity or Pseudonymity of Subscribers</i>	10
3.1.4 <i>Rules for Interpreting Various Name Forms</i>	10
3.1.5 <i>Uniqueness of Names</i>	10
3.1.6 <i>Recognition, Authentication, and Roles of Trademarks</i>	10
3.2 INITIAL IDENTITY VALIDATION	10
3.2.1 <i>Method to Prove Possession of Private Key</i>	10
3.2.2 <i>Identification and Authentication of Organization Identity</i>	10
3.2.3 <i>Identification and Authentication of Individual Identity</i>	10
3.2.4 <i>Non-verified Subscriber Information</i>	10
3.2.5 <i>Validation of Authority</i>	10
3.2.6 <i>Criteria for Interoperation between Communities of Trusts</i>	10
3.3 IDENTIFICATION AND AUTHENTICATION FOR RE-KEY REQUESTS	10
3.4 IDENTIFICATION AND AUTHENTICATION FOR REVOCATION REQUESTS	10
4 CERTIFICATE LIFECYCLE OPERATIONAL REQUIREMENTS	11
4.1 CERTIFICATE APPLICATION	11
4.1.1 <i>Who can submit a certificate application?</i>	11
4.1.2 <i>Enrollment Process and Responsibilities</i>	11
4.2 CERTIFICATE APPLICATION PROCESSING	11
4.2.1 <i>Performing identification and authentication functions</i>	11
4.2.2 <i>Approval or Rejection of Certificate Applications</i>	11
4.2.3 <i>Time to Process Certificate Applications</i>	11
4.3 CERTIFICATE ISSUANCE	11
4.3.1 <i>Root CA actions during Certificate issuance</i>	11

4.3.2	<i>Notification to Subscriber by the CA of Certificate issuance</i>	11
4.4	CERTIFICATE ACCEPTANCE	11
4.4.1	<i>Conduct constituting Certificate acceptance</i>	11
4.4.2	<i>Publication of the Certificate by the CA</i>	11
4.4.3	<i>Notification of Certificate issuance by the CA to other entities</i>	11
4.5	KEY PAIR AND CERTIFICATE USAGE	11
4.5.1	<i>Subject Private Key and Certificate Usage</i>	11
4.5.2	<i>Relying Party Public Key and Certificate Usage</i>	11
4.6	CERTIFICATE RENEWAL	11
4.6.1	<i>Circumstance for Certificate Renewal</i>	12
4.6.2	<i>Who may request renewal?</i>	12
4.6.3	<i>Processing Certificate Renewal Request</i>	12
4.6.4	<i>Notification of new Certificate Issuance to Subject</i>	12
4.6.5	<i>Conduct Constituting Acceptance of a Renewal Certificate</i>	12
4.6.6	<i>Publication of the Renewal Certificate by the CA</i>	12
4.6.7	<i>Notification of Certificate Issuance by the CA to the Entities</i>	12
4.7	CERTIFICATE RE-KEY	12
4.7.1	<i>Circumstances for Certificate Re-key</i>	12
4.7.2	<i>Who may request certification of a new Public Key?</i>	12
4.7.3	<i>Processing Certificate Re-keying Requests</i>	12
4.7.4	<i>Notification of new Certificate Issuance to Subscriber</i>	12
4.7.5	<i>Conduct Constituting Acceptance of a Re-keyed Certificate</i>	12
4.7.6	<i>Publication of the Re-keyed Certificate by the CA</i>	12
4.7.7	<i>Notification of Certificate Issuance by the CA to other Entities</i>	12
4.8	CERTIFICATE MODIFICATION	12
4.8.1	<i>Circumstance for Certificate Modification</i>	12
4.8.2	<i>Who may request Certificate modification?</i>	12
4.8.3	<i>Processing Certificate Modification Requests</i>	12
4.8.4	<i>Notification of new Certificate Issuance to Subject</i>	13
4.8.5	<i>Conduct Constituting Acceptance of Modified Certificate</i>	13
4.8.6	<i>Publication of the Modified Certificate by the CA</i>	13
4.8.7	<i>Notification of Certificate Issuance by the CA to Other Entities</i>	13
4.9	CERTIFICATE REVOCATION AND SUSPENSION	13
4.9.1	<i>Circumstances for Revocation</i>	13
4.9.2	<i>Who can request revocation?</i>	13
4.9.3	<i>Procedure for Revocation Request</i>	13
4.9.4	<i>Revocation Request Grace Period</i>	13
4.9.5	<i>Time within which CA must Process the Revocation Request</i>	13
4.9.6	<i>Revocation Checking Requirement for Relying Parties</i>	13
4.9.7	<i>CRL Issuance Frequency</i>	13
4.9.8	<i>Maximum Latency for CRLs</i>	13
4.9.9	<i>On-line Revocation/Status Checking Availability</i>	13
4.9.10	<i>Other Forms of Revocation Advertisements Available</i>	13
4.9.11	<i>Special Requirements for Private Key Compromise</i>	14
4.9.12	<i>Circumstances for Suspension</i>	14
4.10	CERTIFICATE STATUS SERVICES	14
4.10.1	<i>Operational Characteristics</i>	14
4.10.2	<i>Service Availability</i>	14
4.10.3	<i>Optional Features</i>	14
4.11	END OF SUBSCRIPTION	14
4.12	KEY ESCROW AND RECOVERY	14
5	MANAGEMENT, OPERATIONAL, AND PHYSICAL CONTROLS	15
5.1	PHYSICAL SECURITY CONTROLS	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.1.1	<i>Site Location and Construction</i>	Fehler! Textmarke nicht definiert.
5.1.2	<i>Physical Access</i>	Fehler! Textmarke nicht definiert.
5.1.3	<i>Power and Air Conditioning</i>	Fehler! Textmarke nicht definiert.

