BankID TSPS Merchant v1.0

BankID TSP documents

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1 Introduction

Document history

Version	Date	Changes	Approved by
1.0	29.11.2018	Final version for publishing document.	BankID Policy Board

1.1 Overview

For users not very familiar with PKI and the technical language used in this document, please see the more suitable version in the PKI disclosure statement (PDS), a simplified document to assist the end-user/subscriber (PKI users) in making informed trust decisions before applying for a BankID according to this document. The PDS is based upon the structure according to annex A in ETSI EN 319 411-1 [25] and merged with an earlier version of the general terms and conditions.

This document is the joint core part of the Trust Service Provider Practice Statement (TSPS) for level 1 issuers of BankID. A Level 1 issuer of BankID may either be one single bank or a legal entity owned by and representing a group of banks. In the first case the Registration authority will be the same legal entity as the issuer, in the latter case the RA will be any of the banks represented by the issuer. Provision of parts of the RA services according to this TSPS may be contracted to Vipps AS.

This document describes the Certificate Policy for BankID Certificates for legal persons (MerchantBankID). BankIDs can be issued by Banks affiliated to the Finance Norway Service Office, or Norwegian or foreign banks and credit institutions which have the consent of the Finance Norway Service Office and have agreed to comply with BankID Rules.

This document is unclassified and can be freely distributed. The descriptions of security and technical solutions are therefore at a relatively general level.

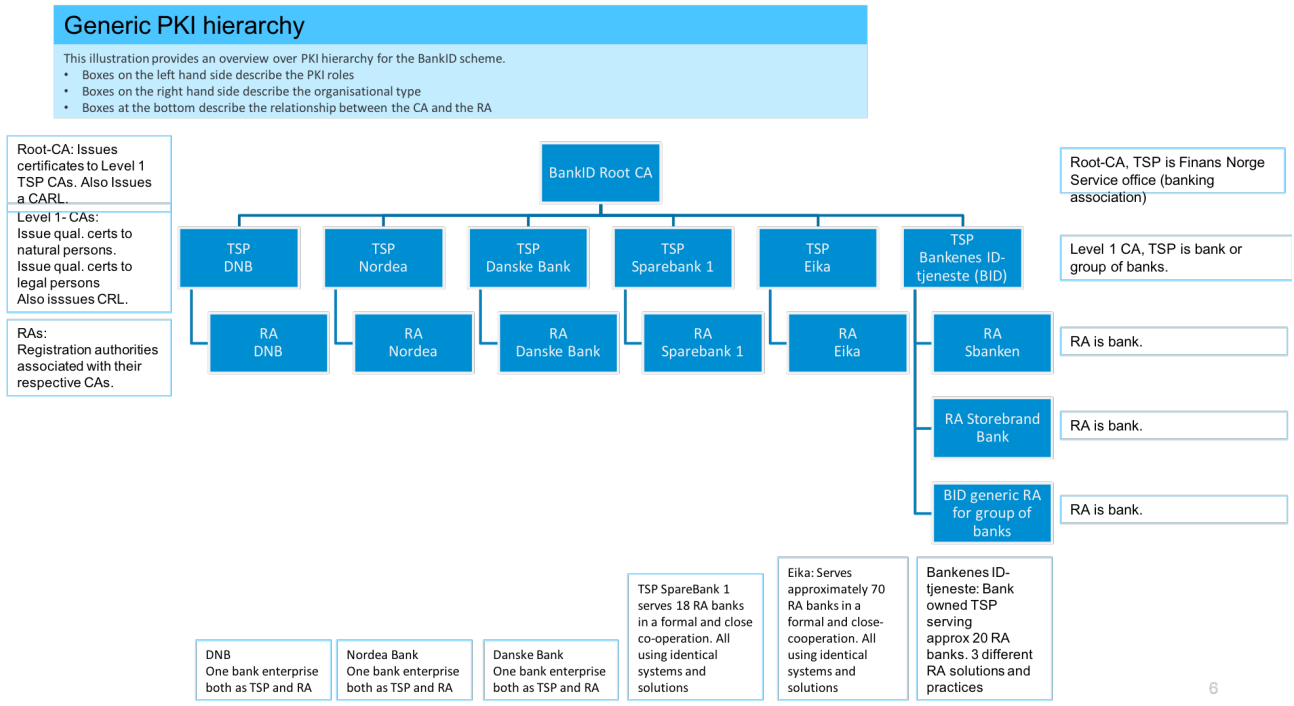
The document is organised in accordance with common practice and international standards for certificate Policy and Certification Framework IETF RFC 3647 [27].

This Certificate Policy outlines the requirements set by all Norwegian banks regarding MerchantBankID. Two variants are specified; a file-based variant, where private keys are stored as a protected file, and an HSM-based variant, where private keys are stored in a physical security module.
A Bank that issues a BankID shall enter into an agreement with the subject. The agreement shall be in the language the bank usually uses in communication with the customer and explain the rights and duties of the subject.
A BankID consists of one, two or three key pairs; each pair consisting of a private and a public key. BankIDs issued in accordance with this version of the Certificate Policy consists of two key pairs.
When a Certification Authority System generates a certificate, the issuer of BankID certifies the link between the public key and the official name of the legal person and its number in the Norwegian Entity Register or an equivalent register. The certificate simultaneously ensures that the public key is protected against change (Integrity protection). Each individual key shall only be used in accordance with the function specified in the certificate.The BankID system is a two-step hierarchy where the certification authority system (CA) of the individual issuer is placed under a common Root-CA [16].
Several parts of this document depend on, and refer to, whole documents or specific parts of documents [3] and [4] which describe internal procedures at the BankID COI Operator. This is unavoidable in a TSPS document, and the clear references are necessary for the purposes of audits and other quality assurance. For security reasons, these

documents are not publicly available, but people with a valid business requirement will be granted access upon request. Parts of the documents referred to will have a higher confidentiality level than this document.

This TSPS is a standard document covering all Level 1 issuers of BankID who use the BankID COI Operator as service provider for common operational infrastructure. Some points in the TSPS documentation refer to the practices of the issuer of BankID and will be supplemented by documents prepared by the issuer. Annex A in this document contains requirements for how individual practices shall be documented.

The TSP issue certificates in accordance with one or more TSPS defined for BankID [10]. This document is aimed at the two versions of MerchantBankID; File-based and HSM-based.
The bank acting as RA take on the roles as responsible contracting partner and Registration Authority (RA).
Provision of parts of the RA services according to this TSPS may be contracted to Vipps AS.
Root-CA issues CA certificates for issuer's CAs. The Root-CA system is run by the BankID COI Operator as service provider on behalf of Root-CA.



The structure (headings and subheadings) in this TSPS is organised in accordance with recommendations in [10].

The key words "MUST, MUST NOT, IS REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, CAN and OPTIONAL" in this document must be interpreted as described in [9]. The exact meaning of these words is modified in accordance with the requirements in the text where they occur.

When the words **MUST**, **SHALL** and **MANDATORY** are used, this means that the definition is an absolute requirement in the specification.

MUST NOT or **SHALL NOT** means that the definition is absolutely forbidden in the specification.

SHOULD or **RECOMMENDED** means that there may be cases where there are strong reasons to ignore a particular subject, but in doing so, one must understand and take into account the full consequence of choosing another solution.

SHOULD NOT or **NOT RECOMMENDED** means that there may be cases where there are strong reasons to, or it would be useful to, perform a certain task, but in doing so, one must understand and take into account the full consequence of performing a task that is described with these words.

CAN or **OPTIONAL** means that the subject/element is optional. One supplier may choose to include an item because a particular marketplace wants it or because the supplier believes that it strengthens the product, while another supplier might omit the same item. An implementation that does not include a particular option must be prepared to interact with another implementation that includes this option, though potentially with reduced functionality. Likewise, an implementation that does include a particular option must be prepared to interact with another implementation that does not include this option (apart from functionality related to the relevant option).

1.2 Document name and identification

This policy document describes the Merchant BankID Certificate Policy. These BankIDs are certificates issued to legal persons who are BankID merchants.

All BankID certificates must contain a unique object identifier (OID) that indicates to which policy the certificate conforms. Based on this field, a relying party or certificate validation service shall automatically be able to determine whether a certificate is appropriate for a particular use. See section 7.1.6 for Object Identifiers for this policy.

The Object Identifier for this document version is 2.16.578.1.16.1.6.1.1.1.0 for Merchant BankID Soft Keystore and 2.16.578.1.16.1.6.2.1.1.0 for Merchant BankID HSM Keystore, where the trailing two numbers designates the version number (major minor).

1.3 PKI participants and responsibilities/obligations

1.3.1 Trust Service Provider

Issuers of BankIDs are organised into a hierarchy with a single root-CA and a subordinate level of issuers of BankID (Level 1). The Root-CA issues certificates at Level 1 in accordance with BankID Rules [1].

The Root-CA was established by the Financial Services Service Office and the Savings Bank Association Service Office. As of 1st January 2010, the Finance Norway Service Office assumed the role of root-CA previously held by the Service Offices. Procedures for operating the root-CA system must be approved by Bits AS (formerly the Norwegian Banks' Standardisation Office (BSK)).

The TSP issues BankIDs, but the agreement [20] with customer/subject regarding the issuance and use of BankID shall always be entered into with a bank performing RA activities.

A TSP might be either a single bank that have established its own Certification Authority System or a group of banks that have established a joint issuing entity performing the issuance of certificates.

The TSP issuing BankIDs in accordance with this document is committed to:

a) Operate in accordance with the terms outlined in this document;

b) Create a document that outlines the bank acting as RA's own practices for subject identification, registration and certificate life cycle management.

c) Use system solutions approved by Bits AS. The approval shall also include the issuer's production environment and any use of service providers.

d) Define, document, implement and review Information Security Policy that is approved by management.

The TSP's Information security policy practices

The Information security policy is part of the TSPs overall governance system, and the implementation and changes is approved by management. If there are changes to the information security policy of relevance to third parties, they will be notified, this includes subscribers, relying parties, assessment bodies, supervisory or other regulatory bodies, TSP´s standard communication channel will be used to communicate changes. The Information Security Policy is part of the TSPS quality system and is documented, implemented and controlled on regular basis either by internal audit or external audits.

TSP is overall responsible for the services set out in this TSPS and Information Security Policies and will see to that the underlaying procedures are sufficient, even if these are carried out by third party. This means the the TSP will ensure adequate and appropriate security controls and operating procedures for TSP facilities, systems and information assets providing the services, are maintained and publish and communicate along with the information security policy to all employees who are impacted by it. The TSP is overall responsible for the service provided and all services outsourced, appropriate security requirements are part of the contract agreement and continuous followed-up with contractor on in regular meetings.

Trust service practices under which the TSP operates are non-discriminatory.

For Bankenes ID-tjeneste: Within this TSP, it is Bankenes ID-tjeneste AS (BID) which is the internal management body responsible for implementing the practices within the organisation.

For Danske Bank: Within this TSP, it is Group IT Security & Risk at Danske Bank which is the internal management body responsible for implementing the practices within the organisation. The Danske Bank Group has a Security Policy and Business Procedures, which cover Cybersecurity. The Security Policy sets out the framework of measures that must be established within the Danske Bank Group in order to institute and maintain the security level specified by the Group’s senior management. The security policy covers the top security requirement for all services on the Group It platform. If low level SOP are needed the system owner covers this. The Security Policy also covers services provided to the Group by external suppliers in connection with outsourcing. In addition, the Security Policy also covers the connection of customers, suppliers and partners to the Group’s IT systems. The Security Policy is implemented in the business procedures and uses the ISO 27001:2013 standard as a reference framework. The Security Policy and the Business Procedures are published on the Intranet. Detailed policy and procedures for key management are also in place. The Group's security policy is the basis for the business procedures. The business procedures apply to all branches, head office departments and other affiliated companies. The security goals and expedients are described on a general level in the form of guidelines. The general paragraphs consist of the following subparagraphs: Target group Responsibility that describes which area/ function is responsible for implementing administrative and technical solutions. Guidelines that explain IT security policy and determine the principles to be implemented in the various areas. In several cases the general guidelines are complemented by detailed requirements that are not immediately apparent from the guidelines.

For DNB: Within this TSP, it is DNB New Business which is the internal management body responsible for implementing the practices within the organisation.

For Eika: Within this TSP, it is the Payment Systems Department which is the internal management body responsible for implementing the practices within the organisation.

For Nordea: Within this TSP, it is the department "Fraud Management" which is the internal management body responsible for implementing the practices within the organisation.

For SpareBank 1: Within this TSP, the Issuer is a common issuer and responsible for facilitating an approved technical system. Each Registration Authority is responsible for implementing the practices within the organisation.

1.3.2 Registration authorities

The Registration Authority (RA) operates in accordance with the terms in this document.

The Bank performing the RA tasks is always responsible for the RA-function. This responsibility is defined in agreements between the bank performing RA tasks and the TSP.

The registration function for certificates issued under this policy is carried out by a unit subject to reporting obligation pursuant to section 4, first and second paragraphs, of the Money Laundering Act.

1.3.3 Subscribers/subjects

For the purposes of this document, the subject is a legal person (private or public sector and administration), registered in the Entity Register or a corresponding public register within the EEA area. BankID issued to legal persons may be used by hardware and applications.

A legal person may be the recipient of a message secured with a PersonBankID or an EmployeeBankID. In interactions between a legal person and a natural person, the legal person must comply with the requirements set out in this policy document. The proprietor of PersonBankID or EmployeeBankID must comply with the requirements set forth in the current policy for its BankID.

For Merchant BankID, the Subject and Subscriber are the same legal entity.

Merchant BankID service is accessible to all applicants whose activities fall within its declared field of operation and that agree to abide by their obligations as specified in the terms and conditions, see section 2.

1.3.4 Relying parties

The relying party may be a BankID Merchant with a merchant certificate or the recipient of a message secured with a BankID belonging to the owner of a personal certificate. In interaction between a merchant and a natural person, the merchant subscriber must adhere to a BankID policy for merchants. This document describes requirements applicable to legal person subscribers only where this is important in understanding the rights, duties and trust levels of the owner of a BankID.

1.3.5 Other participants

The service provider of the CA-system and central storage entity

The service provider of the CA-system and the central storage entity performs the physical, logical and administrative operations of the certification authority system. This can also include responsibility for specifying the characteristics of the interface between a bank that acts as RA, and the certification authority system

1.4 Certificate usage

Substantial effort has been made to ensure the certificate usage is accessible to people with disabilities and comply with WCAG 2.0. No special configuration is needed to make the accessibility features available in the software for certificate use.

1.4.1 Appropriate certificate uses

Certificates issued in accordance with this certificate policy are used between merchant sites and natural persons using BankID to perform the following security services:

- Authentication;
- Digital signing.

Certificates issued in accordance with this certificate policy can also be used by two legal persons who are BankID merchant sites to exchange digitally signed information.

Both parties must have entered into an agreement with their bank about use of BankID. A legal person which is a merchant site must have signed license terms for BankID Server software and documentation as part of an agreement with the Bank to use MerchantBankID, see model agreement [20].

The legal person shall, in cooperation with BankID, use software, hardware or security equipment specified in the agreement with the RA. The RA may add new requirements for software, hardware or security equipment where this is necessary for security reasons or due to necessary BankID upgrades. If BankID is enabled in a computer environment that does not meet the BankID security requirements, this may leave it open to misuse. The RA will provide requirements and advice appropriate user environments.

Customers will be notified if the bank expands or limits the scope of BankID, or limits the transactional amounts allowed. The scope is described in more detail in the user documentation.

1.4.2 Prohibited certificate uses

Everything which is not explicitly allowed, is prohibited.

1.5 Policy administration

Vipps AS is responsible for maintaining this policy. The TSP, bank acting as RA, service providers and Bits AS can initiate TSPS changes. Subjects or users can propose changes through a bank or by contacting Vipps AS directly. Bits AS will manage the change process and review changes in a BankID Policy Board consisting of:

- Bits AS' administration;
- Banks (in their capacity as contracting party to BankID and Registration Authority);
- Vipps AS;
- BankID COI Operator (in their capacity as service provider for root-CA).

Bits AS are responsible for the change approval process. Vipps AS is responsible for managing the control process for new versions.

Bits AS can make editorial or typographic changes without notifying any other party.

Key changes in applicability, certificate content, key storage, key sizes and retention of keys may result in a new policy being created. Major changes in other areas can also create a need for a new policy.

Changes to a TSPS can be made with 90 days' notice.

Changes that in Bits AS' view will not significantly affect a large number of subjects or relying parties can be made with 30 days' notice.

All changes will be notified in writing to registered issuers of BankID, and will be flagged up on BankID's web pages.

All changes, apart from editorial or typographical changes, will be embedded through consultation with the banks.

1.5.1 Organization administering the document

Vipps AS is responsible for developing and managing BankID TSPS. Bits AS administrates Vipps AS' standards and policies on behalf of Vipps AS, and is responsible for maintaining this document. Cf. "BankID Rules" §4.1 [1].

This document has been issued by Bits AS on behalf of participating issuers. Bits AS is also registered holder of BankID policies.
Bits AS
PO Box 2644 Solli
N-0203 Oslo
Norway
Telephone: +47 23 28 45 10
Web site: http://www.bits.no
E-mail: post@bits.no

1.5.2 Contact person

This Common TSPS is registered with Vipps AS and approved by Bits AS. Vipps AS is responsible for the administration and maintenance of this document. The specific sections where it is identified that the TSP individual practices; describing the TSP and bank acting as RA practices are marked. For these sections a separate appendix for this purpose is written by the TSP.

Any questions regarding this document may be addressed to:
Vipps AS
Munkedamsveien 45
N-0250 Oslo
Norway
Telephone: +47 480 33 777
Web site: http://www.bankid.no
Contact: Tommi Pohjaniemi (Compliance manager)

1.5.3 Person determining TSPS suitability for the policy

Bits AS is responsible for verifying that this TSPS is consistent.

Bits AS
PO Box 2644 Solli
N-0203 Oslo
Norway
Telephone: +47 23 28 45 10
Web site: http://www.bits.no
E-mail: post@bits.no

1.5.4 TSPS approval procedures

Each TSP issuing BankID is responsible for additions to the TSPS in cooperation with its service provider. The issuer specific parts of the TSPS shall comply with the policies and this document.

In practice, TSPS documents are compiled by the process of each issuer writing the addendum to the common parts of the TSPS in cooperation with its technical serviceprovider. Any TSPS created within the scope of a BankID policy must be approved by Bits AS. The document must be approved when it is first produced and subsequently if any major amendments are made.

Each TSPS undergoes a yearly review and is included in the internal audit schedule. Compliance with RFC 3647 [27] and ETSI 319 411-2 [26] will be assessed, and any inconsistency remedied.

Before publishing new TSPS, Bits AS as the Policy Board secretary will update this TSPS, according to relevant changes, and document that the approval is recorded in the document history.

1.6 Definitions and acronyms

1.6.1 Definitions

In this document, the following terms are understood to mean:

Activation data: Data, other than cryptographic keys, required to access key stores, and which must be handled securely (e.g. a PIN or password/passphrase).

Authenticate: Confirm/verify an alleged identity. The process ensures authenticity.

Bank: Banks attached to the Finance Norway Service Office, or Norwegian or foreign banks and credit institutions which issue BankIDs with the consent of the FNO Service Office.

BankID: One or more key pairs or electronic certificates that can be used by a bank customer (subject) to secure electronic message exchange with a bank or a bank customer.