5.1.4	Water Exposure.....	Fehler! Textmarke nicht definiert.
5.1.5	Fire Prevention and Protection	Fehler! Textmarke nicht definiert.
5.1.6	Media Storage.....	Fehler! Textmarke nicht definiert.
5.1.7	Waste Disposal.....	Fehler! Textmarke nicht definiert.
5.1.8	Off-site Backup.....	Fehler! Textmarke nicht definiert.
5.2	PROCEDURAL CONTROLS	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.2.1	Trusted Roles.....	Fehler! Textmarke nicht definiert.
5.2.2	Numbers of Persons Required per Task	Fehler! Textmarke nicht definiert.
5.2.3	Identification and Authentication for each Role	Fehler! Textmarke nicht definiert.
5.2.4	Roles Requiring Separation of Duties.....	Fehler! Textmarke nicht definiert.
5.3	PERSONNEL SECURITY CONTROLS	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.3.1	Qualifications, Experience and Clearance Requirements.....	Fehler! Textmarke nicht definiert.
5.3.2	Background Check Procedures.....	Fehler! Textmarke nicht definiert.
5.3.3	Training Requirements.....	Fehler! Textmarke nicht definiert.
5.3.4	Retraining Frequency and Requirements.....	Fehler! Textmarke nicht definiert.
5.3.5	Job Rotation Frequency and Sequence.....	Fehler! Textmarke nicht definiert.
5.3.6	Sanctions for Unauthorized Actions.....	Fehler! Textmarke nicht definiert.
5.3.7	Independent Contractor Requirements.....	Fehler! Textmarke nicht definiert.
5.3.8	Documents Supplied to Personnel.....	Fehler! Textmarke nicht definiert.
5.4	AUDIT LOGGING PROCEDURES	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.4.1	Types of Events Recorded.....	Fehler! Textmarke nicht definiert.
5.4.2	Frequency of Processing Audit Logging Information	Fehler! Textmarke nicht definiert.
5.4.3	Retention Period for Audit Logging Information.....	Fehler! Textmarke nicht definiert.
5.4.4	Protection of Audit Logs.....	Fehler! Textmarke nicht definiert.
5.4.5	Backup Procedures for Audit Logging Information	Fehler! Textmarke nicht definiert.
5.4.6	Collection System for Monitoring Information (internal or external)	Fehler! Textmarke nicht definiert.
5.4.7	Notification to Event-causing Subject.....	Fehler! Textmarke nicht definiert.
5.4.8	Vulnerability Assessments.....	Fehler! Textmarke nicht definiert.
5.5	RECORDS ARCHIVAL.....	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.5.1	Types of Records Archived	Fehler! Textmarke nicht definiert.
5.5.2	Retention Period for Archived Audit Logging Information.....	Fehler! Textmarke nicht definiert.
5.5.3	Protection of Archived Audit Logging Information	Fehler! Textmarke nicht definiert.
5.5.4	Archive Backup Procedures.....	Fehler! Textmarke nicht definiert.
5.5.5	Requirements for Time-Stamping of Record.....	Fehler! Textmarke nicht definiert.
5.5.6	Archive Collection System (internal or external)	Fehler! Textmarke nicht definiert.
5.5.7	Procedures to Obtain and Verify Archived Information	Fehler! Textmarke nicht definiert.
5.6	KEY CHANGEOVER	17
5.7	COMPROMISE AND DISASTER RECOVERY.....	FEHLER! TEXTMARKE NICHT DEFINIERT.
5.7.1	Incident and Compromise Handling Procedures.....	Fehler! Textmarke nicht definiert.
5.7.2	Corruption of Computing Resources, Software, and/or Data	Fehler! Textmarke nicht definiert.
5.7.3	Entity Private Key Compromise Procedures.....	Fehler! Textmarke nicht definiert.
5.7.4	Business Continuity Capabilities After a Disaster.....	Fehler! Textmarke nicht definiert.
5.8	CA TERMINATION	FEHLER! TEXTMARKE NICHT DEFINIERT.
6	TECHNICAL SECURITY CONTROLS	19
6.1	KEY PAIR GENERATION AND INSTALLATION.....	19
6.1.1	Key Pair Generation	19
6.1.2	Private Key Delivery to Subject.....	19
6.1.3	Public Key Delivery to Certificate Issuer	19
6.1.4	CA Public Key delivery Relying Parties.....	19
6.1.5	Key Sizes.....	19
6.1.6	Public Key Parameters Generation and Quality Checking.....	19
6.1.7	Key Usage Purposes	19
6.2	PRIVATE KEY PROTECTION AND CRYPTOGRAPHIC MODULE ENGINEERING CONTROLS	19
6.2.1	Cryptographic Module Standards and Controls.....	19
6.2.2	Private Key (n out of m) Multi-person Control	19
6.2.3	Private Key Escrow.....	19