BankID COI: BankID's Common Operational Infrastructure

BankID COI Operator: The entity operating BankID's Common Operational Infrastructure and central storage

Certificate (Public Key Certificate): A data sequence containing the subject's public key along with other information which cannot be falsified as the information is signed with a certificate issuer's private key.

Certificate Policy (CP): A document containing rules for how certificates are issued and processed and thereby defining the trustworthiness of the certificates.

Certificate validation service: A trusted service which verifies certificate status for a relying party.

Certification Authority System: The system that generates the BankID. The Certification Authority system signs the subject's public keys and other certificate information with its private key.

Enterprise Customer: For the purposes of this document an Enterprise Customer is a Legal person that is not yet a subject.

Entity Register: Norwegian public register listing registered legal persons in Norway. This register assigns a unique organisation number.

File-based MerchantBankID: A MerchantBankID where the private keys are stored as a protected key file.

HSM-based MerchantBankID: A MerchantBankID where keys are generated and stored in a HSM.

HSM: Security module for physical and logical protection of private keys (hardware).

Installation code: Security code received from the bank as part of the ordering process for a MerchantBankID. This Initial Activation Code is used during the activation of the MerchantBankID.

Invalidate: To block a certificate and make it invalid. A certificate can be temporarily invalidated (suspended) or permanently invalidated (revoked).

Issue BankID: To sign a BankID with the private key associated with a level 1 certificate issued by the root-CA.

Issuer of BankID: A bank or joint issuer that can issue BankIDs.

Joint issuer: A legal person who issues BankIDs on behalf of a group of banks and uses a Level 1 certificate issues by the Root-CA for this purpose (cf. Chapter 1.3.1).

Key store: The logically and physically defined environment where the subject's private key is stored.

Legal person: A juridical person (private or public enterprise and administration) registered in the Entity Register or a similar public register within the EEA, and that has a Norwegian bank account.

Merchant: Sole proprietorships and other legal persons (private or public enterprise and administration) that have been issued with BankIDs for use in communication between the merchant's website and other subjects.

MerchantBankID: A BankID issued to an enterprise and which identifies the enterprise and any units or functions within the enterprise. There are two versions of MerchantBankID. File-based MerchantBankID or HSM-based MerchantBankID.

Object Identifier (OID): A sequence of integers which uniquely identifies an object. Objects in this context, means i.e. a defined information structure or a specification.

Registration Authority (RA): An entity that commits to correctly confirming the identity of a future subject. This must be performed by each individual bank or by a trusted supplier on behalf of the bank.

Relying party: The person who receives a signed document or message with its associated certificate, and who is required to verify and establish trust in the material received.

Service provider: An organisation or entity that carries out practical tasks related to issuance of certificates, or performs other services related to electronic signatures on behalf of banks.

Shared Secret: Information consisting of one or more secret elements, known only to the two involved parties, and where at least one secret element has been distributed via a secure channel. A Shared Secret is used to authenticate the customer's identity during the certification process.

Subject: A bank customer who has registered for the certification service and has been issued with a BankID. In this policy the subject is a legal person. A legal person, who is a subject, can also fulfil the role of relying party.

Validation Service: Ref. Certificate validation service.

1.6.2 Acronyms

Bits Bits AS is the financial infrastructure company of the bank and finance industry in Norway

CA Certification Authority

CP Certificate Policy

CPS Certification Practice Statement

CARL Certification Authority Revocation List

CRL Certificate Revocation List

DN Distinguished Name

ETSI European Telecommunication Standard Institute

FIPS Federal Information Processing Standard

HSM Hardware Security Module

HTTP Hyper Text Transfer Protocol

ICT Information and Communication Technology

IEC International Electrotechnical Commission

IETF Internet Engineering Task Force

ISO International Standards Organisation

ITU International Telecommunications Union

KEK Key Encryption Key

NIST National Institute of Standards and Technology

OCSP Online Certificate Status Protocol

OID Object Identifier

PIN Personal Identification Number

PKI Public Key Infrastructure

RA Registration Authority

RFC Request for Comment

RSA Rivest, Shamir, Adleman

TCP/IP Transmission Control Protocol / Internet Protocol

2 Publication and repository recommendations

Any changes in terms or responsibilities for the issue and use of BankID shall be announced on https://www.bankid.no/personvern-og-regler/ without undue delay and, if necessary, in a new version of this document. In the event of changes to the terms between bank and customer (subject or subscriber), or in the scope of the BankID, this shall be announced by the bank without undue delay. Changes will be communicated through the TSP ´s standard communication channel to the subject

The TSP operates a database of all issued certificates as part of the technical CA-system operated by the CA Service Provider. This is regulated in the operational agreement between the TSP and the CA Service Provider. The information shall be available 24 hours per day, 7 days per week. Up-time shall be minimum 99.7%.

Below is the links to relevant documents for BankID, alternatively, these documents can be requested by email from post@bits.no or using the contact details in section 1.5.1. For questions regarding BankID contact your bank (the issuer of your certificate), you may also find some helpful information here: https://www.bankid.no/en/private/solve-my-bankid-problem/

Subscriber or relying party not able to verify expired certificate status information, usually revocation status information beyond the validity period of the certificates, or other terminated BankID services, can submit their questions using the BankID form: https://www.bankid.no/en/about-us/contact/

Direct links to relevant documents:

- BankID Rules: https://www.bankid.no/globalassets/dokumenter/apne-sider/regler-om-bankid/regler-om-bankid-per-070217.pdf
- BankID root certificate: https://www.bankid.no/en/rootca
- BankID Certificate Profiles: https://www.bankid.no/en/bankid_certificate_profiles.pdf
- PDS Merchant:
    - **For Bankenes ID-tjeneste**: https://www.bankid.no/en/bid_pds_merchant
    - **For Danske Bank**: https://www.bankid.no/en/danskebank_pds_merchant
    - **For DNB**: https://www.bankid.no/en/dnb_pds_merchant
    - **For Eika**: https://www.bankid.no/en/eika_pds_merchant
    - **For Nordea**: https://www.bankid.no/en/nordea_pds_merchant
    - **For SpareBank 1**: https://www.bankid.no/en/sparebank1_pds_merchant
- TSPS Merchant (this document): https://www.bankid.no/en/tsps_merchant

2.1 Repositories

The TSP makes information about revocations available to BankID Certificate Validation Services service providers, see chapter 4.9.

In order to maintain the trust hierarchy, CA certificates will continue to be made available until all underlying certificates have expired.

2.2 Publication of certification information

BankID terms and conditions regarding the use of the certificate are publicly and internationally available in the PDS document, see URLs provided in chapter 2.0 above.

2.3 Time or frequency of publication

Any new version of this TSPS is made public on the web site referred to in section 2 immediately after the version is approved by the approval body described in section 1.5.

2.4 Access controls on repositories

The Certificate database is protected according to security controls found in this chapters 5 and 6 in this TSPS.

This TSPS document is not confidential and can be downloaded and read without restriction.

All policy documention, including this TSPS with appendixes, CRLs, and other information about certificates stored in the storage entity is protected from unauthorised changes.

3 Identification and authentication

3.1 Naming

3.1.1 Types of names

The certificate fields “subject” and ”issuer” shall contain information of the type “Distinguished Name” - (DN) as defined in the X.500 framework. A DN is a sequence of designations (attributes) about an entity (e.g. a natural or legal person) which defines this entity uniquely.

SUBJECT NAME

This document deals with Merchant BankIDs, which are attached to a legal person which acts as a BankID merchant.

Attribute	Importance	Content Requirement
Country (C)	Mandatory	The country where the legal person is registered. Shall have the value 'NO' for legal persons registered in Norway.
Organisation (O)	Mandatory	Shall contain the official name of the legal person as it is registered in the Entity Register or similar public registers.
Serial Number (SN)	Mandatory	Shall contain the organisation number of the legal person as it is registered in the Entity Register or similar public registers within the EEA.
Organisational Unit (OU)	Optional	Field used to enter units or functions within the enterprise.
Common Name (CN)	Mandatory	The commonly used name used for the legal person

CERTIFICATE ISSUERS NAME

In the certificate for the certificate signing key of an issuer of BankID, the "subject" field must contain "Distinguished Name" (DN) information.

Attribute	Importance	Content Requirement
Country (C)	Mandatory	The country where the issuer of BankID is registered.

Attribute	Importance	Content Requirement
Organisation (O)	Mandatory	Must contain the officially registered name of the organisation that owns the Certification Authority System (bank or joint issuer)
Organisational Unit (OU)	Mandatory	Must contain a unique number from the Entity Register that identifies the organisation which owns the Certification Authority System (legal person).
Common Name (CN)	Mandatory	Must contain the text "BankID", commonly used name of CA, the text "bank" and an optional additional alphanumerical value to identify the individual CA if the issuer has more than one.

The same "Distinguished Name" shall also be used as the name of the certificate holder (subject) in the issuer's level-1 certificate.

Further rules for the names in BankID Certificates available in BankID Certificate Profiles [13].

3.1.2 Need for names to be meaningful

The unique identifier in the subject's serialNumber field is usually the organisation number used in the Entity Register or equivalent register of companies in other EEA countries. The format of serialNumber shall be:

- LL-NNNNNNN, where LL is an ISO-3166 country code and NNNNNNN is the number in the relevant national register. Country code is not necessarily used for all Norwegian enterprises.

OR

- DUNS-MMMMMMM where MMMMMMM is a global, unique number allocated by Dun&Bradstreet

The Norwegian letters "æ, ø, å" can be used. Character representation otherwise must comply with Norwegian standard (ISO-8859-1).

3.1.3 Anonymity or pseudonymity of subscribers

Anonymous names are not permitted in MerchantBankIDs.

Pseudonyms are not permitted in MerchantBankIDs.

3.1.4 Rules for interpreting various name forms

No stipulation.

3.1.5 Uniqueness of names

The attributes that make up a certificate holder's DN shall uniquely identify the certificate holder.

Organisation numbers, as defined above, ensures that legal persons are uniquely defined.

The Registration Authority is responsible for verifying that the organisation number is correct and that the legal person is entitled to use it.

3.1.6 Recognition, authentication, and role of trademarks

A trademark or logo should always be used with, or be attached to, the certificate, so users and others who come into contact with the certificate can connect the certificate to the trademark and vice versa. Likewise, the trademark should, as far as possible, be associated with the use of the certificate, including being visible on merchants' sites to show subjects that BankID may be used.

Vipps AS has the rights to the trademark and determines its design and use.

If a TSP or Vipps AS issues or enters into an agreement about an electronic certificate that is not a BankID, the issuer must ensure the certificate cannot be confused with a BankID.

3.2 Initial identity validation

3.2.1 Method to prove possession of private key

Legal persons generate their own keys. For file-based MerchantBankID this happens via software approved by BankID scheme owner. For HSM-based MerchantBankIDs, the keys shall be generated in the enterprise's HSM.

When key pairs are generated, the enterprise customer must prove ownership and control of the private key. This is done by generating and sending a signed request to the BankID CA. If the request can be verified correctly, the CA will generate and publish a certificate based on the corresponding public key.

3.2.2 Authentication of organisation identity

As part of the registration process for MerchantBankID, the applicant must submit a certificate of registration from the Entity Register, the Norwegian Register of Business Enterprises, or from a corresponding register in other countries within the EEA.

Enterprises based outside Norway, but who have an organisation number from the Norwegian Entity Register, can be registered under this number.

Enterprises based outside Norway, that don't have a Norwegian organisation number, can be registered under a foreign organisation number if RA can confirm the enterprise's identity with the same level of trust as a Norwegian certificate of registration.

When ordering a MerchantBankID Certificate, agent shall verify and confirm the identity of the signatory of the Merchant Agreement on behalf of the Merchant, and verifies that the person (s) is signatory or notified to procura on behalf of the Merchant. An authorisation from the Signatory or Procurator to a third person can be attached the applicant.

As part of this signature check, agent shall ensure that a copy of updated company certificate (no older than two months), and that the person (s) signing on behalf of the Merchant shall legitimize for the agent either physically or electronically using BankID (Personal BankID or Mobile Personal BankID). A copy of the company certificate and any physical credentials mentioned above shall accompany the ordering of MerchantBankID.

RA must verify and archive a copy of the identity documents. The bank shall log new agreements to issue BankID. Log data shall be store for a minimum of 10 years, or at least 5 years following the termination of the customer relationship.

BankID Certificates are only issued to merchants who are registered with the Norwegian Central Coordinating Register for Legal Entities or a corresponding public register within the EEA area, and such merchants who have a customer relationship with an authorised issuer of BankID Certificates.

Vipps AS and/or the Issuer may refuse issuance of BankID Certificates to a Merchant due to justifiable reasons (according to Vipps AS or the Issuer reasonable opinion). Justifiable reasons include, for example:

1. that Merchant is engaged in or may use the BankID Certificate for activities in defiance with Norwegian law, or
2. that Merchant's activities or use of BankID Certificates may weaken (i) the confidence in the BankID Service, an issuer or BankID NorwayVipps AS, or (ii) the BankID Service's, an issuer's or Vipps AS reputation or goodwill.

A Merchant shall notify Vipps AS of changes in the information that Merchant has provided when concluding the Agreement as soon as possible, including any change of address, business name, contact persons, etc.

For Bankenes ID-tjeneste: The RA may issue Merchant certificates for use in own (bank) services.

Enterprises (i.e. legal persons) requesting a Merchant certificate will enter into an agreement with an agent, and the agent will order a Merchant certificate through Vipps AS which will issue an order for a Merchant certificate to the RA indicated in the agreement.

The RA will issue a Merchant certificate as soon as possible to the enterprise using contact details given in the order.

The RA will verify:

a) That the Merchant is a customer of the RA

b) That the received documents are sufficient documentation of the Merchant and the persons having signed the agreement on behalf of the Merchant

c) That the agent is a registered agent as per listings from Vipps AS

d) That the ordering information contains no deficiencies of relevance to the issuance process.

For Danske Bank: Danske Bank verifies that relevant documents are signed according to the company certificate (not older than 2 months). Danske Bank also follow relevant AML and KYC procedures.

For DNB: The TSP controls that the Merchant is a customer the TSP, and controls that there are sufficient information to identify the merchant and the person entering the agreement. If the order of Merchant BankID is from a BankID supplier, we control the supplier against Vipps AS official list of Merchant BankID suppliers.

For Eika: Eika group of banks require the following information to identify the enterprise:

Full name and legal status of the Subscriber as defined in the official Norwegian company register (Brønnøysundregistrene).

The Subscribers' Organization Number as defined in the company register (Brønnøysundregistrene).

A document that identifies that the person who by the organization has the given signature right for the organization or per procurator. The RA customer representative will perform checks in accordance with the provisions in the Money Laundering Act.

For Nordea: The following information about the organisation / certificate subscriber shall be presented to the Nordea customer representative before the registration process:

Full name and legal status of the Subscriber as defined in the company register (Brønnøysundregistrene).The Subscribers' Organization Number as defined in the company register (Brønnøysundregistrene). A document that identifies that the person who by the organization has the given signature right for the organization or per procurator. The Nordea customer representative will perform checks in accordance with the provisions in the Money Laundering Act Money Laundering Act.

Nordea employees are already identified and authenticated by Nordea that has all employees' documents (personnel record) after their hiring. Without prejudice to the requirements of law, the identification and authentication process Nordea employees' takes place by direct personal knowledge and could be a little different than the process for externals holders.

Further, if all other circumstances being equal, the following rules are valid for employees and the external persons.

Data and documentation provided are handled through automated procedures strictly for the purposes described above and with the use of security measures to ensure the confidentiality of personal data and to prevent illegal access to data pursuant to eIDAS and Legislative Decree n.196/2003.

For SpareBank 1: TSP only issue certificates to Enterprises with a Norwegian organization number.

3.2.3 Authentication of individual identity

The bank, in the role of RA, shall verify the identity of the person entering into an agreement on MerchantBankID on behalf of the legal person.

The Bank has a duty, governed by laws and regulations on money laundering, to record the credentials of its customers [19]. and the evidence captured is already present to become a bank customer, hence banks require the capture of evidence of identity sufficient to satisfy the requirements of the intended use of the certificate and the applicable law and regulatory requirements.

The following proof of evidence of the physical person shall be securely stored, according to section 5.5:

1) Full name (including surname and given names, consistently with the national or other applicable identification practices) of the subject;
2) Date of birth, reference to a nationally recognized identity document, or other attributes of the subscriber which can be used to, as far as possible, distinguish the person from others with the same name;
3) full name and legal status of the associated legal person or other organizational entity (e.g. the subscriber);
4) any relevant existing registration information (e.g. company registration) of the associated legal person or other organisational entity identified in association with the legal person, consistent with the national or other applicable identification practices;
5) affiliation of the natural person to the legal person consistent with national or other applicable identification practices;
6) [CONDITIONAL]: when applicable, the association between the legal person and any organisational entity identified in association with this legal person that would appear in the organisation attribute of the certificate, consistent with the national or other applicable identification practices; and
7) approval by the legal person and the natural person that the subject attributes also identify such organisation.

The place of birth not registered, as other details are sufficient to correctly identify the individual entity.

Identification of person on behalf of the legal person shall be checked against a duly mandated subscriber either directly, by physical presence of a person allowed to represent the legal person, or shall have been checked indirectly using means which provides equivalent assurance to physical presence(Personal BankID or other EU eIDs certificates that conforms to the QCP-n according to ETSI EN 319 411-2.

Previously collected evidences of the Subject's identity are accepted, provided the quality of assurance of the identity is met.

The person must have signature authority in the enterprise and formally assume responsibility for the enterprise's handling of its MerchantBankID.

The person with signature authority may appoint another person to have the technical and practical responsibility for the enterprise's BankID software, keys and certificates. This includes practical implementation of registration procedures in addition to being contact point in connection with revocation or suspension of the certificate. This may be an employee of the enterprise or an external person employed by a service provider. The identity of this person shall also be verified by the Bank. An authorisation or authorisation hierarchy must be present from the person with signature authority down to the person who has the technical and practical responsibility for registration and installation.

The Bank shall process registration data and other customer data in accordance with the Personal Data Act [14].

By signature of the Merchant Agreement, Vipps AS confirms to Issuer that the person(s) who have signed the Agreement on behalf of Merchant are authorised to sign or have been granted the power of procuration in accordance with the certificate of registration, which is no more than two (2) months old of the date of conclusion for this Agreement. Vipps AS as also confirms that the person(s) who have signed the Agreement on behalf of Merchant have provided Vipps AS with proof of identification.

Subscribers employed in the TSP organisation must follow the same authentication procedures as stated in this chapter, and may not register them selves.

For Bankenes ID-tjeneste: Issuance of a Merchant BankID requires a document that identifies the person who has the given signature right for the organization

In case of certificates ordered for use in own (bank) services the RA will verify that the Merchant BankID ordered from within the RA is ordered by a person employed by the RA with the necessary credentials.

For Danske Bank: Danske Bank verifies that the individual possess a signed request issued by a person with signature authority of the company which provide the mandate to handle the Merchant BankID and related secrets.

The customer name is verified against the central register.

For DNB: No additions.

For Eika: Eika group of banks require the following information to identify the signatory for the enterprise:

A document that identifies that the person who by the organization has the given signature right for the organization or per procurator.

For Nordea: Full name and legal status of the Subscriber as defined in the company register (Brønnøysundregistrene).The Subscribers' Organization Number as defined in the company register (Brønnøysundregistrene). A document that identifies that the person who by the organization has the given signature right for the organization or per procurator.

For SpareBank 1: No additions.

3.2.4 Non-verified subscriber information

Not applicable.