6.2.4	<i>Private Key Backup</i>	20
6.2.5	<i>Private Key Archival</i>	20
6.2.6	<i>Private Key Transfer into or from a Cryptographic Module</i>	20
6.2.7	<i>Storage of Private Keys on the Cryptographic Module</i>	20
6.2.8	<i>Method of Activating Private Key</i>	20
6.2.9	<i>Method of Deactivating Private Key</i>	20
6.2.10	<i>Method of Destroying Private Key</i>	20
6.2.11	<i>Cryptographic Module Rating</i>	20
6.3	OTHER ASPECTS OF KEY PAIR MANAGEMENT	20
6.3.1	<i>Public Key Archival</i>	20
6.3.2	<i>Certificate Operational Periods and Key Pair Usage Periods</i>	20
6.4	ACTIVATION DATA.....	21
6.4.1	<i>Activation Data Generation and Installation</i>	21
6.4.2	<i>Activation Data Protection</i>	21
6.4.3	<i>Other Aspects of Activation Data</i>	21
6.5	COMPUTER SECURITY CONTROLS.....	21
6.6	LIFE CYCLE SECURITY CONTROLS.....	21
6.6.1	<i>System Development Controls</i>	21
6.6.2	<i>Security Management Controls</i>	21
6.6.3	<i>Life Cycle of Security Controls</i>	21
6.7	NETWORK SECURITY CONTROLS	21
6.8	TIME STAMP PROCESS.....	21
7	CERTIFICATE, CRL, AND OCSP PROFILES	21
7.1	CERTIFICATE PROFILE	21
7.2	CRL PROFILE	21
7.3	OCSP PROFILE	22
8	COMPLIANCE AUDIT AND OTHER ASSESSMENT	22
9	OTHER BUSINESS AND LEGAL MATTERS	23
10	REFERENCES	24
	ANNEX A: ACRONYMS AND DEFINITIONS	25
A.1	DEFINITIONS.....	25
A.2	ABBREVIATIONS.....	25

1 Introduction

This document has been structured according to RFC 3647 "Internet X.509 Public Key Infrastructure: Certificate Policy and Certification Practices Framework" (Nov 2003) [RFC3647].

1.1 Overview

This Certification Practice Statement (CPS) defines

- measures and procedures in the context of the Certification Services performed by the Siemens Root CA
- minimum requirements demanded from all PKI participants

The CPS details the procedures and controls in place to meet the CP requirements. For identical topics the respective chapter in the CP is referenced.