3.2.5 Validation of authority

See section 3.2.3

3.2.6 Criteria for interoperation

Personal information, such as National ID number and name, shall be compared (by registration authority) with information in an official register or other available trusted register with high quality data. The specified information must be proven to match an existing person listed in the register.

For Bankenes ID-tjeneste: The RA representative controls that the signed BankID Merchant agreement is in accordance to certificate of registration and that the signed agreement is containing necessary information.

In case of a Merchant certificates issued by the Banks as RA for use in own services, the Bank will check the employment status and authority of the person ordering the certificate.

For Danske Bank: The customer name is verified against the central register.

For DNB: The TSP controls that the signed BankID Merchant agreement is in accordance to certificate of registration and that the signed agreement is containing necessary information.

For Eika: Eika RA representative controls that the signed BankID Merchant agreement is in accordance to certificate of registration and that the signed agreement is containing necessary information.

For Nordea: No additions.

For SpareBank 1: No additions.

3.3 Identification and authentication for re-key requests

3.3.1 Identification and authentication for routine re-key

For routine re-key the RA offers a self-service solution that uses the existing enterprise certificate to sign the re-ey request. Routine re-key is initiated by the enterprise, usually after prior notification from the RA.

Merchant's BankID Certificate expires after four (4) years, and must be renewed according to the User Documentation within fair time prior to the expiration date, in order for Merchant to continue to use the BankID Certificate.

Merchant will be notified in fair time prior to the expiration of the Merchant's BankID Certificate, in order for Merchant to prepare and carry out the renewal.

Vipps AS inform the Merchant about the expiration dates of their certificates as part of the monthly invoice.

For Bankenes ID-tjeneste: In case of Merchant BankIDs having been issued to an enterprise with an agreement with an agent, Vipps AS will monitor and notify the Merchant and Agent of the need for renewal of the Merchant

BankID prior to expiry, usually 1 month before expiry. The agent will renew the certificate using available tools (HAT) for renewal. An expired Merchant BankID will require a New issuance process as described elsewhere in this document.

Banks acting as RA will monitor the need for renewal of Merchant BankIDs used in their own services, or may delegate this to the bank's service provider acting as agent for the service.

For Danske Bank: Danske Bank do not support renewal via a self-service portal.

For DNB: The TSP is sending a notification prior to expiry date of the merchant certificate. E-mail is sent manually from the RA system to installer of the corticated at least one month prior to expiry.

For Eika: Eika will inform the merchant prior to expiry of merchant certificate. Otherwise no additions.

For Nordea: No additions.

For SpareBank 1: TSP notifies the Enterprise or Vipps AS two months before the expiration, depending on the agreement.

3.3.2 Identification and authentication for re-key after revocation

After revocation the customer must submit a certificate request following the same process as at the initial registration. The procedures in sections 3.2 is followed.

3.4 Identification and authentication for revocation request

The subject may request revocation in the following ways:

- By physical presence, bringing appropriate ID, at the Registration Authority;
- By signed request.

The bank or Registration Authority may apply for independent confirmation before initiating revocation procedures. If a subject wishes to revoke a certificate by unsigned electronic message, the subject must present ID approved by the bank.

For Bankenes ID-tjeneste: A representative from the Merchant, the Merchants BankID supplier or Vipps AS, can contact the RA support center in order to revoke or suspend a BankID certificate, by person in a local branch by presenting appropriate ID (valid passport), by signed request or by telephone to customer service. In the last case also answering a number of control questions.

Reopening and revocation of Merchant certificates are performed by the RAs within normal business hours.

For use of Merchant BankIDs in the banks own services revocation or suspension of a Merchant BankID outside normal business hours if needed can be performed as a part of the banks disaster management.

For Danske Bank: Danske Bank verifies that the individual possess a signed request issued by a person with signature authority of the company which provide the mandate to handle the Merchant BankID and related secrets.

For DNB: The TSP receives requests of revocation from either Vipps AS, BankID supplier or merchant certificate holder. The request must contain OrderID, customer number and name of the merchant certificate holder.

The TSP can revoke certificates themselves when the customer relationship with the merchant expires. The TSP always inform Vipps AS about the revocation.

For Eika: A representative from the merchant can - by person in a local branch - contact Eika Service center in order to revoke or suspend a BankID certificate by presenting appropriate ID (valid passport), by signed request or by telephone to customer service.

For Nordea: Customer service of Nordea shall authenticate all revocation requests.

A subject/customer can contact Nordea customer service in order to revoke or suspend a BankID certificate, by person in a local branch by presenting appropriate ID (valid passport), by signed request or by telephone to customer service.

If contacting customer service by telephone the customer/subject has to prove correct answer to a number of security questions.

For SpareBank 1: The subject may also request for revocation by phone and has to answer a number of security questions if done so.

4 Certificate life-cycle operational requirements

The BankID CA-system and central servers and storage equipment is required to have a general availability of at least 99,7% measured over a one month period.

4.1 Certificate Application

4.1.1 Who can submit a certificate application

Persons shall be identified as described in Chapter 3.

The Registration Authority shall collect all the information about the enterprise and its representatives that is necessary to issue BankID. The service provider verifies that all the information about the enterprise which is required to issue BankID has been received from the RA.

Issuer receives a request to issue BankID Certificate(s) to the Merchant by either Vipps AS or a Agent.

The central storage entity operated by the service provider verifies that all the necessary personal information required to issue the BankID certificate has been received from the RA. If information is missing, the certificate can not be issued. In that case the RA will be notified by the service provider.

For Bankenes ID-tjeneste: RAs will only accept certificate Applications from enterprises with a customer relationship with the bank acting as RA.

For Danske Bank: No additions.

For DNB: No additions:

For Eika: Enterprises with a customer relationship with a bank in Eika Gruppen acting as RA can submit a certificate application.

For Nordea: No additions.

For SpareBank 1: No additions.

4.1.2 Enrolment process and responsibilities

Subscribers and parties relying on the Merchant BankID are informed of the related terms and conditions, as set out in section 2 in this TSPS, before entering into a contractual relationship. These terms and conditions are made available through the TSPs customer system.

The merchant customer receives the following ahead of issuance:

- A copy of the agreement between the bank and the subject [20];
- Guidance on installation and initialisation of keys and certificates, including key generation and instructions for use;

- A shared secret consisting of two components, that is required for the secure issuance and activation of the certificate;
- Software for key generation, certificate request submission and MerchantBankID usage.

As part of the BankID set-up process, the merchant customer will receive a shared secret known only to the bank and the merchant customer's "installer". The merchant customer uses this shared secret for authentication purposes during the issuance of BankID. The shared secret consists of two components: ActivationURL and installation code. These shall be sent via two different channels from the bank to the person designated as the responsible installer at the enterprise. As an alternative to using two channels, both elements can be handed to the merchant customer via a channel that is authenticated and secured against disclosure. The bank is responsible for the distribution of the shared secret.

The certificate issuer shall provide a unique ID to ensure that the combination of "IssuerDN" and "subjectDN" is unique within the BankID domain.

Communication between the RA and the service provider is protected against unwanted disclosure and manipulation as described in Chapter 6. A certificate request is always signed with the RA's private key. This signature is verified, logged and checked before the certificate request is forwarded to the CA on which the RA is entitled to issue certificates.

The root-CA certificate shall be available from several trusted sources (for example, through authorised distributed software).

The enterprise must ensure that the shared secret, the activation data and the private keys don't get compromised.

Prior to key generation, the enterprise shall provide documentation to the bank to show that authorised personnel have signed the relevant license terms. The bank checks this.

See also 3.2.2.

The TSP will log and retain the signed BankID agreement with the Subscriber.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: Terms and conditions are a part of the agreement the customer sign. Danske Bank stores an copy of the agreement in the customer folder.

For DNB: No additions.

For Eika: The legal person applying for a merchant BankID will be presented with the Merchant BankID agreement. The agreement has to be signed by a representative from the entreprise according to section 3.2.3. Otherwise no additions.

For Nordea: No additions.

For SpareBank 1: No additions.

4.2 Certificate application processing

4.2.1 Performing identification and authentication functions

BankID is only issued following an order process that the enterprise customer has actively participated in. MerchantBankID assumes that the enterprise has prepared its system and performed the necessary tests. BankID is only issued when the Bank has approved the order process.

As part of the BankID set-up process, the enterprise customer will receive a shared secret known only to the RA and the enterprise. The enterprise customer uses this shared secret for authentication purposes during the issuance of BankID.

The bank acting as RA shall provide a unique ID to ensure that the combination of "IssuerDN" and "subjectDN" is unique within the BankID domain.

The service provider of the central storage entity notifies the RA that the certificate application has been received.

Communication between the bank acting as RA and the service provider of the central storage entity is protected against unwanted disclosure and manipulation as described in Chapter 6. The certificate order is always signed with the RA's private key. The certificate request is signed with the enterprise's private key. Both signatures are verified, logged and checked before the certificate request is forwarded to the CA-system on which the RA is entitled to issue certificates.

For Bankenes ID-tjeneste: The bank acting as RA will validate the information provided by the agent as described in ch. 3.2 and register the relevant data in its RA Application. The RA forwards an issue request to the CA to proceed with the certificate issuance and information for downloading the certificate is forwarded to the contact information regsitered.

Issuance of a Merchant BankID ID is not available for self-service issuance, and will be issued manually by a Bank employee from the RA Application. Not all banks have legal persons as customers. All banks will however, issue Merchant BankIDs to its own services using contact information to natural persons within its own organization, or to natural persons identified in contacts with a service provider for the relevant service.

For Danske Bank: No additions.

For DNB: No additions:

For Eika: Eika RA will validate the information provided by the applicant. After approval the RA forwards issue request to the CA infrastructure to proceed with the certification issuance.

For Nordea: Nordea representative controls the received documentation and enters the holder's data in the Registration application. Any rejection of the application is communicated by the RA (Nordea) to the applicant and (if present) to the interested third party. Request validation is performed by the Nordea that receives the request and is managed via the same application used to register holder's application. After the approval, the Nordea forwards issue request to the CA infrastructure to proceed with the certification issuance

For SpareBank 1: No additions.

4.2.2 Approval or rejection of certificate applications

For Bankenes ID-tjeneste: Provided the subject is a merchant customer of the bank and there is a valid agreement for a Merchant BankID containing correct information, the Merchant BankID will be issued to the contact information given in the documents received by the bank.

For Danske Bank: No additions.

For DNB: If the certificate application contains incorrect or lack of information can the TSP reject the application. The TSP can also deny BankID merchant certificate if there is a justifiable cause.

For Eika: If the application contains incorrect or lack of information Eika RA may reject the application. The RA may also reject the application for aBankID merchant certificate if there is a justifiable cause.

For Nordea: Nordea reserves the right to reject an application if issuing the certificates are considered to contain too high risk or does not comply with Nordea values or policies.

For SpareBank 1: The registration authority will only accept the certificate application if the Applicant

- is a customer of the bank
- has been successfully identified
- has provided the required data
- has approved the agreement

If there requirements are not met, the application will be rejected.

4.2.3 Time to process certificate applications

Issuing of BankID according to this TSPS is done with user interaction. If the certificate applicant satisfies all the requirements and hence is eligbile for a MerchantBankID, there will be no processing time at the RA for the certificate applications. After the certification request is forwarded from the RA to the CA, the certificate is issued in real time with user interaction, and is available for the enterprise when the certificate is received via the self-service.

The central storage entity receives the certificate order, including a shared secret to be used for activation from the RA via a dedicated interface. After successful validation of the certificate order details, the central storage entity will return the activation parameters to the RA.

The RA will forward the activation parameters and the shared secret to the enterprise applying for a BankID.

The key pair is generated in the subject's secure environment and the public key is from the subject's secure environment via the activation interface to the central storage entity which formats the PKCS#10 certification requests to the CA instance where the bank acting as RA is associated with. The CA instance provides a queuing system and issue the certificates in near real time. The certificate is returned to the subject via the activation interface and also stored in the central storage entity database.

4.3 Certificate issuance

4.3.1 CA actions during certificate issuance

File based MerchantBankID

For File-based MerchantBankID, the enterprise shall generate their own key pairs using software provided by the bank and approved by the issuer. This software shall also create a certificate request for CA.

The software shall store keys in a logically separated, secure data unit, known as the key file (also known as the .bid file). As part of the key generation process, the responsible installer selects a password to protect the key store, which must comply with password rules. Further advice about secure initialisation and activation of MerchantBankID can be found in the document "Security advice for activation and use of MerchantBankID” [22].

HSM-based MerchantBankID

Key pairs for HSM-based MerchantBankID shall be generated in the enterprise's HSM. An HSM that has been tested and uses known interfaces shall be used. BankID software creates, using the enterprise's HSM, a certificate request to CA.

The enterprise will store private keys in HSM, which is a specially secured physical module. As part of the key generation process, the responsible installer selects a password to protect the key store, which must comply with password rules. Further advice about secure initialisation and activation of MerchantBankID can be found in the document "Security advice for activation and use of MerchantBankID" [22].

An HSM for MerchantBankID must physically secure the private key and be able to perform the necessary cryptographic operations involving the private key. There are no general requirements for the operating environment in which the HSM operates or for formal evaluation of its functions.

CA actions

The certification authority system uses information received from the RA and from the certification request from the enterprise, and produces certificates for the enterprise.

All communication between the enterprise and the certification authority system is protected by strong encryption.

The production process for certificates consists of clearly separated parts (or functions) with corresponding subsystems:

The functions are:

1. Validation of certificate requests (unique name, syntax of elements in the certificate request, verification of sender);
2. Certificate generation;
3. Distribution of certificates to the enterprise;
4. Notification to the RA that a certificate has been issued;
5. Updating of order system status.

If any problems occur during the certificate issuance, the issuer revokes any certificate that has already been issued as part of this issuance process and restarts the certificate issuance from the beginning. Depending on the error and its cause, the bank shall notify the enterprises about the cause and request that they initiate a new certificate request based on available data.

The certificate issuer uses its certificate signing key to sign the certificates of the enterprise customer (MerchantBankID).

4.3.2 Notification to subscriber by the CA of issuance of certificate

The distribution and delivery procedures fulfils the following:

The RA distributes a shared secret to the enterprise. The person who performs the registration on behalf of the enterprise, shall use this shared secret together with other data to authenticate himself before certification can take place.

At least a part of the shared secret shall be delivered to the enterprise customer via a secure and authenticated channel.

Upon successful generation the certificates are sent to the subject. If problems occur during any part of the certificate generation, the CA revokes the affected certificates. The enterprise must in this case issue a new order for MerchantBankID for the process to be repeated.

The Bank-RA shall be able to request certificate status information at any time.

The issuer (either bank operating in Norway or any other party authorised to issue BankID Certificates to Merchants) receives a request to issue BankID Certificate(s) to the Merchant by either Vipps AS or a Distributor. Before a BankID Certificate is ordered, Distributor is obligated to verify that the Merchant complies with the

requirements that Vipps AS places on merchants through Vipps AS's installation and quality assurance guide, which is available on Vipps AS's website.

BankID Certificates are issued to the contact person for BankID NorwayVipps AS on behalf of the Merchant or directly to the Merchant if this is preferred by the Merchant.

Merchant shall install, integrate and test BankID Certificates in accordance with the User Documentation and otherwise maintain at any time applicable and necessary security measures of its own systems. Vipps AS is entitled to verify that BankID Certificates are installed and upgraded properly, and Merchant is required to give Vipps AS the necessary access to the Merchant's systems in order for Vipps AS to do so.

The procedures for use, renewal and deletion of BankID Certificates, Software and User Documentation are available in the User Documentation and Certificate Policy.

Merchant shall only use the software, hardware or security equipment in connection with BankID Certificates as set out in the User Documentation.

Merchant is not entitled to assign the Agreement to another party without the prior written consent of Distributor, Vipps AS and Issuer.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions:

For Eika: The subscriber will receive the notification in the activation self-service tool.

For Nordea: The subscriber will receive the notification in the activation self-service tool.

For SpareBank 1: The subscriber will receive the notification in the activation self-service tool.

4.4 Certificate acceptance

4.4.1 Conduct constituting certificate acceptance

The service provider notifies the RA of the issuance of a certificate. The RA in turn is responsible for informing the subject. The bank may choose to let the joint issuer notify the subject directly.

The merchant has indirectly accepted BankID and certificates when:

- An agreement has been entered into, electronically or in writing. If the agreement is in electronic form, it should be signed with an Advanced Electronic Signature or Advanced Electronic Seal.
- The certificate has been generated, and the enterprise has started to use it;

The merchant thereafter has the status of BankID subject.

See 4.3.2 for additional information.

4.4.2 Publication of the certificate by the CA

The CA certificate is published according to chapter 6.8 in the BankID Certificate Profiles [13].

The complete and accurate certificate is available to the subject in the downloaded certificate file using the provided BankID Server software.

4.4.3 Notification of certificate issuance by the CA to other entities

Not applicable.

4.5 Key pair and certificate usage

BankID has different key pairs for authentication and signing

4.5.1 Subscriber private key and certificate usage

For authentication certificates; DigitalSignature(0)/KeyAgreement(4) is used.

For signing certificates; Non-repudiation(1) is used.

4.5.2 Relying party public key and certificate usage

For authentication certificates; DigitalSignature(0)/KeyAgreement(4) is used.

For signing certificates; Non-repudiation(1) is used.

4.6 Certificate renewal

4.6.1 Circumstance for certificate renewal

Routine renewals requires subject involvement and a certificate re-key.

The legal person is responsible for generating new keys and getting them certified before the old keys and certificates expire.

Certificate validity and expiry is described in Chapter 4.7. Renewal is initiated by the subject and can be carried out within a period of 6 weeks before the certificate expiry date. Upon renewal, the Subject can continue using the same activation data (password).

The renewal process consists of these elements:
In case of manual renew (change of names, etc.):

- Check for existence and validity of certificate to be renewed
- Verify correct identity and validity based on the information from section 3.2.3
- Deliver new terms and conditions (if applicable)

Manual and auto renew:

- Merchant creates a new key generation;
- Certification of a new public key;
- Revoking certificate for the old key pair (the certificate will be revoked from the time a new certificate is issued until it has expired).

Vipps AS is responsible for notifying Subject no later than 4 weeks before the certificate and keys expire.

If the Subject fails to renew the certificate before it expires, the Subject will have to follow the same procedure as for renewal after revocation.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: No additions.

For Nordea: Nordea RA systems routinely checks with the Order and distribution system at the central storage entity, which certificates are about to expire.

For SpareBank 1: The Subject is informed two months before expire. The Subject is reminded closer to the expire if the certificate is about to expire.

4.6.2 Who may request renewal

The RA notitifes the subscriber when renewal is due. The subscriber requests renewal via the self-service portal. Only the subscriber may technically request renewal.

4.6.3 Processing certificate renewal requests

The renewal process consists of these elements:

- New key generation;
- Certification of a new public key;
- Proof of possession of both new and old key;
- Request to subjects to delete all traces of old key pairs when new keys are installed in the production environment;
- Certificate expiry for the old key pair

4.6.4 Notification of new certificate issuance to subscriber

After successful generation of the key-pair, the public key is sent to the CA for certification. Upon successful generation the certificates are sent to the subscriber. The subscriber is in full control of the renewal process and, will be notified as part of the renewal-dialog in the self-service portal when th certificate is renewed. If problems occur during any part of the certificate generation, the CA revokes the affected certificates. In this case the enterprise must order a new certificate.

4.6.5 Conduct constituting acceptance of a renewal certificate

The subscriber is informed about the renewal in the self-service dialog.

Acceptance of renewal takes place when the end user finalise the renewal procedure.