The following picture shows the Siemens Root CAs together with the respective Issuing CAs:

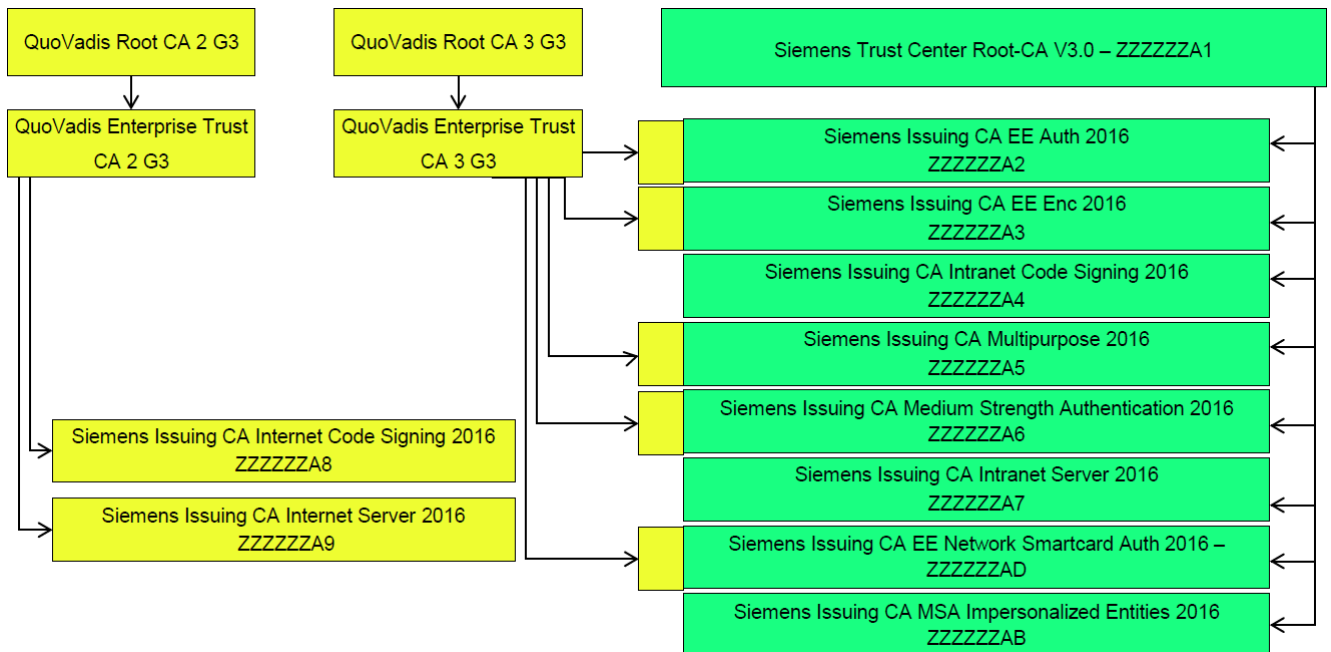


Figure 1: Siemens PKI hierarchy

The following table lists the currently operated Root CAs as well as their implemented requirements according to [ETSI 102 042]:

CA	Requirements		
	NCP+	OVCP	DVCP
ZZZZZV0 Siemens Internet CA V1.0	X	-	-
ZZZZZV1 Siemens Trust Center Root-CA V2.0	X	-	-
ZZZZZA1 Siemens Trust Center Root-CA V3.0	X	-	-

Table 1: Root CA Implementation of ETSI requirements

1.2 Document Name and Identification

This CPS is referred to as the 'Certification Practice Statement'.

Title: Certification Practice Statement of Siemens Root CAs

OID: 1.3.6.1.4.1.4329.99.2.1.1.5.0

Expiration: This version of the document is the most current one until a subsequent release is published.

1.3 PKI Participants

PKI Participants are Siemens Certification Authorities, Registration Authorities, Subjects, and Relying Parties.

1.3.1 Certification Authorities

Specified in the Certificate Policy.

1.3.2 Registration Authorities

Specified in the Certificate Policy.

1.3.3 Subscribers

Specified in the Certificate Policy.

1.3.4 Relying Parties

Specified in the Certificate Policy.

1.3.5 Other participants

Specified in the Certificate Policy.

1.4 Certificate Usage

1.4.1 Appropriate Certificate Usage

Specified in the Certificate Policy.

1.4.2 Prohibited Certificate Usage

Specified in the Certificate Policy.

1.5 Policy Administration

1.5.1 Organization Administering the Document

Specified in the Certificate Policy.

1.5.2 Contact Person

Specified in the Certificate Policy.

2 Publication and Repository Responsibilities

2.1 Repositories

Specified in the Certificate Policy.

2.2 Publication of Certification Information

Specified in the Certificate Policy.

2.3 Time or Frequency of Publication

Specified in the Certificate Policy.

2.4 Access Controls on Repositories

Specified in the Certificate Policy.

3 Identification and Authentication

3.1 Naming

3.1.1 Types of Names

Specified in the Certificate Policy.

3.1.2 Need of Names to be Meaningful

Specified in the Certificate Policy.

3.1.3 Anonymity or Pseudonymity of Subscribers

Specified in the Certificate Policy.

3.1.4 Rules for Interpreting Various Name Forms

Specified in the Certificate Policy.

3.1.5 Uniqueness of Names

Specified in the Certificate Policy.

3.1.6 Recognition, Authentication, and Roles of Trademarks

Specified in the Certificate Policy.

3.2 Initial Identity Validation

3.2.1 Method to Prove Possession of Private Key

Specified in the Certificate Policy.

3.2.2 Identification and Authentication of Organization Identity

Specified in the Certificate Policy.

3.2.3 Identification and Authentication of Individual Identity

Specified in the Certificate Policy.

3.2.4 Non-verified Subscriber Information

Specified in the Certificate Policy.

3.2.5 Validation of Authority

Specified in the Certificate Policy.

3.2.6 Criteria for Interoperation between Communities of Trusts

Specified in the Certificate Policy.

3.3 Identification and Authentication for Re-key Requests

Specified in the Certificate Policy.

3.4 Identification and Authentication for Revocation Requests

Specified in the Certificate Policy.

4 Certificate Lifecycle Operational Requirements

4.1 Certificate Application

4.1.1 Who can submit a certificate application?

Specified in the Certificate Policy.

4.1.2 Enrollment Process and Responsibilities

Specified in the Certificate Policy.

4.2 Certificate Application Processing

4.2.1 Performing identification and authentication functions

Specified in the Certificate Policy.

4.2.2 Approval or Rejection of Certificate Applications

Specified in the Certificate Policy.

4.2.3 Time to Process Certificate Applications

Specified in the Certificate Policy.

4.3 Certificate Issuance

4.3.1 Root CA actions during Certificate issuance

Specified in the Certificate Policy.

4.3.2 Notification to Subscriber by the CA of Certificate issuance

Specified in the Certificate Policy.

4.4 Certificate Acceptance

4.4.1 Conduct constituting Certificate acceptance

Specified in the Certificate Policy.

4.4.2 Publication of the Certificate by the CA

Specified in the Certificate Policy.

4.4.3 Notification of Certificate issuance by the CA to other entities

Specified in the Certificate Policy.

4.5 Key Pair and Certificate Usage

4.5.1 Subject Private Key and Certificate Usage

Specified in the Certificate Policy.

4.5.2 Relying Party Public Key and Certificate Usage

Specified in the Certificate Policy.

4.6 Certificate Renewal

Specified in the Certificate Policy.

4.6.1 Circumstance for Certificate Renewal

Specified in the Certificate Policy.

4.6.2 Who may request renewal?

Specified in the Certificate Policy.

4.6.3 Processing Certificate Renewal Request

Specified in the Certificate Policy.

4.6.4 Notification of new Certificate Issuance to Subject

Specified in the Certificate Policy.

4.6.5 Conduct Constituting Acceptance of a Renewal Certificate

Specified in the Certificate Policy.

4.6.6 Publication of the Renewal Certificate by the CA

Specified in the Certificate Policy.

4.6.7 Notification of Certificate Issuance by the CA to the Entities

Specified in the Certificate Policy.

4.7 Certificate Re-key

Specified in the Certificate Policy.

4.7.1 Circumstances for Certificate Re-key

Specified in the Certificate Policy.

4.7.2 Who may request certification of a new Public Key?

Specified in the Certificate Policy.

4.7.3 Processing Certificate Re-keying Requests

Specified in the Certificate Policy.

4.7.4 Notification of new Certificate Issuance to Subscriber

Specified in the Certificate Policy.

4.7.5 Conduct Constituting Acceptance of a Re-keyed Certificate

Specified in the Certificate Policy.

4.7.6 Publication of the Re-keyed Certificate by the CA

Specified in the Certificate Policy.

4.7.7 Notification of Certificate Issuance by the CA to other Entities

Specified in the Certificate Policy.

4.8 Certificate Modification

4.8.1 Circumstance for Certificate Modification

Specified in the Certificate Policy.

4.8.2 Who may request Certificate modification?

Specified in the Certificate Policy.

4.8.3 Processing Certificate Modification Requests

Specified in the Certificate Policy.

4.8.4 Notification of new Certificate Issuance to Subject

Specified in the Certificate Policy.

4.8.5 Conduct Constituting Acceptance of Modified Certificate

Specified in the Certificate Policy.