4.6.6 Publication of the renewal certificate by the CA

The renewed certificate is published to the central BankID database immediately after renewal.

4.6.7 Notification of certificate issuance by the CA to other entities

All entitities in the BankID ecosystem will have access to the renewed certificate immediately after renewal.

4.7 Certificate re-key

4.7.1 Circumstance for certificate re-key

Ordinary re-key is performed as part of the renewal process .

Re-key outside the regular renewal intervals shall be used if there is a requirement to change the key size or hash function, or if there is a suspicion that the end user’s keys have been compromised.

4.7.2 Who may request certification of a new public key

The RA may request certification of a new public key, but the subscriber must invoke the renewal function via the BankID Server software.

4.7.3 Processing certificate re-keying requests

See 4.6.3

4.7.4 Notification of new certificate issuance to subscriber

See 4.6.4

4.7.5 Conduct constituting acceptance of a re-keyed certificate

See 4.6.5

4.7.6 Publication of the re-keyed certificate by the CA

See 4.6.6

4.7.7 Notification of certificate issuance by the CA to other Entities

See 4.6.7

4.8 Certificate modification

4.8.1 Circumstance for certificate modification

There is no support for certificate modification for MerchantBankID. A new certificate will have to be issued.

4.8.2 Who may request certificate modification

Not applicable.

4.8.3 Processing certificate modification requests

Not applicable.

4.8.4 Notification of new certificate issuance to subscriber

Not applicable.

4.8.5 Conduct constituting acceptance of modified certificate

Not applicable.

4.8.6 Publication of the modified certificate by the CA

Not applicable.

4.8.7 Notification of certificate issuance by the CA to other entities

Not applicable.

4.9 Certificate revocation and suspension

The RA or the TSP may, in order to invalidate a certificate, choose either to revoke it permanently or to suspend it. A suspended BankID can be reopened, if the bank is certain of the identity of the owner and there no longer is any basis for the suspension.

In general, the requirement for certainty and dialogue with the subject will be more stringent to revoke a certificate than to initiate a time-limited suspension.

The RA or service provider shall log and archive all requests for invalidation, including how the request was received and what action the issuer initiated.

Immediately after revocation or suspension of a subject's certificate, the TSP will inform the Subject and Subscriber of the status change and reason, through the RA or it's operator according to agreed contact point.

The TSP is obliged to make correct and updated information available for the certificate validation service. Information about invalidated certificates shall be available 24/7/365.

This shall contain all invalidated (revoked and suspended) certificates.

Issuers of BankID shall generate an updated revocation list at least once per hour and immediately make the list available to certificate validation services. The Certification Authority System must send real-time updates to certificate validation services between each revocation lists update. This list shall be archived for audit and control purposes.

The TSP generates an updated revocation list at least once per hour and immediately make the list available to certificate validation services. The CA-System's database of certificates and their statuses is available for the certificate validation services providing certificate status at the CA-system in real time.

Once a certificate is flagged as revoked in the central RA system it is not possible to reinstate the certificate.

4.9.1 Circumstances for revocation

Certificates shall be revoked when the private key associated with the certificate is compromised or suspected to be compromised, or when the information in the certificate is known to be inaccurate.

Examples of causes for revocation are:

- Unauthorised or suspected unauthorised access to private keys;
- Lost keys;
- Compromised or stolen activation data;
- Known misuse of a certificate;
- The enterprise has changed name;
- The enterprise is no longer entitled to have a certificate;
- The enterprise goes bankrupt or stops trading;
- The enterprise terminates its customer relationship with the bank.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: All conditions sufficient for revocation are also sufficient for suspension. In addition, a request by phone is accepted, if there is reasonable reason to believe that the request represents the subject's wishes.

In case of phone requests the requestor will be identified in a way that Eika considers as sufficient and secure.

For Nordea: Nordea customer shall contact customer service to revoke their certificate issued by Nordea.

For SpareBank 1: No additions.

4.9.2 Who can request revocation

The following can request revocation:

- Named employees or other representatives for the enterprise, who are known to CA;
- The bank that has entered into an agreement with the customer;
- Registration Authority;
- The TSP;

Another operator or body may be the police, Nordic Financial CERT, BID, Bits AS, BankID COI Operator, Finance Norway, Vipps AS or another RA.

Courts may rule to invalidate a certificate. The TSP must enact any such ruling.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: The TSP receives requests of revocation from either Vipps AS, BankID supplier or merchant certificate holder. The request must contain OrderID, customer number and name of the merchant certificate holder.

The TSP can revoke certificates themselves when the customer relationship with the merchant expires.

For Eika: No additions.

For Nordea: No additions.

For SpareBank 1: No additions.

4.9.3 Procedure for revocation request

The subject may request revocation in the following ways:

- Upon physical presence, bringing appropriate ID, at the Registration Authority;
- By signed request.

The Registration Authority may apply for independent confirmation before initiating revocation procedures. If a subject wishes to revoke a certificate by unsigned electronic message, the subject must present ID approved by the RA. The RA shall verify the request for revocation by contacting the responsible person at the merchants. If the RA fails to get confirmation, and there is reason to believe that the request is warranted, the certificate shall be suspended until the enterprise has verified or cancelled the request.

If a RA or TSP is unable to maintain its obligations to other participants in the BankID partnership, there are routines for revocating all certificates for the bank and its customers.

The TSP, bank acting as RA, and their service providers log and archive all requests for invalidation, including how and when the request was received, what action the issuer initiated and the revocation reason. The request for invalidation is processed on receipt.

In case of revocations initiated by other bodies, it is the responsibility of Vipps AS to notify the agent/legal person.

For Bankenes ID-tjeneste: In case of breaches of agreement between an agent and a legal person, or in case of termination of service, the bank will receive a revocation request from Vipps AS.

Requests for revocation of a Merchant BankID may be sent or justified in the following ways:

- The subject may send the request by letter, fax or a scanned, signed document sent by e-mail. The signature will be verified against signatures already in the RAs possession.
- The subject may request revocation by personal attendance at the RA's premises.
- The subject may terminate his relationship as customer in which case the certificate will be revoked automatically by the RA.

For Danske Bank: No additions.

For DNB: The TSP always inform Vipps AS if revocation of merchant certificate.

For Eika: The Eika customer must contact customer service to revoke their certificate issued by the Eika CA.

When a bank in Eika Gruppen receives a request for revocation, this is forwarded to Eika Service Centre (ESS), where the revocation occurs. Eika Service Centre then sends a confirmation to the bank that this has been done. The status is then automatically changed also in the RA solution.

Revocation is only performed by Eika Service Centre. Only the banks request revocation from Eika Service Centre.

For Nordea: No additions.

For SpareBank 1: No additions.

4.9.4 Revocation request grace period

Relevant revocation/suspension information shall be available to certificate validation services no later than 15 minutes after the revocation request was registered and accepted. In some situations where operating deviations occur (see section 4.9.7), invalidation information may not be updated over a longer period.

4.9.5 Time within which CA must process the revocation request

Revocations have priority in the queing application at the CA-system and will always be performed before issuing or renewing functions. After the CA-system has processed the revocation request from the RA, the CA-database is immediately updated with the certificate status.

In practice, the OCSP responder is set up to have real-time access to the CA-database, and hence always has real-time information about the status of any certificate issued by the CA.

The Subject is prohibited from using the private key if the status of the certificate in the CA-database is not active.

4.9.6 Revocation checking requirement for relying parties

The relying party is required to request a revocation status for all involved BankID certificates as part of a BankID transaction using authentication or signing keys.

In addition, the relying party is required to take account of any limitations on the usage of the certificate indicated to the relying party either in the certificate or the terms and conditions in chapter 1.4 or the PDS and take any other precautions prescribed in agreements or elsewhere.

4.9.7 CRL issuance frequency

The certification authority system produces a signed revocation list (CRL) every 60 minutes. The CRL is archived on the certification authority system. All CRLs contain information about when the next CRL shall be made available. If necessary, it is possible to force the creation of a CRL before the next planned CRL.

A new CARL is generated at least once a year with a nextUpdate of 1 year after the issuing date. A new CARL is generated once a CA certificate has been revoked.

4.9.8 Maximum latency for CRLs

All CRLs from the CA-system is issued with a grace period of 24 hours.

4.9.9 On-line revocation/status checking availability

The TSP delivers an OCSP service which is available 24/7/365 for end users and relying parties.

4.9.10 On-line revocation checking requirements

An on-line certificate status check shall be used where a response is obtained from a trusted Certificate validation service.

The Certificate validation service has direct acess to the certificate status database in the CA system. Other subjects or relying parties cannot expect to directly access lists with suspension and revocation information. All BankID subjects and relying parties will have access to the Online Certificate Status Service to request information on the status of a certificate (validation).

The Certificate Status Service may have access to national identification numbers or other additional information about subjects, but will only make such additional data available to relying parties with legitimate requirements, and with whom they already have an agreement to this effect.

A request must be sent to the certificate Status service and be formatted in accordance with the OCSP protocol [11]. A certificate validation request from a merchant is signed with the relying party's private key. A certificate validation request from an end user is signed with the central storage entity's private key. The certificate validation service checks the signature in the request. The response from the certificate validation service is also in accordance with the OCSP protocol and signed with the certificate validation service's private key. Signatures shall be checked by both parties.

In accordance with the OCSP protocol, the certificate validation service will give the response "valid" for certificates that have not been revoked or suspended. If the certificate is marked as invalidated in the certification authority system's database, the certificate validation service will give the response “invalidated”. The certificate validation service will give the response “unknown” for all certificates if the certification authority system's database is unavailable.

The certificate validation service can deliver additional information about the subject whose certificate the control request has been made for. The certificate validation service checks the authorisation of relying parties who request additional information. If the relying party has requested additional information from the certificate validation service, both request and response must be sent over a secure channel (TLS).

The Certificate validation service Servers and Database is synchronised with UTC at least every 24th hour.

4.9.11 Other forms of revocation advertisements available

Not applicable.

4.9.12 Special requirements re key compromise

Not applicable.

4.9.13 Circumstances for suspension

The TSP supports suspension (time-limited invalidation).

All conditions sufficient for revocation are also sufficient for suspension. Additionally, notification by phone to bank acting as RA or TSP is accepted. The bank acting as RA may also choose to offer its subjects the opportunity to suspend their own BankIDs through self-service solutions, i.e. in an online banking environment.

Suspension may be initiated when the subject asks for revocation, but cannot present sufficient evidence of ownership to have BankID revoked. The same requirements apply for notification to the subject etc. for suspension as for revocation.

The bank acting as RA may also choose to suspend BankID when a person other than the subject calls on behalf of the subject, and he/she can justify why a suspension shall be initiated. The bank shall always control the identity of the contact person in accordance with standard practice.

The same requirements apply for notification from the bank to the subject etc. for suspension as for revocation.

4.9.14 Who can request suspension

Those who can request suspension are the same as those who can request revocation, as described in section 4.9.2.

4.9.15 Procedure for suspension request

The subject may request suspension in the following ways:

- By physical presence, bringing appropriate ID, at the Registration Authority;
- By signed request.

The bank acting as RA may also choose to offer its subjects the opportunity to suspend their own BankIDs through self-service solutions, i.e. in an online banking environment.

The bank acting as RA may also choose to suspend BankID when a person other than the subject calls on behalf of the subject, and he/she can justify why a suspension shall be initiated. The bank shall always control the identity of the contact person in accordance with standard practice.

The same requirements apply for notification from the bank acting as RA to the subject etc. for suspension as for revocation.

For Bankenes ID-tjeneste: Same procedure as for Revocation, cf. 4.9.3. Additionally requests by telephone are accepted for suspension. The RAs will accept suspension requests by persons acting on behalf of the subject. On suspension the subject will be notified.

For Danske Bank: No additions.

For DNB: Vipps AS, supplier or merchant certificate holder can send a order for reopen the certificate no later than 30 days after revocation.

For Eika: The suspension is logged in the relevant follow-up system. Eika uses a service provider only for the suspension, not for re-opening or revocation, and when the service provider performs suspensions, Eika receives a report on these.

For Nordea: Nordea assures a suspension service: for urgent requests, due to theft, loss or breach of security, by telephone with a customer service (+47 2320 6002) available around the clock on all business days and holidays; in other cases, the service is available during office hours (8.xx-16.xx).

For urgent suspension requests, the subject, at the request of the operator, must prove his or her identity and give the pass-phrase received with certificates. Where the identity of the person submitting the request is not established, the certificate will be suspended on a precautionary basis.

For SpareBank 1: The subject may also request for suspension by phone and has to answer a number of security questions if done so.

4.9.16 Limits on suspension period

The certification authority system is designed to automatically track suspension periods. If the suspension period for a certificate exceeds 30 days, the certification authority system will revoke the suspended certificate and archive the relevant information in a central database.

The system supports reopening suspended BankID certificates within the 30-day suspension period. A suspended BankID will only be reopened if it has been proven within the suspension period that there no longer is any basis for the suspension.

Reopening is initiated by the RA that has ordered the certificate after it is shown that the grounds for suspension are no longer present. All requests for the reopening of a suspended BankID are logged. The log entry documents how the subject was identified.

4.10 Certificate status services

4.10.1 Operational characteristics

The service provider of the CA and central storage entity operates the certificate validation service on behalf of all the TSPs. The service is operated from two physically separated operational environments providing resilience and operational stability.

4.10.2 Service availability

The certificate validation service is available 24/7/365.

4.10.3 Optional features

The certificate validation service may optionally include in its response any of the following information items, if requested by a relying party - provided that the relying party has been granted access by the RA.

- Social Security number of the subject of the Person- or EmployeeBankID requested status for
- The associated BBAN account number of the Person- or EmployeeBankID requested status for
- The organisation number from the national number of enterprises of the Employee- or MerchantBankID requested status for

The RA will grant access for relying parties for one or more of the information elements above, according to National Law - i.e. the Personal data act.

4.11 End of subscription

The subscriber may without prior warning terminate the agreement with the TSP.

The TSP or bank acting as RA may terminate the agreement with 4 weeks warning for objective reasons. If the TSP terminates the agreement the reason shall be communicated.

The TSP or bank acting as RA may terminate the agreement with immediate effect if the subject has been found guilty of gross misconduct and breach of the agreement.

Upon termination, the subject shall immediately destroy all software and documentation that the subscriber has been given in order to use BankID.

The BankID certificates will at the same time be revoked.

If the the end user subscription with the mobile operator is terminated, the certificates associated with the subscription will be withdrawn.

If an agreement between a mobile operator and a bank is terminated, all certificates associated with the subscriptions held with this mobile operator will be withdrawn.

4.12 Key escrow and recovery

BankID does not issue or support certificates with key usage encryption.

Private keys (authentication and signing keys) associated with MerchantBankID are generated and used in an environment under the sole control of the subscriber.

For file based MerchantBankID, the subscriber may take backup copies of the encrypted key-file.

For HSM based MerchantBankID, the subscriber may export and take backup copies of the key-file according to the security mode of the HSM where the keys were generated.

Merchants makes their own key on file or in an HSM and take backup of keys according to their own routines.

4.12.1 Key escrow and recovery policy and practices

Not applicable.

4.12.2 Session key encapsulation and recovery policy and practices

Not applicable

5 Facility, management, and operational controls

5.1 Physical controls

Physical security barriers and controls are implemented to control access to the certification authority system hardware and software. This includes central servers, HSMs that allow access to private keys and other limited data in the central storage facility, as well as any external cryptographic hardware module or smart card. All physical access to these areas is logged by the service provider.

All private keys are physically protected as described above. This applies to Level 1 CA's own keys for signing certificates and CRLs, keys used for secure communication between the CA and the central infrastructure units, and private keys stored in the central storage entity.

The CA-system also has facilities for storing backups and distribution media that is sufficiently secure to prevent loss, forgery or unauthorised use of stored information. Backups are stored both for data repair reasons and for the purposes of archiving of important information. Backups are stored at an alternative location to enable reconstruction in case of a disaster at the primary location.

Periodic security checks are performed at the CA location and in the central storage entity.

The Service Provider performs a visual monthly check to ensure that the CA system and all associated cryptographic devices that are not in use are securely stored, that the physical security systems (door locks and alarms) work as intended, and that there have been no attempts at break-ins or unauthorised access. The results of such checks are logged.

All physical, organisational and personnel-related security controls are approved by the TSPS approval body (Bits AS).

For Bankenes ID-tjeneste: There are physical barriers and controls to control access to the RA-applications hardware and software and all physical access to these areas are logged.

Logical access are usually given to two persons jointly. Communication between RA-application and COI are secured and signed. Archival and storage solutions for backups and distribution media that are sufficient to prevent loss, falsification or unauthenticated use of information, and to conform to requirements for archiving, are in place.

For Danske Bank: Documented and approved procedures are in place that detail physical and logical access controls to data. Access to the Group’s internal production and test systems, customer orientated systems, network components and external systems must be obtained via an access control system checking user authenticity. All entrances are furthermore covered by CCTV. Twice a year System Managers receive lists showing all system access users in their area and what authorisations the users have. The System Manager is responsible for confirming that staff have the correct access.

For DNB: Security checks are covered in the agreement with the providers and are in conformity with current regulations and the TSP's requirements for security solutions. The Registration Authority (RA) complies with the rules in the requirement document issued by Bits AS. To ensure such compliance, the banks go through Bits AS’s quality control process and are otherwise monitored by means of compliance audits of CPS every three years.

Corporate information security requirements are the TSP's requirements for information security. The requirements are given in accordance with Group guideline for information security, and will be elaborated in standards and/or internal quality control system where applicable. Corporate information security requirements expresses requirements that should be followed across the Group. If requirements concerning

information security are given elsewhere, for instance in regulations or directives, the strictest requirements apply. The information security requirements are based on internationally recognized information security standards.

For Eika: Physical security barriers and controls are established to control access to Eika Gruppen's BankID solution and associated systems.

The security information associated with CA and RA and issued to Eika Gruppen in connection with the key ceremony in BankID COI, is physically protected and securely stored according to the internal routines of Eika Gruppen.

Eika Gruppen is of the opinion that these routines are sufficient to prevent loss, forgery, or unauthorised use of stored information.

For Nordea: No additions.

For SpareBank 1: Physical security barriers and controls are implemented to control access to the registration authority system hardware and software. All physical access to these areas is logged.

5.1.1 Site location and construction

For the CA-system and central servers and storage equipment

All production tasks take place in an environment with multiple layers of physical and logical security.

In the security rooms the walls are protected with an intrusion grid from floor to the ceiling. The area is monitored by cameras outside/inside the room.

5.1.2 Physical access

For the CA-system and central servers and storage equipment

The production environment is divided into different security zones. Access rights and user roles are defined for each zone. Only defined user roles are granted access to their designated secure zones.

Access to the CA zone requires at least two people with different user roles to be present to operate as intended (ref. section 5.2). The access control system is able to recognise the individuals and their roles, and there is more than one authentication mechanism in place before access is granted to the CA-system or to devices that store confidential data associated with the certification service. The operation of production equipment for central storage equipment containing or handling end user keys and other strictly confidential data is governed by the same rules as for the CA-system.

Routines for access control are defined and enforced by the Service Provider. Physical entrance logs are checked against the user logs once per month. The effectiveness of physical access controls is tested and checked at least annually

The BankID service is run inside dedicated security rooms in different data centers. There is dual access for entering the security room. Physical keys for entering the security room are stored within a KeyWatcher and access are given to certified personell only. Both certified personell has to enter PIN code to take out the physical keys within the KeyWatcher. After opening the physical locks, they need to swipe their ID cards simoultanisly and enter their personal PIN codes in order to enter the room. Once inside the room both certified personell need to swipe their cards within a time limit, to prevent the intrusion alarm to be released. If this procedure is not followed, the alarm will be triggered and 24/7 onsite security personell are alerted. Both the KeyWatcher and the security room are monitored 24/7 by cameras. Logs are regulary reviewed by the security officer.

All visitors has to be authorized by personell that are responsible for physical access to the data center, in order to achieve this access the visitor has to deposit their official ID card, fill in a visitor declaration including security instruction, and have certified personell approving and accompanied the visitor throughout the visit. When inside the security room, a physical log book is updated with the name of the visitor, date, time in and time out, reason for the visit and a referral to the certified personell accompanying them. The visitor is accompanied until checking out and leaving the BankID COI Operators premises.

For Bankenes ID-tjeneste:For the RA-Applications used by the RAs, access to secure zones are governed by strict access controls and procedures for physical and logical Access and is only available for properly authorized personell .

For Danske Bank: No additions.

For DNB: No additions.

For Eika: All production equipment is placed in a secured environment with multiple layers of physical and logical security. The production environment is divided into different security zones. Access rights and user roles are defined for each zone. Only defined user roles are granted access to their designated secure zones.

The data halls are dimensioned to resist serious and long-term unforeseen events that can lead to disruption. Backup are contained in these data halls or in secured external locations.

For Nordea: Located outside the PKI premises are the components that interoperate both with Nordea network and with Internet, and the workstations to record users' credentials, and to submit requests to CA. The workstations for the approval of the certificates issue requests do not require a physical security level higher than that of normal workstations.

For SpareBank 1: Only authorized personnel have access to the data center where the registration authority system hardware and software are located. All access to these areas is logged. Operations of the HSM’s demands multiple people present.

5.1.3 Power and air conditioning

For the CA-system and central servers and storage equipment

The production environment is equipped with an air conditioning system.

The equipment is protected against direct damage due to power outage and is equipped with additional power supply/circuits. The additional power supply also covers the air conditioning and the alarm system.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: No additions.

For Nordea: The data centres of Nordea have redundant systems. The air-conditioning systems regulate temperature and control humidity. A supervision system monitors the state of technological systems (electrical and air conditioning systems) 24/7 all year round and allows to locate any anomaly quickly.

For SpareBank 1: For the RA system: Data centres have air conditioning system, Uninterruptible Power Supply and backup power generator.

5.1.4 Water exposures

For the CA-system and central servers and storage equipment

The production environment is protected from water intrusion and water damage. Electronic sensors have been installed to trigger warnings in case of water intrusion.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: No additions.

For Nordea: The production environment is protected from water intrusion and water damage. Electronic sensors have been installed to trigger warnings in case of water intrusion.

For SpareBank 1: For the RA system: Data centers are protected from water and both datacenters can operate alone in case the other one is unavailable.

5.1.5 Fire prevention and protection

For the CA-system and central servers and storage equipment

The production environment is protected against fire. Automatic fire alarm and extinguisher systems are installed that do not damage hardware or data.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: No additions

For Nordea: The fire prevention and protection system is composed by a smoke detection system and a fire suppression system.

For SpareBank 1: For the RA system: Both data centers have automatic fire alarm and fire extinguishing systems.

5.1.6 Media storage

The TSP has policy and procedures for secure handling and protection of media from damage, theft, unauthorised access and obsolescence. The media management procedures shall also protect against obsolescence and deterioration of media within the period of time that records are required to be retained.

Media are stored in the same room as the certification authority system, e.g. to the same security standards. All media that are removed from the secure room are sealed and processed in accordance with ”BankID Internal Security Procedures” [3]. All media and storage objects containing sensitive data will be electronically shredded after use. Only Trusted roles have access to the media and are the ones that carry out these procedures.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Daily backups are stored in the same room as the certification authority system, i.e. according to the same security standards.

For Nordea: All media storage containing software and data, audit logs, archives, or backup information are stored within the datacentres of the Nordea with adequate physical and logical access controls designed to limit access only to authorized personnel and protect such media from accidental damage. Encryption materials are protected by locked safes, cabinets and containers. The opening and closing of cabinets or containers is recorded for audit checks.

For SpareBank 1: Media are stored in the same room as the RA system or in a safe with limited access.

5.1.7 Waste disposal

For the CA-system and central servers and storage equipment

All media containing sensitive information should be securely destroyed before disposal. This is described in "BankID-Internal Security Procedures" [3].

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: All media containing sensitive information are adequately deleted by approved software or equipment before it is disposed of.

For Nordea: No additions.

For SpareBank 1: For the RA system: All media is destroyed as part of disposal procedures.

5.1.8 Off-site backup

For the CA-system and central servers and storage equipment

For the central infrastructure, backups are managed in such a way that all data in the certification authority system are replicated to another location with the same security level to ensure that the system can be recovered after a possible disaster. Data traffic between locations is routed a secured and closed network.

For Bankenes ID-tjeneste: Secure copies of data used and generated in the RA Application are stored in a separate location to the production site.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Backup systems ensure continued operation in cases of disruption. The security for dualised solutions is the same as the security for regular production solutions.

Backups are stored under the same security regimen as the production environment.

For Nordea: Nordea performs backups of critical system data, audit logs and other sensitive information by means of a synchronous remote copy. The secondary site is in synchronous remote copy.

For SpareBank 1: For the RA system: Both data centers can operate alone in case the other one is unavailable.

5.2 Procedural controls

5.2.1 Trusted roles

Access to information and application system functions is restricted in accordance with the TSP's access control policy, and practices set out in this document. The TSP system shall provide sufficient computer security controls for the separation of trusted roles identified in TSP's practices, including the separation of security administration and operation functions. Particularly, use of system utility programs shall be restricted and controlled.

a) Security officer: Overall responsible for administering the implementation of security policy and practices which falls within the specific services delivered;A role is, for the purpose of this document, defined as the right to perform certain tasks. The following trusted roles have been defined for operational tasks associated with BankID issuing systems and Registration Authority:

b) System administrator: Authorised to install, configure and maintain the CA trustworthy systems;

c) System operator: Responsible for operating the CA trustworthy systems on demand. Authorised to perform CA backup and recovery;

d) System auditor: Authorised to view archives and audit logs of the CA trustworthy systems;

e) Compliance manager: Responsible for testing and verification of compliance, in addition to also performing the system auditor role;

f) Registration Officer, responsible for approving end entity Certificate generation and revocation

g) Revocation Officer, responsible for approving end entity Certificate revocation

Managerial personnel: Responsible for all Security roles and responsibilities, as specified in this TSPS are documented in job descriptions or in documents available to all concerned personnel. Trusted roles are named by the management and is accepted by the management and the person to fulfil the role. Managerial personnel are experienced or trained with respect to the trust service that is provided, familiar with security procedures for personnel with security responsibilities and experience with information security and risk assessment sufficient to carry out management functions. Regular review of user access privileges for trusted roles are carried out, when individuals change jobs internally or leave the company the access rights are removed. All TSP personnel use personnel user accounts with privilege access rights in order to identified and authenticated every user before using critical applications related to the service.

Key custodians: Responsible for secure storage and entry of components of cryptographic keys and passwords in accordance with a risk assessment for the type of key. May be people appointed by Bits AS, the Issuing banks or the trust service provider organisation.

Personell with a trusted role has other access and higher privileges than general functions at the TSP. Access rights are approved by management for named individuals based upon the principle of segregation of duties and least privilege access. There are specific requirements that applies for trusted roles since this position is very sensitivity based on the duties that they perform and access levels they have, and access rights will be granted to personnel

only after all necessary checks are completely performed. See section 5.2 and 5.3 in this document for practices performed for background screening, skills, experience, training and awareness.

TSP management see to that all TSP personnel in trusted roles are free from conflict of interest that might prejudice the impartiality of the TSP operations. To comply with this requirement there are internal and external audits, as well as risk assessments carried out and approved by TSP management.

5.2.2 Number of persons required per task

For the CA-system and central servers and storage equipment

At least two persons fulfilling two separate roles of 5.2.1 must be involved to obtain physical access to the CA trustworthy systems, or perform security sensitive operations on those systems. For access to the CA system both persons must undergo multiple levels of authentication, and present evidence of identity including two factors, something they have and something they know.

At least two individuals must be assigned and trained to perform each role.

Personnel at the service provider (both permanent and temporary) shall have job descriptions designed from the view point of roles fulfilled with segregation of duties and least privilege. It shall however always be clear in which role the person performs a certain task at the CA trustworthy systems.

The tasks of key generation and initialisation of secured storage media for the CA trustworthy systems shall require at least three persons to be present, in the roles c), d) and f) listed above.

After the initial key generation, the person(s) in role f) – key custodian – will be equipped with a specific security element, e.g. a card that has to be entered and read into a security module. This will make it possible to distinguish security-sensitive tasks involving the key custodian from normal operation of the CA trustworthy systems.

If keys are to be split into components for storage, a key custodian must be present for each part that the key is split into.

When media or components that may contain secret keys, are disposed of, at least two trusted persons in two roles must be present to ensure that sensitive data contained in the compoents are securely shredded.

For Bankenes ID-tjeneste: Handling of CA and RA security elements are regulated and documented through various routines, requiring at least two persons being involved in all handling of CA and RA security elements associated with the BankID system itself.

BID has in its possession CA security elements that have been issued by BankID COI under the key ceremony for CA, securely stored un a safe requiring two person access, one of them being BIDs Key Custodian

The RAs have in their possession RA security elements that have been issued by BankID COI under the key ceremony for the RA. These are installed in HSMs requiring twoperson access (operator and Security Officer). After installation they are stored in sealed security envelopes in safes.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: The operators and technical staff at Eika Gruppen and its operational supplier may, based on a risk evaluation, have access to the operational environment alone, and can perform tasks on the BankID solution. To access the systems, they must, however, undergo multiple levels of authentication, and present evidence of identity including “something they know” and “something they have”.

The roles in sub-chapter 5.2.1 – ”Trusted Roles” – are staffed and documented in Eika’s BankID routines. Backup roles are also defined for them, in cases of absence.

Eika Gruppen has in its possession CA and RA security elements that have been issued by BankID COI under the key ceremony for CA and RA issuance for the various RA banks (Registration Authorities) associated with Eika. Handling of such CA and RA security elements are regulated and documented through various routines at Eika. The routines require at least two persons being involved in all handling of CA and RA security elements associated with the BankID system itself.

Destruction of CA and RA security elements at Eika are regulated by internal routines, and when these are to be disposed of, at least two trusted persons will be present to ensure that the destruction is in accordance with regulations.

Eika Gruppen’s security policy for BankID establishes that employees cannot have other assignments that could conflict with duties and responsibilities arising from BankID roles. This is relevant e.g. for those who have control responsibilities internally in the bank. Naturally, they will not have tasks related to what they are supposed to review/revise.

For Nordea: At least two persons fulfilling two separate roles of 5.2.1 must be involved to obtain physical access to the CA trustworthy systems, or perform security sensitive operations on those systems. For access to the CA system both persons must undergo multiple levels of authentication, and present evidence of identity including two factors, something they have and something they know. At least two individuals must be assigned and trained to perform each role. Personnel at the service provider (both permanent and temporary) shall have job descriptions designed from the view point of roles fulfilled with segregation of duties and least privilege. It shall however always be clear in which role the person performs a certain task at the CA trustworthy systems.

The tasks of key generation and initialisation of secured storage media for the CA trustworthy systems shall require at least three persons to be present, in the roles c), d) and f) listed above. After the initial key generation, the person(s) in role f) – key custodian – will be equipped with a specific security element, e.g. a card that has to be entered and read into a security module. This will make it possible to distinguish security-sensitive tasks involving the key custodian from normal operation of the CA trustworthy systems. If keys are to be split into components for storage, a key custodian must be present for each part that the key is split into. When media or components that may contain secret keys, are disposed of, at least two trusted persons in two roles must be present to ensure that sensitive data contained in the components are securely shredded.

For SpareBank 1: The TSP has the following practices:

- Two persons from different departments is needed for for handling HSM backup
- Two persons from different departments is needed to access HSM backup keys
- Multiple persons is defined at Key Custodian
- Multiple persons is defined as personnel for handling HSM backup
- Multiple persons is defined as personnel with access to HSM backup keys
- Multiple persons is defined personnel as System administrator

5.2.3 Identification and authentication for each role

For the CA-system and central servers and storage equipment

CA key pair generation and the subsequent certification of the public key, is undertaken in a physically secured environment by personnel in trusted roles. The number of personnel authorized to carry out these functions is kept to a minimum with certified and named persons authorised to access the secure premises and perform the certification process.

- Authorised personnel need to be employed by the service provider and thus identified by the HR department.

- Authorised personnel need to be authorised to a specific trusted role by senior management.

The detailed procedures for identification and authentication is described in the security documentation of the operator of CA and central storage entity.

For Bankenes ID-tjeneste: BID, RAs and RA-application providers use personnell with experience and training necessary for provision of services with the required quality, in accordance with functions and roles performed by the personell involved.

For Danske Bank: CA key pair generation and the subsequent certification of the public key, is undertaken in a physically secured environment by personnel in trusted roles. The number of personnel authorized to carry out these functions is kept to a minimum with certified and named persons authorised to access the secure premises and perform the certification process.

- Authorised personnel need to be employed by the service provider and thus identified by the HR department.
- Authorised personnel need to be authorised to a specific trusted role by senior management.

The detailed procedures for identification and authentication is described in the security documentation of the operator of CA and central storage entity.

For DNB: The Key Custodian also updates the standard procedure, and relevant objects when needs change. Key Custodian rutines is confidential.

For Eika: Those who hold the certain trusted positions within BankID in Eika Gruppen, will be personnel specially qualified for this. To be considered for such a responsibility, it is a requirement to have prior experience from working with BankID in both a commercial and a technical sense. They will have competence on specific system functionality, processes, and security.

For Nordea: No additions

For SpareBank 1: For hiring and training, ordinary routines for identification at the TSP is used. All personnel are authenticated before performing any tasks.

5.2.4 Roles requiring separation of duties

For the CA-system and central servers and storage equipment

The service provider has established a segregation of duties through an organisational structure. The following roles need to be separated:

- Security Officer
- System Administrator
- System Operator
- System Auditor
- Registration Officer and Revocation Officer

For Bankenes ID-tjeneste: BIDs CA keys are stored in a safe with two person access and only used for key ceremonies at the COI. The RAs keys are stored in HSMs at the RA Application providers.

BID, RAs and RA-application providers have procedures for granting, maintaining and monitoring access to critical resources. Such controls are also a matter of national regulations for the delivery of financial services.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Eika Gruppen's security policy for BankID establishes that employees cannot have other assignments that could conflict with duties and responsibilities arising from BankID roles. This is relevant e.g. for those who have control responsibilities internally in the bank. Naturally, they will not have tasks related to what they are supposed to review/revise.

For Nordea: See section 5.2.1.

For SpareBank 1: The TSP has a segregation of duties through an organizational structure. Multiple persons ensure control of changes. The following roles need to be separated:

- System administrator
- Product Owner

5.3 Personnel controls

5.3.1 Qualifications, experience, and clearance requirements

Personnel working with the certification authority system or central storage entity are individuals with autohrised trusted roles, solid PKI and BankID expertise. All personnel at the service provider are employed for at least 6 months and given proper training before they can access the certification authority systems.

The BankID COI Operator has established and shall maintain recruitment screening processes and training processes for personell who will work on the system. This is documented HR routines and IT training plans. In addition the BankID COI Operator has specific training for new employees or consultants.

For Bankenes ID-tjeneste: Requests for Mercant BankID are received by email from Vipps AS..

Critical activities on the RAs part are those that concerns ordinary tasks like authenticating new customers and maintaining the customer's records. Those are basic processes of an bank and audited internally, as well as through audits by Finanstilsynet,

Personnel operating the RA-application are required to have knowledge and experience to perform that role.

For Danske Bank: RA IT system**:** Danske Bank eBusiness Security department is primarily staffed with personnel who have expert knowledge, experience and qualifications from experience and secondarily staffed with personal who have acquired the knowledge through formal training.

For DNB: Both the service providers' and the TSP's personnel are required to have the requisite knowledge, experience and qualifications to perform their roles properly. It is deemed acceptable for an operator to have a Personal BankID issued by the Registration Authority in which the person in question works.

For Eika: Those who hold certain trusted positions within BankID in Eika Gruppen, will be personnel specially qualified for this. To be considered for such a responsibility, it is a requirement to have prior experience from working with BankID in both a commercial and a technical sense. They will have competence on specific system functionality, processes, and security.

The level of training is adapted to individual roles and areas of responsibility. Persons with specific tasks related to BankID at Eika Gruppen will receive thorough training both before and after starting their tasks. There are also semi-annual gatherings within both Payment and IT, where current issues are presented to the banks' Payment managers and IT managers respectively.

Personnel will not have access to the trusted functions until any necessary checks are completed and formally appointment is confirmed.

Se also sub-chapter 5.2.1 - "Trusted roles".

For Nordea: The same practices applies for the RA.

For SpareBank 1: Specific routines, guidelines and training material have been created for the BankID area.

5.3.2 Background check procedures

The service provider will always check job-seeker references. Personnel working with the CA or "archive management and information security systems" will always be subject to a security meeting conducted at the start of the assignment and then annually.

The service provider is not authorised by law to require an employee or job-seeker to submit a police clearance certificate but will, in the event of doubt, conduct an extended reference check.

For Bankenes ID-tjeneste: The same practices applies for the RA.

For Danske Bank: RA IT System: Danske Bank personnel have a defined job description and appropriate roles assigned in order for them to perform their specific tasks based on a need to know and least privileged principle as well as segregation of duties. All employees are required to perform an annual awareness training. TSP specific functions in form of a security administration, operation and audit including cryptographic key management requires additional training and awareness.

For DNB: Employees must not have other tasks that could conflict with the obligations and responsibilities that follow from their roles relating to the issuance of BankIDs through the relevant Registration Authority. In addition the TSP's guidelines for HR and recruitment applies.

For Eika: Eika Gruppen performs certain background checks of people that apply for employment.

Personnel will not have access to the trusted functions until any necessary checks are completed and formally appointment is confirmed.

For Nordea: The same practices applies for the RA.

For SpareBank 1: For hiring ordinary routines and guidelines at the TSP is used. New employees are background checked.

5.3.3 Training requirements

No personnel are granted access to the BankID production system until they have reached a sufficient level of proficiency in the pre-production system.

All personnel who require access to the production systems must have been employed for a minimum of 6 months and have demonstrated their knowledge and skills in the test environment. The security officer will meet with the relevant personnel to convey instructions about security and knowledge related to the value chain.

All personnel have received extensive PKI and BankID training.

Personnel receive training according to the BankID COI Operator routine descriptions for new personel. On call personel must comply with additional requirements and routines and must be evaluated to have sufficient competence level before they are given access to the system.

For Bankenes ID-tjeneste: Employees of the RA performing tasks related to establishing and maintaining customer data, authentication procedures and maintaining certificate status are given training in products, procedures and applications used.

For Danske Bank: RA IT System: Danske Bank eBusiness Security department is primarily staffed with personnel who have expert knowledge, experience and qualifications from experience and secondarily staffed with personal who have acquired the knowledge through formal training.

All employees are required to perform an annual awareness training. TSP specific functions in form of a security administration, operation and audit including cryptographic key management requires additional training and awareness.