4.8.6 Publication of the Modified Certificate by the CA

Specified in the Certificate Policy.

4.8.7 Notification of Certificate Issuance by the CA to Other Entities

Specified in the Certificate Policy.

4.9 Certificate Revocation and Suspension

4.9.1 Circumstances for Revocation

Siemens CA shall revoke without delay a Issuing CA Certificate in the following circumstances:

- the Private Key corresponding to the Public Key in the Certificate has been lost, disclosed without authorization, stolen or compromised in any way
- the Certification Service of a CA is discontinued
- the Policy Management Authority discontinues the certification service for yet unknown higher reasons

4.9.2 Who can request revocation?

The revocation of Issuing CA Certificates may be requested by the PMA.

4.9.3 Procedure for Revocation Request

Specified in the Certificate Policy.

4.9.4 Revocation Request Grace Period

Specified in the Certificate Policy.

4.9.5 Time within which CA must Process the Revocation Request

Specified in the Certificate Policy.

4.9.6 Revocation Checking Requirement for Relying Parties

Specified in the Certificate Policy.

4.9.7 CRL Issuance Frequency

After an issuing CA certificate has been revoked a new CARL shall be generated.

4.9.8 Maximum Latency for CRLs

Specified in the Certificate Policy.

4.9.9 On-line Revocation/Status Checking Availability

Specified in the Certificate Policy.

4.9.10 Other Forms of Revocation Advertisements Available

Specified in the Certificate Policy.

4.9.11 Special Requirements for Private Key Compromise

Specified in the Certificate Policy.

4.9.12 Circumstances for Suspension

Specified in the Certificate Policy.

4.10 Certificate Status Services

4.10.1 Operational Characteristics

Specified in the Certificate Policy.

4.10.2 Service Availability

Specified in the Certificate Policy.

4.10.3 Optional Features

Specified in the Certificate Policy.

4.11 End of Subscription

Specified in the Certificate Policy.

4.12 Key Escrow and Recovery

Specified in the Certificate Policy.

5 Management, Operational, and Physical Controls

Specified in the Root CA CPS.

5.1 Physical Security Controls

5.1.1 Site Location and Construction

Specified in the Certificate Policy.

5.1.2 Physical Access

Specified in the Certificate Policy.

5.1.3 Power and Air Conditioning

Specified in the Certificate Policy.

5.1.4 Water Exposure

Specified in the Certificate Policy.

5.1.5 Fire Prevention and Protection

Specified in the Certificate Policy.

5.1.6 Media Storage

Specified in the Certificate Policy.

5.1.7 Waste Disposal

Specified in the Certificate Policy.

5.1.8 Off-site Backup

Specified in the Certificate Policy.

5.2 Procedural Controls

5.2.1 Trusted Roles

Specified in the Certificate Policy.

5.2.2 Numbers of Persons Required per Task

Specified in the Certificate Policy.

5.2.3 Identification and Authentication for each Role

Specified in the Certificate Policy.

5.2.4 Roles Requiring Separation of Duties

Specified in the Certificate Policy.

5.3 Personnel Security Controls

5.3.1 Qualifications, Experience and Clearance Requirements

Specified in the Certificate Policy.

5.3.2 Background Check Procedures

Specified in the Certificate Policy.

5.3.3 Training Requirements

Specified in the Certificate Policy.

5.3.4 Retraining Frequency and Requirements

Specified in the Certificate Policy.

5.3.5 Job Rotation Frequency and Sequence

Specified in the Certificate Policy.

5.3.6 Sanctions for Unauthorized Actions

Specified in the Certificate Policy.

5.3.7 Independent Contractor Requirements

Specified in the Certificate Policy.

5.3.8 Documents Supplied to Personnel

Specified in the Certificate Policy.

5.4 Audit Logging Procedures

Specified in the Certificate Policy.

5.4.1 Types of Events Recorded

Specified in the Certificate Policy.

5.4.2 Frequency of Processing Audit Logging Information

Specified in the Certificate Policy.

5.4.3 Retention Period for Audit Logging Information

Specified in the Certificate Policy.

5.4.4 Protection of Audit Logs

Specified in the Certificate Policy.

5.4.5 Backup Procedures for Audit Logging Information

Specified in the Certificate Policy.

5.4.6 Collection System for Monitoring Information (internal or external)

Specified in the Certificate Policy.

5.4.7 Notification to Event-causing Subject

Specified in the Certificate Policy.

5.4.8 Vulnerability Assessments

Specified in the Certificate Policy.

5.5 Records Archival

5.5.1 Types of Records Archived

Specified in the Certificate Policy.