Information security training is provided to all the employees in the Group. Information security awareness eLearning covering topics such as phishing, social engineering, confidential information, malware, identity theft, cloud services, etc. is mandatory for all the employees. More specific security awareness training for relevant roles like advisors, workstations administrators, etc. is provided to the specific employees. Phishing tests are performed regularly to improve the awareness of the employees. The training material is reviewed regularly to keep it relevant and up to date.

For DNB: No additions.

For Eika: The level of training is adapted to individual roles and areas of responsibility. Persons with specific tasks related to BankID at Eika Gruppen will receive thorough training both before and after starting their tasks. There are also semi-annual gatherings within both Payment and IT, where current issues are presented to the banks' Payment managers and IT managers respectively. The employees also receive continuing training and competence maintenance relating to how the need is evaluated from case to case.

Line management is responsible for initiating necessary training concerning BankID for employees who need this.

Se also sub-chapter 5.2.1 - "Trusted roles".

For Nordea: The same practices applies for the RA.

For SpareBank 1: RA officers has to complete a digital training course before getting access to the RA system.

5.3.4 Retraining frequency and requirements

All BankID personnel working with BankID on a daily basis are also involve in changes to the infrastructure. For releases of new software in production, the people who have followed the release through test environments must be present.

In addition, periodic training updates on new threats and current security practices are conducted at least every 12 month to establish continuity and updates in the knowledge of the personnel and procedures.

For Bankenes ID-tjeneste: The same practices applies for the RA.

For Danske Bank: In addition, periodic training updates on new threats and current security practices are conducted at least every 12 month to establish continuity and updates in the knowledge of the personnel and procedures.

All Danske Bank employees are required to perform an annual awareness training. TSP specific functions in form of a security administration, operation and audit including cryptographic key management requires additional training and awareness.

For DNB: Periodic training updates will be carried out to establish continuity and updates in the knowledge of the personnel and procedures.

For Eika: The level of training is adapted to individual roles and areas of responsibility. Persons with specific tasks related to BankID at Eika Gruppen will receive thorough training both before and after starting their tasks. There are also semi-annual gatherings within both Payment and IT, where current issues are presented to the banks' Payment managers and IT managers respectively.

Se also sub-chapter 5.2.1 - "Trusted roles".

For Nordea: The same practices applies for the RA.

For SpareBank 1: All BankID personnel work with BankID on a daily basis.

5.3.5 Job rotation frequency and sequence

There is no formal job rotation scheme deployed for personnel in trused roles. Changes in roles do occur and is managed through training and competences management with respect of segregation of roles where applicable.

For Bankenes ID-tjeneste: HR guidelines for each participant Bank applies.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: There is no formal job rotation scheme deployed for personnel in trusted roles. Changes in roles do occur and is managed through training and competences management with respect of segregation of roles where applicable.

For Nordea: The same practices applies for the RA.

For SpareBank 1: There is no formal job rotation scheme deployed for personnel in trusted roles. System administrators are rotated to make sure enough personnel have good knowledge of the system.

5.3.6 Sanctions for unauthorized actions

All personnel are responsible for their actions. Authorised personnel working for the service provider who seriously violate policies and practices described in this TSPS, either negligently or intentionally, shall:

a) Have their access revoked;

b) Be subject to internal disciplinary proceedings;

c) Potentially face criminal prosecution.

For Bankenes ID-tjeneste: The same practices applies for the RA.

For Danske Bank: Danske Bank has disciplinary sanctions in place in the Group HR policy and practices.

Danske Bank personnel have a defined job description and appropriate roles assigned in order for them to perform their specific tasks based on a need to know and least privileged principle as well as segregation of duties.

For DNB: No additions.

For Eika: Breach of the BankID and ICT guidelines and directives can lead to consequences for the user's rights and employment conditions with Eika Gruppen. Violation of these guidelines and directives can lead to dismissal or that the user is being refused access to all of or parts of the ICT system. In addition, Eika may implement sanctions according to other rules.

External hired consultants can be subject to similar sanctions.

For Nordea: The same practices applies for the RA.

For SpareBank 1: TSP have routines for handling unacceptable actions by employees. Standard routines are used for BankID related cases as well.

5.3.7 Independent contractor requirements

Contract staff performing trusted roles and tasks must have been in employment with their current employer for at least 6 months. Contract staff may be subject to the same sanctions as employees in the event of violation of instructions.

During training there are specific topics on the BankID COI Operator security framework and Secure SDLC. In addition there is a separate review of NDA with consultants and employees.

For Bankenes ID-tjeneste: All contracting personnel at RAs or Service Providers performing trusted roles and tasks, are subject to the same regulations as permanent employees.

For Danske Bank: No additions.

For DNB: Security checks are covered in the agreement with the providers and are in conformity with current regulations and the TSP's requirements for security solutions.

For Eika: Contract staff in Eika Gruppen performing trusted roles and tasks must have been in employment with their current employer for at least 6 months. Eika can make exceptions for staff that is known to them from previous engagements. Contract staff may be subject to the same sanctions as employees in the event of violation of instructions.

For Nordea: The same practices applies for the RA.

For SpareBank 1: TSP has routines for handling security sensitive information that also applies to BankID related matters. All employees and hired personnel must sign a confidentiality agreement.

5.3.8 Documentation supplied to personnel

All personnel are given the necessary documentation to perform their tasks.

Documentation regarded as particularly sensitive shall be kept within the service provider's premises. Personnel employed by the bank, registration authority, issuer, Vipps AS, Bits AS or the service provider who legitimately need to know, can be granted permission to read these documents in areas approved by Service Provider, provided they sign a non-disclosure agreement.

5.4 Audit logging procedures

For the CA-system and central servers and storage equipment

These procedures apply to all devices involved in the issue of certificates and CRL.

The audit log is a tool for documenting and retrieving information about events concerning security in BankID. The audit log can be seen as a distributed set of data located at RA, Certification Authority System and central storage entities. The individual parties will provide additional information about local requirements for implementation in their security documentation.

The audit log is used to maintain a secure production environment.

The logs are stored securely and in such a way that they can be made available for review in a timely manner.

All audit logs are backed up by sending all logs to a central log repository. In the central log repository, all logs are rotated and kept according to section 5.4.3. Central log repository is replicated in two separate locations inside secure rooms. All sensitive information is stored in the security rooms. There are two separate disc cabinets in two separate data centres. Only authorised personell can access the information. All access to this information are requested and logged in the BankID COI Operator Change management system.

For Bankenes ID-tjeneste: The RA Application Service Providers have logs for management of RA keys.

For Danske Bank: RA IT System: In Danske Bank, all orders between the RA and the issuer system are logged in protected DB2 tables. Access to the tables are controlled by the FT system. Only employees with a job-related need have access to the logs.

In addition, following events are monitored:

- Startup and Shutdown are monitored and alerts are generated.
- Availability and Utilization are part of standard operational monitoring

For DNB: All communication between the issuer and ODS (order and distribution system) is logged by means of activity controls in the RA system. This also includes status requests, the initiation of revocations and suspensions of certificates. Access to the log is protected by the bank’s authorisation system and the logs may only be accessed by authorised personnel Important events during the operation of certification authority systems shall be stored for a minimum of 10 years. Other elements in the security log will be stored for a period of between 3 months and 10 years based on assessments of the need and risk.

For Eika: All audit logs are kept for as long as the BankID regulations and the Norwegian laws requires. Logs of status modifications to the certificate are stored for 10 years. Backup are normally also stored for 10 years.

The logs are stored securely and in such a way that they can be made available for review in a timely manner. All log information is stored according to legal requirements in the BankID regulations or Norwegian law. If the Eika Gruppen terminates as TSP, the logs will be preserved in a readable way for as long as Eika Gruppen's legal requirements are still valid.

Eika Gruppen also has various security systems to protect their solutions and systems, including logs.

All security policy changes in Eika Gruppen are revised in a traceable manner.

Eika produces electronic event logs that, among other things, log all status modifications to BankID certificates and various security events

Eika also has logs attached e.g. to document handling, CA and RA security elements, and various revisions..

Eika has event logs also for reported events.

For Nordea: No additions.

For SpareBank 1: These procedures apply to all RA system components:

The audit log is a tool for documenting and retrieving information about events concerning security in BankID.

The audit log is used to maintain a secure production environment.

The logs are stored securely and can be made available for review in a timely manner.

5.4.1 Types of events recorded

For the CA-system and central servers and storage equipment

The following events are recorded in the CA-system and at the certificate validation service. The log function also includes failed attempts at triggering these events.

- System (operating system) starting and stopping;
- Starting and stopping of all applications in the certification authority system;
- User administration in the certification authority system;
- All changes to software/parameters in the certification authority system;
- Login/logout to/from operating system and applications in the certification authority system;
- All requests and associated messages;
- Issued Certificates;
- Renewals and associated messages;
- Changes and renewals of key materials in the certification authority system;
- Revocation messages and associated messages.

Most of these events are automatically logged in the certification authority system. Some events are logged manually, such as software changes, policy changes, and renewal of Level 1 key material.

The following events are logged by the service provider for the central servers and storage.

- System (operating system) starting and stopping;
- Starting and stopping of all applications;
- All changes to software/parameters;
- Renewal of key materials;
- User administration;
- Login/log out information;
- Information about the end user and relying party;
- Relevant information about the transaction (identity validation/signing).
- All firewall and router activities are logged.
- NTP sync

Most of these events are automatically logged in the central storage entity. Some events are manually logged, such as software changes.

For Bankenes ID-tjeneste: The audit log record relevant Certificate events on the RA as well as events during the operation of the RA system.

For Danske Bank: No additions.

For DNB: All communication between the issuer and ODS (order and distribution system) is logged by means of activity controls in the RA system. This also includes status requests, the initiation of revocations and suspensions of certificates. OTP validations are also logged. Access to the log is protected by the bank's authorisation system and the logs may only be accessed by authorised personnel. Required documentation e.g. passport is stored on customer profile in our internal customer handling system

For Eika: Eika produces electronic event logs that, among other things, log all status modifications to BankID certificates.

Eika also produces electronic event logs that, among other things, log different system and hardware events.

Eika has logs attached e.g. to document handling, CA and RA security elements, and various revisions.

Eika has event logs also for reported events.

As issuer of BankID Eika Gruppen owns a CA in BankID COI. In connection with the initial key ceremony and later key ceremonies various keys and other security elements were issued to Eika. These keys and security elements have been delivered to Eika Gruppen's key custodian, so accordingly Eika has in its possession various security elements associated with CA – Eika Gruppen's role as TSP issuing BankID. Each of these security elements is stored safely and any changes in their storage or usage is logged.

For Nordea: No additions.

For SpareBank 1: The audit log record relevant events:

- Events on the RA
- Events during the operation of the RA system

The following events are logged:

- System (operating system) starting and stopping;
- Starting and stopping of all applications;
- All changes to software/parameters;
- Login/log out information;
- Information about the end user and relying party;
- Relevant information about the transaction (identity validation/signing).

The events are automatically logged. Some events are manually logged, such as software changes.

5.4.2 Frequency of processing log

For the CA-system and central servers and storage equipment

The logs are created in real time and can be inspected at any time by an operator with sufficient access rights. CA system and central servers in the operating infrastructure are either automatically monitored on a continuous basis, with alerts for security-sensitive events and traces of hostile behaviour, or reviewed by an operator with sufficient privileges, at least once a day.

For the CA-system the following applies:

The CA system signs all database entries with it's own internal CA key, related to Issuing, suspending and revocation of certificates, as well as tasks done in the CAO by an authorized operator. All archived logs are kept in 2 separate secure room in two separate datacenters for 10 years.

Audit logs from certification authority systems are monitored continuously and alarms are sent to the Security Officer in case of suspicious events. The Security Officer conducts weekly random checks to look for abnormal events. Every 6 months an extended verification of audit logs for the certification authority systems takes place.

For the RA-system

For the RA bank systems the following applies:

RA systems have routines for automatic reviews that shall recognise specific negative events and trends.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: In Danske Bank, the audit logs are created in real time and are automatically monitored for abnormal incidents in real time. Any abnormal incidents are reported via notification/alarm to Danske Bank 24-hour monitoring centre. The centre then contacts the relevant departments/people at Danske Bank.

For DNB: No additions.

For Eika: Eika Gruppen has various security systems to protect their solutions and systems, including monitoring of a number of different system and customer events based on the threat level at any given time.

Eika Gruppen's BankID solution is monitored. The logs are created in real time, and they are constantly available for operators with sufficient right of access.

Eika Gruppen will further retrieve and review event logs as needed. The logs will be reviewed by an operator with sufficient right of access.

All security policy changes in Eika Gruppen are revisioned in a traceable manner.

For Nordea: For the RA bank systems the following applies:

RA systems have routines for automatic reviews that shall recognise specific negative events and trends.

For SpareBank 1: No additions.

5.4.3 Retention period for audit log

Logging and use of BankID certificates is stored for 10 years after the certificates expires.

Audit logs are stored for 10 years.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: Important events during the operation of certification authority systems shall be stored for a minimum of 10 years. Other elements in the security log will be stored for a period of between 3 months and 10 years based on assessments of the need and risk.

For Eika: Current data records and logs are stored securely in the ICT systems. Eika Gruppen also regularly performs backups of all their data records and electronic event logs for the RA solutions.

Manual logs are stored securely protected, if this is considered necessary.

All audit logs and log information are kept for as long as the BankID regulations and the Norwegian laws requires. Logs of status modifications to the certificate are stored for 10 years. Backup are normally also stored for 10 years.

The logs are stored securely and in such a way that they can be made available for review in a timely manner. All log information is stored according to legal requirements in the BankID regulations or Norwegian law.

Logs of status modifications to the certificate are stored for 10 years. Backup are normally also stored for 10 years.

For Nordea: No additions.

For SpareBank 1: No additions.

5.4.4 Protection of audit log

For the CA-system and central servers and storage equipment

Audit logs on the CA system are signed with the issuer's private key and timestamped. Section 5.2 contains a description of who has the authority to read logs on the certification authority system.

Audit logs are protected at the same level as the data in the CA-system. Manual logs are stored in the same physical security zone as the certification authority system. Only personnel with authorised access to the certification authority system can therefore access these logs.

Central log repository is replicated in 2 separate datacenters inside corresponding secure rooms, and all access to them is monitored and logged.

For Bankenes ID-tjeneste: The RA-Application logs are integrity protected.

For Danske Bank: No additions

For DNB: No additions.

For Eika: Current data records and logs are stored securely in the ICT systems. Eika Gruppen also regularly performs backups of all their data records and electronic event logs for the RA solutions.

Manual logs are stored securely protected if this is considered necessary.

For Nordea: No additions.

For SpareBank 1: RA Security logs are kept in a safe environment. Only approved personnel can access the logs.

5.4.5 Audit log backup procedures

For the CA-system and central servers and storage equipment

For the CA-system and central servers and storage equipment, server and application generated logs are backed up at least once every 24 hours. All logs are integrity protected.

Backups are stored in a separate location, subject to the same access control as the original.

Audit logs are processed by the normal routines for backups that exist within the certification authority system.

Manual logs are backed up routinely.

All audit logs are backed up by sending all logs to a central log repository. In the central log repository, all logs are rotated and kept for 10 years. Central log repository is replicated in 2 separete locations inside secure rooms

Backups are taken every day, and copied to the security room in the secondary data center.

For Bankenes ID-tjeneste: The RA-Application logs are backed up and backups available at a physically separate backup site.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Current data records and logs are stored securely in the ICT systems. Eika Gruppen also regularly performs backups of all their data records and electronic event logs for the RA solutions.

Manual logs are stored securely protected if this is considered necessary.

For Nordea: No additions.

For SpareBank 1: All RA logs are generated by the system and backups are made according to ordinary backup routines.

5.4.6 Audit collection system (internal vs. external)

For the CA-system and central servers and storage equipment

The audit collection system is internal.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: See sub-chapter 5.4.5 – Audit log backup procedures.

For Nordea: Nordea uses internal SIEM tool as collection system for the RA-system audit logs.

For SpareBank 1: The RA Audit collection system is internal.

5.4.7 Notification to event-causing subject

For the CA-system and central servers and storage equipment

There is no requirement to notify the Subject who caused an audit event.

5.4.8 Vulnerability assessments

The operation of the CA and central storage entity is subject to periodic vulnerability assessments and whenever a critical part of the operation is changed. The assessment covers the operational infrastructure, cryptographic equipment, the physical environment, data storage, software, personnel, processes and procedures and communication.

The service provider perform a regular vulnerability scan on public and private IP addresses and record evidence that each vulnerability scan was performed by a person or entity with the skills, tools, proficiency, code of ethics, and independence necessary to provide a reliable report.

The service provider conducted a penetration test on the CA and the central storage infrastructure at set up and after infrastructure or application upgrades or modifications that the TSP determines are significant. The service provider keep record of evidence that each penetration test was performed by a person or entity with the skills, tools, proficiency, code of ethics, and independence necessary to provide a reliable report.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: Vulnerability assessment is part of the annual Risk assessment of BankID and RA solution.

For Eika: Eika Gruppen performs vulnerability assessment of the BankID solution according to the continuous threat situation.

For Nordea: No additions.

For SpareBank 1: As part of major changes in services and infrastructure, a vulnerability assessments is conducted.

5.5 Records archival

5.5.1 Types of records archived

For the CA-system, central servers and storage equipment

All events related to management of CA keys will be signed and stored in the CA database (by the CA Operator credentials) and also in written copies in the Key Ceremonies performed on the BankID Root CA.

All order messages exchanged between the bank/RA and the certification authority system are stored in a permanent archive.

Information to be stored in records in the archive:

- Registration of new subjects;
- Certificate requests;
- Issued Certificates;
- Agreements about certificates and protection of keys and activation data;
- Renewals of certificates and associated messages;
- History of Key Changeovers on the Registration Authority System;
- Invalidation requests (revocation or suspension) with associated messages;
- Historical invalidation and revocation information;
- Current and expired policies and CPSs.

RA are the part with direct customer (subscriber) contact, and responsible to keep the following records:

- The subjects identity, see section 3.2.3
- The subscriber agreement

For Bankenes ID-tjeneste: For the RA-application, cf. section 5.4.1.

For Danske Bank: Danske Bank stores and archive following records

- An electronic copy of the signed agreement in the customer folder.
- All orders between the RA and the issuer system

For DNB: The TSP keeps logs, as described in section 5.4. Current and expired CPS and policies are stored by Bits AS. The issuance and use of OTP mechanisms are logged in the bank. The bank archives current and expired CPS (TSPS).

For Eika: Eika Gruppen stores all confirmed copies of identification documents and signed agreements in a secure and retrievable way for as long as the legal regulations require.

Eika Gruppen copies and stores the following registration information:

- Copy of the original identification document with certain additional information. This copy is then archived at the bank so that it is retrievable.

Eika produces electronic event logs that, among other things, log all status modifications to BankID certificates and various security events.

Eika also has logs attached e.g. to document handling, CA and RA security elements, and various revisions.

Eika has event logs also for reported events.

As issuer of BankID Eika Gruppen owns a CA in BankID COI. In connection with the initial key ceremony and later key ceremonies various keys and other security elements were issued to Eika. These keys and security elements have been delivered to Eika Gruppen's key custodian, so accordingly Eika has in its possession various security elements associated with CA – Eika Gruppen's role as TSP issuing BankID. Each of these security elements is stored safely and any changes in their storage or usage is logged.

For Nordea: No additions.

For SpareBank 1: No additions.

5.5.2 Retention period for archive

Archived are stored for 10 years.

Expired certificates and associated public keys are available for 10 years after expiration. Expired private keys are not archived.

The CRLs issued by the CA is kept in archives for 10 years.