5.5.2 Retention Period for Archived Audit Logging Information

Specified in the Certificate Policy.

5.5.3 Protection of Archived Audit Logging Information

Specified in the Certificate Policy.

5.5.4 Archive Backup Procedures

Specified in the Certificate Policy.

5.5.5 Requirements for Time-Stamping of Record

Specified in the Certificate Policy.

5.5.6 Archive Collection System (internal or external)

Specified in the Certificate Policy.

5.5.7 Procedures to Obtain and Verify Archived Information

Specified in the Certificate Policy.

5.6 Key Changeover

Keys expire at the same time as their associated Certificates. Key Changeover must occur before the expiration of its Certificates (stop issuance date) and shall be performed manually.

CA	Validity period	Operational period (Stop Issuance Date)
Siemens Root CAs	12 years	6 years

At "Stop Issuance Date" Siemens CA stops issuing Certificates with old key and initiate generation of new keys. The new Certificate of the new Public Key is published. Certificate Requests received after the "Stop Issuance Date," will be signed with the new CA Private Key.

5.7 Compromise and Disaster Recovery

5.7.1 Incident and Compromise Handling Procedures

Specified in the Certificate Policy.

5.7.2 Corruption of Computing Resources, Software, and/or Data

Specified in the Certificate Policy.

5.7.3 Entity Private Key Compromise Procedures

Specified in the Certificate Policy.

5.7.4 Business Continuity Capabilities After a Disaster

Specified in the Certificate Policy.

5.8 CA Termination

Specified in the Certificate Policy.

6 Technical Security Controls

Technical security controls are defined in accordance with [ETSI-TS 102042].

The technical security controls address:

- ❑ the security measures taken by the Siemens CA to protect its Root Key Pairs and Activation Data (e.g. passwords)
- ❑ other technical security controls used to perform securely the functions listed in CP § 1.1, including technical controls such as life-cycle security controls (e.g., software development environment security, trusted software development methodology) and operational security controls.

6.1 Key Pair Generation and Installation

6.1.1 Key Pair Generation

The Key Pairs of the Root CAs and Issuing CAs are generated with a hardware security module ("HSM"), which is certified in accordance with FIPS 140-2 level 3.

6.1.2 Private Key Delivery to Subject

Not applicable.

6.1.3 Public Key Delivery to Certificate Issuer

Not applicable.

6.1.4 CA Public Key delivery Relying Parties

The Certificates of Siemens CA are distributed to Relying Parties for Certificate path validation purposes. Siemens CAs' Public Keys are published at the Siemens PKI Website.

6.1.5 Key Sizes

The algorithms, parameters and key lengths allowed by Siemens CA are defined in the Certificate Profile document available on www.siemens.com/pki based on the recommendations of ETSI TS 119 312.

6.1.6 Public Key Parameters Generation and Quality Checking

No stipulation.

6.1.7 Key Usage Purposes

"KeyUsage" extension fields of Siemens CA Certificates are specified in accordance RFC 5280 and defined in the Certificate Profile document.

6.2 Private Key Protection and Cryptographic Module Engineering Controls

6.2.1 Cryptographic Module Standards and Controls

The Cryptographic Module (HSM) used to operate the Siemens CA is certified to FIPS 140-2 level 3 and the Common Criteria ("CC"), Evaluation Assurance Level ("EAL") 4+, which is generally equivalent to Information Technology Security Evaluation Criteria (ITSEC) assurance level E3.

6.2.2 Private Key (n out of m) Multi-person Control

Implemented technical and procedural mechanisms that require the participation of multiple trusted employees to perform sensitive Root CA cryptographic operations are implemented. In order to gain access to the Private Keys, N out of M persons are required. No single person has all the activation data needed for accessing any of the Siemens CA Private Keys.

6.2.3 Private Key Escrow

No stipulation.

6.2.4 Private Key Backup

Siemens Root CA's Private Key will be backed up and securely stored for the unlikely event of key loss due to unexpected power interruption or hardware failure at separate sites. Key backup will occur as part of CA key generation ceremony. Backed up CA Private Key remains secret and their integrity and authenticity is retained.

Private Keys will be re-generated using a key regeneration card set. Key re-generation procedure is documented and must be done under dual control in a physically secure site.

6.2.5 Private Key Archival

No stipulation.

6.2.6 Private Key Transfer into or from a Cryptographic Module

Siemens Root CA's Key Pairs are generated in the HSM modules in which the keys will be used.

6.2.7 Storage of Private Keys on the Cryptographic Module

Siemens Root CA's Private Key is held in HSM backup modules in encrypted form. Where Root CA Key Pairs are backed up to an equivalent hardware cryptographic module, such Key Pairs are transported between modules in encrypted form inside the high security cell of the secure facility.

6.2.8 Method of Activating Private Key

Siemens Root CA's Private Key can be activated by introducing the pre-defined number of Operator Cards in the HSM. Root CA Private Key activation requires entry and validation of a PIN/passphrase compliant with specified security parameters.

6.2.9 Method of Deactivating Private Key

After use, the Private Keys shall be deactivated by taking the Operator Cards out of the HSM.

6.2.10 Method of Destroying Private Key

Private Keys shall be destroyed if they are no longer needed, or when the Certificates to which they correspond expire or are revoked. CA Private Key destruction requires the participation of at least three trusted employees. Private Keys shall be destroyed in a way that prevents their loss, theft, modification, unauthorized disclosure, or unauthorized use.

When performed, the destruction process is logged.

6.2.11 Cryptographic Module Rating

In general the HSMs are operated with firmware levels that are certified according to FIPS 140-2 Level 3. Siemens reserves the right to operate its HSMs with OEM firmware at levels or configurations that are not certified according to FIPS 140-2 Level 3 if there is an operational or security need for it and if there is no newer FIPS certified firmware or configuration available.

6.3 Other Aspects of Key Pair Management

6.3.1 Public Key Archival

Siemens CA's Public Keys are backed up and archived as part of the routine backup procedures.

6.3.2 Certificate Operational Periods and Key Pair Usage Periods

The operational period of a Certificate ends upon its expiration or revocation. The operational period for Key Pairs is the same as the operational period for the associated Certificates, except that they may continue to be used for signature verification. The maximum operational periods for Root CA Certificates are set forth in table below.

Certificate	Validity Period
Siemens Root CA Certificate	Up to twelve (12) years

The applicability of cryptographic algorithms and parameters is constantly supervised by the PMA. If an algorithm or the appropriate key length offers no sufficient security during validity period of the Certificate, the concerned Certificate will be revoked and new Certificate Application will be initiated.

6.4 Activation Data

Activation Data refer to data values required to operate Cryptographic Modules such as a PIN, pass phrase. Activation data protection complies with FIPS 140-1, level 3.

6.4.1 Activation Data Generation and Installation

No stipulation.

6.4.2 Activation Data Protection

No stipulation.

6.4.3 Other Aspects of Activation Data

No stipulation.

6.5 Computer Security Controls

All computer security technical controls implemented for the Siemens CAs and Certificate Validation Service are established and documented in accordance to the ISMS Regulations.

All computers at the Siemens CA are subject to constant monitoring. Monitoring results are available 24 hours, 7 days a week. The configuration of system components may only be performed under dual control by operators who have identified with two-factor-authentication.

6.6 Life Cycle Security Controls

6.6.1 System Development Controls

System development controls are provided in accordance with systems development and change management standards of ISMS. Systems development is performed by trusted software supplier(s) in accordance with specifications for secure programming.

6.6.2 Security Management Controls

Siemens CA's security management controls are provided in compliance with Siemens ISMS.

6.6.3 Life Cycle of Security Controls

All Security Controls are audited annually by an external auditor.

6.7 Network Security Controls

The Siemens Root CA is maintained off-line and is not networked with any external components.

6.8 Time Stamp Process

No stipulation.

7 Certificate, CRL, and OCSP Profiles

All digital Certificates issued by the root CAs comply with digital Certificate and CRL profiles as described in [RFC 5280].

7.1 Certificate Profile

Detailed description of the Root CA profiles can be downloaded on <http://www.siemens.com/pki>

7.2 CRL Profile

Published CRLs are conforming to ISO/IEC 9594-8, Recommendation ITU-T X.509 or IETF RFC 5280. Detailed description of the CRL profiles can be downloaded on <http://www.siemens.com/pki>

7.3 OCSP Profile

OCSP responders are conforming to RFC2560, RFC5019 and RFC6960. Detailed description of the OCSP profiles can be downloaded on <http://www.siemens.com/pki>

8 Compliance Audit and Other Assessment

Specified in the Certificate Policy.

9 Other Business and Legal Matters

Specified in the Certificate Policy.

10 References

Specified in the Certificate Policy.

Annex A: Acronyms and Definitions

A.1 Definitions

Specified in the Annex of the Certificate Policy.

A.2 Abbreviations

Specified in the Annex of the Certificate Policy.

CARL - Certification Authority Revocation List