The Certificate Validation Service keeps the revocation status information online at least until the certificates expire. After the certificate expiration, the CRLs are kept archived on media according to Chapter 5.1.6 for at least 10 years. There are 3 copies of the media, 2 kept at the Service providers 2 different locations and 1 at the Issuers location.

Important events during the operation of certification authority systems are stored for a minimum of 10 years. Other items in the audit log are stored for a period between 3 months and 10 years depending on risk-demand assessment. UniCERT signs all database entries with it's own internal CA key, related to Issuing, suspending and revocation of certificates, as well as tasks done in the CAO by an authorized operator.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: In Danske Bank, the logs are kept for the present year + 10 years. The logs are stored securely and may be made available for consultation within a reasonable time.

For DNB: Archived data shall be stored for 10 years. Expired certificates and associated public keys must be available for 10 years. Expired private keys are not archived.

For Eika: All archives are stored according to legal requirements in the BankID regulations or Norwegian law.

All log information is stored according to legal requirements in the BankID regulations or Norwegian law. Logs of status modifications to the certificate are stored for 10 years. Backup are normally also stored for 10 years.

For Nordea: No additions.

For SpareBank 1: No additions.

5.5.3 Protection of archive

For the CA-system and central servers and storage equipment

Only authorised personnel at the Bank, Registration Authority or service provider shall be allowed to read archived data. All archived data is integrity protected.

For Bankenes ID-tjeneste: See 5.4.4.

For Danske Bank: No additions.

For DNB: The requirements for making security copies of archived data are observed. The standard procedures for this are described in the document “BankID - Internal Security Procedures”.

For Eika: Current data records and logs are stored securely in the ICT systems. Eika Gruppen also regularly performs backups of all their data records and electronic event logs for the RA solutions.

Manual logs are stored securely protected, if this is considered necessary.

For Nordea: No additions.

For SpareBank 1: Security requirements for the archiving systems are agreed upon in the service vendor agreement. Accesses are granted and withdrawn according to ordinary access routines.

5.5.4 Archive backup procedures

For the central PKI system, archived data must be written to media suitable for long-term storage.

Two copies of archived electronic information shall be stored, in two different places.

For Bankenes ID-tjeneste: See 5.4.5

For Danske Bank: No additions.

For DNB: The requirements for making security copies of archived data are observed. The standard procedures for this are described in the document “BankID - Internal Security Procedures”.

For Eika: See sub-chapter 5.5.3 – Protection of Archive.

For Nordea: No additions.

For SpareBank 1: Live backups are stored on both data centers.

5.5.5 Requirements for time-stamping of records

Not applicable

5.5.6 Archive collection system (internal or external)

For the CA-system and central servers and storage equipment

The records archival system is internal.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: See sub-chapter 5.5.3 – Protection of Archive.

For Nordea: No additions.

For SpareBank 1: The records archival system is internal.

5.5.7 Procedures to obtain and verify archive information

For the CA-system and central servers and storage equipment

For Bankenes ID-tjeneste: See 5.4.5.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Eika Gruppen's BankID solution is monitored. The logs are constantly available for operators with sufficient right of access.

Eika Gruppen will further retrieve and review event logs as needed. The logs will be reviewed by an operator with sufficient right of access.

Current data records and logs are stored securely in the ICT systems. Eika Gruppen also regularly performs backups of all their data records and electronic event logs for the RA solutions.

Manual logs are stored securely protected, if this is considered necessary.

Only specific employees at the ICT Operations service providers have access to retrieve backup tapes at a later point.

If the TSP terminates, the logs will be preserved in a readable way for as long as Eika Gruppen's legal requirements are still valid.

For Nordea: No additions.

For SpareBank 1: TSP adheres to Norwegian laws regarding confidential information in the Money Laundering Act and the Personal Data Act.

All necessary information registered in the RA system are stored centrally and is independent of any RA going out of business. All information will be kept according to requirements for storage time. Information is secured with access control.

5.6 Key changeover

New Root-CA keys must be generated and a new Root-CA certificate must be issued well before the old Root-CA certificate expires. The old and new Root-CA certificate must coexist in an overlapping period that lasts at least the duration of a Level 1 certificate.

New Level 1 keys shall be generated and a new Level 1 certificate shall be issued well before the old Level 1 certificate expires. The old and new Level 1 certificate must coexist in an overlapping period that lasts at least the duration of the validity period of the end user certificate that has been issued with the longest validity period. More information about key changeover for a Level 1 CA is available in the CP/CPS for BankID Root-CA [16].

Bits AS and the service provider keep a track record of all key validities and organise key generation of Root-CA keys and Level 1 keys well before expiration.

Root CA keys are generated and certified on the Root-CA by reprepresentatives from Bits AS on behalf of Finance Norway.

Level 1 CA keys are generated on the Level-1 CA by representatives from the TSP, and certified on the Root CA by representatives from Bits AS on behalf of Finance Norway.

The following validity periods are defined for BankID:

- Root-CAs keys are valid for 26 years. New keys are generated every 14th year.
- Level-1 keys are valid for 12 years. New keys are generated every 8th year.
- Keys for MerchantBankID are valid for a maximum of 4 years and must be renewed every 4 years.

5.7 Compromise and disaster recovery

5.7.1 Incident and compromise handling procedures

If the private key of a TSP has been compromised, the service provider shall follow the following procedure:

1. BankID certificates from the relevant CA system shall be rendered unusable. There are a number of ways to technically achieve this. The certificate validation service will immediately be notified that this CA is no longer valid. All certificates signed with the issuer's private key will thereafter be declined by the certificate validation service. Root-CA will also revoke the issuer's certificate.
2. Issuers shall immediately inform all Registration Authorities, end users and other issuers of the incident.
3. Key changeover for the issuer shall take place in accordance with the CP/CPS for Root-CA [16];
4. The registration authority must flag all end user certificates issued under the compromised key for renewal. These can no longer be used in the normal way;
5. The issuer produces new certificates in the certification authority system for all its end users who must follow the established routines for renewal. This means that the central storage entity generates keys and that these are certified with the issuer's new key.

Private keys belonging to merchants are stored in an encrypted format, and the merchants are obliged to protect these with strict access controls and authentication processes. It is therefore considered unlikely that a general key compromise situation, where a number of merchants' private keys are affected, will occur.

In case of suspicion that an issuer has been compromised, there are procedures for temporarily withdrawing BankIDs issued by the relevant issuer. If the issuer turns out to have been compromised, the procedure at the top of this section shall be followed.

BankID operations are continually divided between two separate physical locations. If one location is forced to halt operations, e.g. as a result of a natural disaster, BankID operations will continue in the other location. This means the solution is very robust in the face of a number of different disaster situations. Tests must be done on a regular basis to verify that it is possible to run operations from one location. The systems are configured to be able to handle operations from one location for several days, provided traffic loads are normal.

This is covered in the disaster/recovery plan, "BankID Disaster and Recovery plan".

The operator of the CA and central storage entity has deployed ITIL procedures for incident handling, and has on-call personnel to handle issues withing 30 minutes.

Where the breach of security or loss of integrity is likely to adversely affect the subject to whom the trusted service has been provided, the TSP shall also notify the natural or legal person of the breach of security or loss of integrity without undue delay. The breach will be communicated through the TSP´s standard communication channel to the subject.As a result of monitoring the given system, components and logs the TSP has implemented procedures

to handle with any discovered vulnerability in 48h or to create the plan to mitigate the vulnerability or to document the reason why not requiring remediation.Several layers of security and monitoring of security measures combined with procedures is in place to reduce the impact and damage from security incidents and malfunctions.

For Danske Bank: Local IT Managers are part of the incident escalation communication and therefore have possibility and responsibility for reporting and escalating incidents.

The agreed response time for internal technology support for priority 1 cases is within 15 minutes. Priority 2, 3 and 4 cases within 4 hours. However, during working hours this will be likely to be less. In regards to external software suppliers the response time is up to 2 hours.

For SpareBank 1: TSP has a high level crisis management plan for handling all crisis that can arise within the TSP. The plan details escalation, decision making structure and communication with service providers, authorities, third parties and the public in connection with different types of crisis and catastrophic situations.

In case of physical catastrophes, TSP have agreements for catastrophe readiness with service providers and have plans for re-establishing the systems that are operated by TSP.

5.7.2 Computing resources, software, and/or data are corrupted

For the CA-system and central servers and storage equipment

All essential software and information is kept and backed up in a version control system. Any system failures will be restored from this repository. All changes in the production environment are first committed to the version control system before deployed in production.

In the event of a logical disaster, it is possible to roll the system back to the last successful transaction, correct any mistakes and then continue operating the system.

For Bankenes ID-tjeneste: The RAs are aware of procedures for notification of events and consequences and relevant actions to be considered, and have recovery plans covering

- Responsibilities for decisions, and implementations of, mass revocation
- Information and communication to subjects and customers
- Responsibilities for IT and/or BankID Security in general

For Danske Bank: No additions.

For DNB: No additions.

For Eika: All systems data necessary to resume CA and RA operation are backed up regularly and stored safely. Backups are stored under the same security regime as the production environment.

Only qualified personnel at Eika Gruppen and IT Operations service providers are allowed to perform backup and restore functions.

The production environment for Eika Gruppen’s BankID solution is dualised, so that the backup systems will ensure continued operation in cases of disruption.

The physical security for dualised solutions is the same as the security for regular production solutions.

Eika has continuity and disaster recovery plans as part of their banking operations, with a view to maintaining all production systems in a discontinuance situation.

For Nordea: Nordea has Business Continuity Plan in place, where contact details and escalation procedures described in details, including internal Crisis Response Team (CRT) and external notifications to customers, partners, BankID, Bits AS, Finance Norway, Nordic Financial CERT and other relevant instances.

For SpareBank 1: Routines are in place to restore from backup in case of disaster. In case of compromise, restore is done from trusted backup from before compromise.

5.7.3 Entity private key compromise procedures

If there is a breach of security or loss of integrity that has a significant impact on the trust service provided and on the personal data maintained therein, the TSP will notify that appropriate parties in line with the applicable regulatory rules. The National Communications Authority (Nkom) and Norwegian Data Protection Authority if an incident affects personal data of the clients within 24 hours the incident occurs.

For Bankenes ID-tjeneste: Key compromises of RA private keys or BID keys will lead to revocation of Merchant BankIDs and subsequent reissue of certificates. In such cases the RA, BID and Service Providers will:

- Ensure that certificates under the compromised key will be rendered invalid for use
- Prepare for issuance of new certificates
- Report certificates issued under the compromised key for revocation.

After revocation there must be a new issuance of revoked certificates.

For Danske Bank: If a merchant private key is compromised for which Danske Bank is the RA, revocation procedures shall be followed.

For DNB: The TSP guidelines for crisis management and incident management applies

For Eika: Eika has continuity and disaster recovery plans as part of their banking operations, with a view to maintaining all production systems in a discontinuance situation.

Eika Gruppen has developed a continuity and disaster recovery plan for BankID that describes the actions Eika, in the role of CA (Certification Authority), will take in a continuity situation occurring if BankID is compromised. The plan also describes the preparedness Eika has in relation to disasters that can strike their BankID. The plan further deals with how Eika Gruppen and user banks will perform measures associated with the individual banks' role as RA (Registration Authority) under Eika's CA.

This plan address any compromise, loss or suspected compromise of a CA's private key as a disaster.

For Nordea: No additions.

For SpareBank 1: No additions.

For the subject

Private keys belonging to merchants are stored in an encrypted format, and the merchants are obliged to protect these with strict access controls and authentication processes. It is therefore considered unlikely that a general key compromise situation, where a number of merchants' private keys are affected, will occur.

If one merchant private key is compromised, revocation procedures shall be followed.

5.7.4 Business continuity capabilities after a disaster

Vipps AS has a Business continuity and crisis plan known to all parties in the value chain. This plan covers the crisis management, participants, roles and responsibilities, action and communication plan. The crisis management team´s responsibility is to cover extraordinary incidents, crisis and disaster. Represented in the crisis team are all banks and banking groups, Finance Norway and Bits AS.

Annually exercises for crisis and disaster is conducted in order to prepare the management and organisation for extraordinary incidents, crisis and disaster. Every such exercise or extraordinary incidents are handled according to the Business continuity and disaster recovery plan.

After every exercise or extraordinary incidents there is written a post mortem report to be used for improving the parts or issues that was identified to be causing the incident or crisis. Every improvement task is given a due date and a responsible person to follow-up and implement the change (improvement). This post mortem report ate important to continually improve the ability to handle such an incident, capacity issues, technical, communication or organisational challenges.

Annual disaster recovery test are conducted on the technical infrastructure to verify that disaster recovery plan, procedures and backup is working like it is supposed to.

For Bankenes ID-tjeneste: Procedures are in place to restore from backup in case of disaster. In case of compromise, restore is done from trusted backup from before compromise.

See 5.7.2.

For Danske Bank:

- As soon as Danske Bank is made aware, via internal or external channels, about a disaster (e.g. CA certificate may be compromised). an employee from Group Service Centre department creates an incident with the priority 'critical' in Danske Bank's incident management system
- Danske Bank suspends its CA certificate at the BankID COI Operator. When Danske Bank's CA certificate is blocked, no BankID certificates issued by Danske Bank can be used at its own or others' BankID user locations.
- Danske Nettbank will not be running, customers is advice to use the Mobile Banking solution,
- Danske Bank's customers are informed via the proper channels.
- A root cause analysis is initiated.
- The establishment of a new CA certificate is implemented.
- Danske Bank's customers are informed.
- New BankIDs are created for all of the bank's sites
- Danske Nettbank returns to ordinary operation.
- Customers can use the 'BankID administration' service on Danske Bank's website to create a new BankID.

Several of these processes will take place in parallel to achieve the fastest possible reaction time

For DNB: No additions.

For Eika: Eika has continuity and disaster recovery plans as part of their banking operations, with a view to maintaining all production systems in a discontinuance situation.

Eika Gruppen has developed a continuity and disaster recovery plan for BankID that describes the actions Eika, in the role of CA (Certification Authority), will take in a continuity situation occurring if BankID is compromised. The plan also describes the preparedness Eika has in relation to disasters that can strike their BankID. The plan further deals with how Eika Gruppen and user banks will perform measures associated with the individual banks' role as RA (Registration Authority) under Eika's CA.

When it comes to technical operation with appurtenant catastrophe handling associated with re-establishing software and hardware and restoring data, both Eika and the bank's service provider for IT operations has

established continuity plans. Actions in connection with this are also incorporated into the agreement between the parties.

The continuity plan for BankID in Eika Gruppen covers, among other things, the following aspects relating to a disaster situation.

- Criteria for implementation of a continuity plan.
- Roles and distribution of responsibility within Eika Gruppen.
- Order of execution for relevant measures.
- Communication with internal resources, individual banks, and service providers.
- External communication with customers, other banks and bank groups, and trade organisations.
- Establishing corrective measures to the BankID solution.
- A retrospective analysis of the situation with potential improving changes to the disaster recovery plan.

Banks affiliated with Eika Gruppen afflicted by a disaster situation will then publish a declaration about the event to their customers

If Eika Gruppen or the individual bank's private key is compromised, Eika will perform relevant necessary tasks to inform the affected parties about the situation and to make sure affected certificates are no longer to be accepted.

For Nordea: No additions.

For SpareBank 1: Routines are in place to restore from backup in case of disaster. In case of compromise, restore is done from trusted backup from before compromise.

5.8 CA or RA termination

In this context, Certificate Issuer Termination refers to a situation where all logical functions related to issuance of BankIDs are permanently terminated. A Key Changeover is not a termination.

The terms below apply when the issuer of BankID ceases operation in a controlled manner and has time to notify contacts of what is about to happen. The terms do not apply in emergency situations.

Before an issuer of BankID terminates their services, it shall:

- Inform the owner of the parent CA (BankID root-CA) about the planned termination at least 6 months in advance;
- Inform the bank's customers (subjects, relying parties, subscribers) and other issuers of BankID at least 6 months in advance;
- Publish information of the planned termination at least 3 months in advance;
- Ensure that all relevant databases, archives and documents are kept in accordance with this document, for the defined retention period see section 5.4.3.
- Ensure that revocation status of the issued certificates is available on the Certificate validation service until the CA shuts down.
- Ensure the TSP's public key or its trust service tokens to relying parties are available for a reasonable period.

A TSP must also ensure that RA-banks that use its services receive the necessary information to move to another TSP.

The banking industry has prepared procedures that shall be followed if a participating bank or registration authority goes into administration, including transfer of the TSP obligations to other parties, see BankID Rules article 17. Bits AS may invalidate the TSP's CA certificate, thereby invalidating all subscriber certificates issued by the TSP. If the TSP enters into administration, bankruptcy or is subject to other insolvency proceedings, Bits AS may, at the request of the Norwegian Bank's Guarantee Fund, decide to postpone invalidating BankIDs issued by the relevant participant to natural persons, for up to three months. The Norwegian Banks' Guarantee Fund must

then assume the participant's obligations and duties as issuer, including the liability arising from the Electronic Signatures Act and BankID Rules.

If a bank acting as RA wishes to terminate its relationship with a TSP and intends to start issuing certificates via another TSP, the old certificates remain valid until they reach their expiration date unless they are revoked.

The relationship between the bank acting as RA and the TSP can therefore not be terminated until all certificates have expired or been revoked. The parties' responsibilities under the agreement do not change during this period.

The operator of the CA and central storage entity has established operational procedures for termination of CAs, called "Termination of CAs"

The operator of the CA and central storage entity has operational procedures for offline backup of Level 1 CA. These procedures covers the BankID COI Operator' part of the termination procedures.

For Bankenes ID-tjeneste: Procedures and agreements between BID and RA ensures this. The RAs have issued a guarantee of indemnity for financial responsibilities in these situations. Data and logs will be archived according to requirements in BankID Rules, and will be available for banks if they convert to other Issuers and Service Providers.

BID as Joint Issuer will not be terminated as long as there are banks with active certificates issue by BID. Cf. also Termination Plan.

For Danske Bank: For the RA-system: Termination refers to a situation where permanent closure happens to all logical functions related to Danske Bank acting as RA for the issuance of BankIDs

Before Danske Bank terminates its service as a RA, it shall:

- Inform the owner of the parent CA (BankID root-CA) about the planned termination at least 6 months in advance;
- Inform the bank's customers (subjects, relying parties, subscribers) and other issuers of BankID at least 6 months in advance;
- Publish information of the planned termination at least 3 months in advance;
- Ensure that all relevant databases, archives and documents are kept in accordance with the TSPS document, CP and CPS.

Danske Bank would also ensure that any other banks that use its RA services receive the necessary information to move to another TSP.

The terms above apply when Danske Bank ceases operation in a controlled manner and has time to notify contacts of what is about to happen. The terms do not apply in emergencies.

For DNB: The TSP's IT Continuity and Disaster Recovery Plan is the overarching tool for managing situations that result in severe reductions of the service level and the delivery of IT services in the TSP. The IT Continuity and Disaster Recovery unit is part of a four-part continuity and disaster recovery management organization in the TSP. The Disaster Management team for IT outages in the banking operations (Bank crisis management) is the strategic management team during crises of a grave and/or enduring nature. The IT Continuity and Disaster Recovery team is the bank's operative disaster management team in the event of a full outage or strong reduction of IT operations. The head of IT serves as the liaison with the affected business and support areas and their continuity management teams. The individual business and support areas have their own continuity organizations and continuity plans that focus on business continuity, i.e. continuing production using available solutions, including backup operation system solutions as well as manual solutions. The Group Emergency Preparedness Management takes precedence over the bank's Disaster Management Team in the event of IT outages in the banking operations.

The emergency preparedness management team largely deals with disasters entailing a risk to life and limb and is responsible for coordinating efforts on the Group level.

The disaster recovery plan are documented in "Disaster recovery plan for compromised CA-Keys of BankID"

For Eika: Eika Gruppen has an up-to-date termination plan that applies when Eika Gruppen as issuer of BankID ceases operation in a controlled manner and has time to notify contacts about what is about to happen. The plan do not apply in emergency situations.

Before Eika Gruppen as issuer of BankID, or a bank issuing BankID under Eika as TSP, terminates its services in a controlled manner, Eika will:

- Inform the owner of the parent CA (BankID root-CA) about the planned termination at least 6 months in advance.
- Inform the subjects, relying parties and other issuers of BankID at least 6 months in advance.
- Publish information of the planned termination at least 3 months in advance.
- Ensure that all relevant databases, archives, and documents are kept in accordance with CP and TSPS.
- Ensure that all Eika Gruppen's private keys, including backup copies, are destroyed, or withdrawn from use, in a manner such that the private keys cannot be retrieved
- Make arrangements to transfer provision of trust services for its existing customers for a limited period of time to another TSP where relevant and possible.

Eika does not outsource any functions relating to the process of issuing trust service tokens, so no notification regarding this is necessary.

Eika Gruppen will also ensure that banks that use its services receive the necessary information to move to another issuer of BankID, in case of a controlled change of issuer.

For Nordea: The service provider shall back up all data and enable storage for at least 10 years in an archive that is readable in accordance with the requirements in Chapter 4.6.

For SpareBank 1: TSP Termination Plan will be used in the event of an RA or CA termination.

6 Technical security controls

6.1 Key pair generation and installation

All certification authority systems use FIPS 140 [2] level 3/4 evaluated HSM for all cryptographic functions.

All central infrastructure and central storage entity components that handle BankID private keys also use HSM.

6.1.1 Key pair generation

CA key pair generation

Root CA:

Root CA Key Ceremony is conducted by at least a System Administrator for the Common Operational Infrastructure (COI) issuing the commands, a Key Custodian from Finance Norway (Bits AS personnel is appointed by Finance Norway to this role) and a person in Trusted Role from the COI Operator acting as Key Custodian and Supervisor and an external auditor.

The Root CA credentials is split between COI Operator and Bits AS personnel, so that none of the parties may start the Root CA or reproduce the Root CA HSM without the other party. The Root CA HSM is switched off when not in use.

The BankID COI Operator is responsible for testing and documenting the Root CA Key Ceremony. The Root CA Key Ceremony document details all commands conducted during the Key Ceremony and is approved by the Security Officer before the Key Ceremony.

All 4 participants of the Root CA Key Ceremony signs 3 copies of the Root CA Key Ceremony document and confirms that the procedure is followed and that the integrity and confidentiality of the Root CA keys is ensured. The System Administrator, Key Custodian for Finance Norway and the Security Officer safekeeps one copy each of the signed evidence.

Level 1 CA:

Level 1 CA Key Ceremony is conducted by at least a System Administrator for the Common Operational Infrastructure (COI) issuing the commands, a Key Custodian from the Issuer and a Security Officer from Vipps AS acting as Key Custodian and Supervisor.

The Level 1 CA credentials is split between and a person in Trusted Role from the COI Operator and the Issuers Key Custodian, so that none of the parties may reproduce the Level 1 CA HSM without the other party. The Level 1 CA HSM is placed in an online state, ready for issuing Subject certificates.

The BankID COI Operator is responsible for testing and documenting the Level 1 CA Key Ceremony. The Level 1 CA Key Ceremony document details all commands conducted during the Key Ceremony and is approved by the Security Officer before the Key Ceremony.

All 3 participants of the Level 1 CA Key Ceremony signs 3 copies of the Level 1 CA Key Ceremony document and confirms that the procedure is followed and that the integrity and confidentiality of the Level 1 CA keys is ensured. The System Administrator, Key Custodian for Issuer and the Security Officer safekeeps one copy each of the signed evidence.

When the Level 1 CA keys are created, the System Administrator for COI, the Key Custodian for Finance Norway (Bits AS) and the Security Officer will certify the Level 1 CA on the Root CA according to stringent procedures for starting, issuing and stopping the Root CA. The Key Custodian from the Issuer will confirm that the Level 1 CA certificate information elements is correct under this process.

A new CA certificate for signing subject keys will be made in time for all entities who rely on the certificate to update their certificate before the old expires. The general rule for updating the CA certificates is before the longest living certificates issued by the CA which is 4 years.

RA key par generation

The RA key pair used to encrypt the communication between the bank RA servers at the TSP RA service provider and the CA-system service provider is generated by the CA software and exported as a file.

The RA key pair used to sign the RA messages at the bank RA servers is generated in a HSM at the TSP RA service provider. The public signing key is certified at the TSP CA by representatives from the TSP and Bits AS acting on behalf of Finance Norway.

For Bankenes ID-tjeneste: The RAs keys for secure communication with COI are generated by BIDs level-1 CA in a Key ceremony. The keys are securely transported to the RA Application Provider and installed in the RAs RA-Application.

Key Ceremony for the RA keys are performed with a representative from the RA, or somebody acting on part of the RA under written authority. The process is logged and archived and keys installed in HSMs and safely stored.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: The key pairs are delivered to Eika Gruppen's Key Custodian by personal attendance in connection with the completed key ceremony.

As issuer of BankID in the BankID Partnership, Eika Gruppen owns a CA in BankID COI. In connection with this, an initial key ceremony has been performed. Eika's CA was then established in BankID COI, and various keys and other security elements were issued to Eika. These were security elements associated with the group's CA.

In the aftermath, key ceremonies have also been performed associated with Eika Gruppen's CA in BankID COI whenever needed.

During initial and subsequent key ceremonies for Eika Gruppen's CA in BankID COI, various security elements associated with CA and RA functions, have been issued. Security elements in Eika's possession are stored under secure conditions with access limited to key custodians.

For Nordea: No additions.

For SpareBank 1: The RA key pair is generated on HSM.

Enduser key pair generation

Key pairs are generated in a secure environment under the sole control of the enterprise. The secure environment may either be a dedicated HSM or a secure operating environment.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: The RA key pair used to encrypt the communication between the bank RA servers at the TSP RA service provider and the CA-system service provider is generated by the CA software and exported as a file.

The RA key pair used to sign the RA messages at the bank RA servers is generated in a HSM at the TSP RA service provider. The public signing key is certified at the TSP CA by representatives from the TSP and Bits AS acting on behalf of Finance Norway.

For DNB: The TSP's keys are issued through the issuer system the RA uses to issue certificates. The material for the key is provided to the bank when the subject goes to the bank in person after the root key ceremony has been completed.

For Eika: The key pairs are delivered to Eika Gruppen's Key Custodian by personal attendance in connection with the completed key ceremony.

In connection with Eika Gruppen's CA in BankID COI, RA issuances have been made to make BankID COI and Eika's CA accessible to the individual banks affiliated with Eika's BankID solution. This entails that one or more Registration Authority (RA) has been established under the group's CA on these occasions. In connection with this, security elements associated with RA have been issued. These security elements were delivered to Eika Gruppen's key custodian, so accordingly Eika has in its possession various security elements associated with RA. They too are stored under secure conditions with access limited to key custodians.

For Nordea: The registration authority's key pair is issued on the certification authority system on which the registry shall issue certificates and distributed to the registration authority in a secure manner. This is described in [4]. Nordea has internally procedures and routines for handling the RA password, how it is stored and how to access the encrypted secret. A key custodian is designated to distribute and load keys or key splits into a cryptographic module.

For SpareBank 1: No additions.

6.1.2 Private key delivery to subscriber

There is no delivery of the private key to the Merchant, since the keys are generated locally at the Merchant.

6.1.3 Public key delivery to certificate issuer

File-based MerchantBankID: The Authorised BankID software submits a public key to the issuer for certification by the issuer via an encrypted channel.

HSM-based MerchantBankID: The Authorised BankID software, which communicates with the HSM, submits a public key for certification by the issuer via an encrypted channel.

Within the BankID central storage entity, the end user's public key is protected in the same way as other production data within the secure zone. In practical terms, this involves both integrity protection and encrypted connections between different components.

6.1.4 CA public key delivery to relying parties

The public key for a BankID certificate issuer will be found in a certificate issued by the BankID root-CA (ref Chapter 1.3.1). The main rule is that BankID certificate issuers are responsible for making a valid CA level 1-certificate available, so that this certificate can be used by authorised certificate validation services.

All BankID transactions, whether authentication or signing will result in a data structure containing the end-user certificate and the CA-certificate. All Relying parties are provided access to the Root CA certificate as part of the installation of the BankID software. The Certification chain is always validated for every transaction.

The Root-CA certificate and public keys for BankID certificate issuers will be distributed to parties which need access to them. It is not considered necessary to distribute these keys to all relying parties, because a relying party will always communicate with an authorised certificate validation service to verify the validity of a certificate. Relying parties will hence only need to have the public key for the certificate validation service. The certificate validation service will in turn be responsible for current and correct access to all certificate issuers' public keys.

Delivery of new CA certificates replacing expiring CA certificates is handled in the same way as initial CA certificate above.

6.1.5 Key sizes

The key size for root-CA and level-1 is 4096 bits for RSA.

The key size for the Registration Authority is 2048 bits for RSA.

The key size for a Merchant BankID certificate is 2048 bits for RSA.

6.1.6 Public key parameters generation and quality checking

File-based MerchantBankID: The Authorised BankID software generates a public key.

HSM-based MerchantBankID: The HSM generates the public key according to a request from the Authorised BankID software.

6.1.7 Key usage purposes (as per X.509 v3 key usage field)

BankID has different key pairs for authentication and signing.

For authentication certificates; DigitalSignature(0)/KeyAgreement(4) is used.

For signing certificates; Non-repudiation(1) is used.

6.2 Private Key Protection and Cryptographic Module Engineering Controls

6.2.1 Cryptographic module standards and controls

For CA-systems

TSP private keys are stored in a FIPS 140, level 3/4 [2] certified HSM, and it is not possible to export these from the HSM as plain text. To export a backup of a CA's private key the requirement is that the key must be encrypted and divided into parts that are distributed between two or more physical components.

Appropriate security controls are in place for the management of any cryptographic keys and any cryptographic devices throughout their lifecycle. In internal security procedures documentation for security control are described.

The HSM are packed and sealed by the manufacturer and System Administrators in COI will follow a written unboxing routine for checking the seal and serial number.

Transportation of HSM follows routines for Transportation of equipment, controlled and accompanied by 2 System Administrators.

Uninstalled HSM are stored in the same protected area as the Production HSM.

CA Signing keys are only used for issuing certificates, signing revocation requests and issuing CRL.

For RA-systems

For Bankenes ID-tjeneste: RA system Suppliers store certain elements within a HSM.

For Danske Bank: In Danske Bank, the access to crypto facilities, functions, keys, etc. involves two people entering the crypto room together, and two people logging in and operating the crypto equipment together.

Crypto equipment is located in physically locked premises that require two key officers together. Logical access to the crypto function requires two key officers together. Key generation always requires two key officers together. The administration of keys are always logged.

For DNB:

For Eika: Eika Gruppen uses commonly accepted crypthographic techniques and algorithms for protecting any keys and similar devices. Furthermore Eika Gruppen stores certain elements protected inside a Hardware Security Module (HSM).

During initial and subsequent key ceremonies for Eika Gruppen's CA in BankID COI, various security elements associated with CA and RA functions, have been issued. Security elements in Eika's possession are stored under secure conditions with access limited to key custodians.

The service provider for BankID COI has dedicated routines for key destruction, and Eika Gruppen has routines for following up the service provider in such cases and verifying that all keys are destroyed and removed from the production HSM.

Eika Gruppen has appointed a key custodian who will accompany security officers from the service provider for BankID COI in performing this task.

For Nordea: No additions.

For SpareBank 1: RA HSMs are certified in accordance with FIPS 140 level 3 / 4.

For end users as subjects

A MerchantBankID shall be stored as following:

File-based MerchantBankID:

The keys may be stored in software. Private keys must be stored in a logically separated and secured data unit, the key file. The key file shall be password protected using a password with the following characteristics:

- The password shall be chosen by the formal or technical representative of the legal person, as defined in Chapter 3.1.5;
- The password shall only be changed by the individuals listed i the previous paragraph;
- The password shall have a minimum of 7 characters, not all of which can be letters;
- The password may be very long.

HSM-based MerchantBankID:

The keys shall be stored in a HSM and never leave the HSM as plain text. The HSM must comply with the requirements in this document. Any passwords used to initiate the HSM or protect keys in the HSM must comply with the rules outlined above.

6.2.2 Private key (n out of m) multi-person control

For CA-systems

Any access to the system that holds the issuer's private keys requires the involvement of at least two individuals. This means that no single person will have all the information required to access the environment where the private key is stored.

The issuer’s service provider is in full control of all the HSM devices during all phases of the HSM device’s "life cycle", and has procedures in place to safeguard the integrity of the device from transportation and storage through initiation and use to controlled removal or destruction of secret keys when the device is decommissioned.

A subject's private key shall only be available for use by the subject. No-one employed by the central storage facility or issuers of BankID have access to either use or read the subject's keys in plain text. The subject's keys is protected by firewalls and other network security (against external attacks) and with several levels of cryptography (against external and internal attacks.)

For RA-systems

Registration Authorities operation is with single-person control.

For Bankenes ID-tjeneste: Secure elements in BIDs possession are stored under secure conditions with access controlled by Key Custodian.

For Danske Bank: In Danske Bank, the access to crypto facilities, functions, keys, etc. involves two people entering the crypto room together, and two people logging in and operating the crypto equipment together.

Crypto equipment is located in physically locked premises that require two key officers together. Logical access to the crypto function requires two key officers together. Key generation always requires two key officers together. The administration of keys must be logged.

For DNB: No additions.

For Eika: During initial and subsequent key ceremonies for Eika Gruppen’s CA in BankID COI, various security elements associated with CA and RA functions, have been issued. Security elements in Eika’s possession are stored under secure conditions with access limited to key custodians.

For Nordea: No additions.

For SpareBank 1: Any access to the system that holds the Registration Authority's private keys requires the involvement of at least two individuals. This means that no single person will have all the information required to access the environment where the private key is stored.

For end users as subjects

Natural persons who are subjects, operation is with single-person control.

6.2.3 Private key escrow

There is no private key escrow in BankID.

6.2.4 Private key backup

The Merchants generate and stores their keys themselves and handles backup within the organisation.

For CA-systems

A backup of private keys must be done for Level-1-CAs. All Certification Authority Systems must be recoverable in case of operational issues. This includes the recovery of secret key values in HSM. Key material shall never be exported in plain text, but under a key encryption key (KEK).

Backups of key material shall be divided into at least two components. Neither component shall contain enough information about the key material to be used on its own. The different components shall be distributed to trusted individuals in different organisations. Both organisations have to be present to assemble the data.

KEK must be split into two parts as well, and each key custodian is responsible for one of the parts.

For RA-systems

For Bankenes ID-tjeneste: RA Private keys are stored in HSMs at dispersed locations.

For Danske Bank: The TSP stores RA signing keys in several HSMs runing active, in geographically dispersed locations. So the HSMs backup each other.

For DNB: The separate standard procedure for dealing with security copies of private keys is set out in an internal document describing the rules for managing BankID keys.

For Eika: See sub-chapter 6.2.1 – Cryptographic module standards and controls.

For Nordea: No additions.

For SpareBank 1: RA Private keys are backed up as cryptograms. The KEK is split and 2 of 3 types of personnel is required.

For end users as subjects

For File-based MerchantBankIDs, keys are stored in a protected file. Copies of this file may be taken. The organisation is responsible for secure storage of the file and associated password.

For HSM-based MerchantBankIDs, HSM features for key backup and export may be used. The security and quality of these features shall be documented.

6.2.5 Private key archival

Private keys are not archived. The Merchant keys are handled locally by the Merchants.

6.2.6 Private key transfer into or from a cryptographic module

For CA-systems

Private keys for the TSP is backed up for recovery purposes. All certification authority systems are recoverable, including all key values stored in the system's HSM. Exports of key materials for recovery purposes are performed with a key encryption key, which is divided into two components and never stored in plain text. Knowledge of one component will not provide information about the entire key. Restoring a private key requires all key encryption components to be present. The TSP key encryption key is divided into two parts, where each key custodian is responsible for one of the key parts.

The private key of the subject is encrypted with several layers of sequential encryption based on public keys corresponding to private keys generated and held by dedicated HSMs evaluated according to FIPS 140 level 3/4.

For end-users as subjects

HSM-based MerchantBankIDs shall always be restored by importing the key into the HSM as a cryptogram.

6.2.7 Private key storage on cryptographic module

For CA systems

TSP private keys on the Certification Authority System are generated within a cryptographic module (HSM). If it becomes necessary to restore this, it will arrive as a cryptogram, encrypted using a KEK.

Multi-personnel control by means of n-of-m HSM cards is required to load and activate the keys into the HSM. The sensory controller of the HSM can, in a case of an alarm, delete or render useless the key material in the HSM.

For RA systems

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: See sub-chapter 6.2.1 – Cryptographic module standards and controls.

For Nordea: No additions.

For SpareBank 1: TSP private keys on the Registration Authority System are generated and kept within a cryptographic module (HSM). If it becomes necessary to restore this, it will arrive as a cryptogram, encrypted using a KEK.

For end users as subjects

For HSM-based MerchantBankIDs, the subject's private keys are generated and used within a secure environment. The private key never leaves the secure environment.

6.2.8 Method of activating private key

The CA private key

The TSP private key is protected against disclosure and unauthorised use. This key can only be accessed by algorithmic features within the HSM. Only personnel from the issuer can activate the private key.

The subject private key

File-based MerchantBankID: The key file must be protected so that anyone trying to access the keys has to have the correct password. All the private keys in one key file may be protected by one password.

HSM-based MerchantBankID: There is no requirement to close or deactivate the key store. The Key store may be active and accessible for legitimate use as long as the session between the HSM and the relevant application is active.

6.2.9 Method of deactivating private key

The TSP private key is deactivated by closing the session from the certification authority system to the HSM.

File-based MerchantBankID: The merchant's private key is deactivated by closing the process that uses the private key on the merchant site.

HSM-based MerchantBankID: The merchant's private key is deactivated by closing the session from the merchant application to the HSM.

6.2.10 Method of destroying private key

When the TSP private key is no longer valid, it must be securely removed from the HSM. All parts of backups of the key must also be destroyed. This is the responsibility of the key custodian. Key management for CAs is described in Chapter 4.16 in [4].

File-based MerchantBankID: Secure deletion of the key file (and any backups) will destroy the private keys.

HSM-based MerchantBankID: The mechanisms for key deletion in the HSM will destroy the private keys. Any backups on smart cards etc. must be physically destroyed.

6.2.11 Cryptographic Module Rating

Key generation is made in Hardware Security Modules with FIPS level 140-2 level 3 and FIPS level 140-2 level 4. Private keys never leaves HSMs unencrypted.

6.3 Other aspects of key pair management

6.3.1 Public key archival

All public keys are archived by the issuer for a minimum of 10 years.

Archived public key information for end users are protected in the same way as public key production data on the central storage entity.

Public keys are archived for subsequent verification of signatures.

6.3.2 Certificate operational periods and key pair usage periods

A level 1 CA key pair has a life span of 12 years.

A key pair for a MerchantBankID has a maximum life span of four years.

The certificate of corresponding public keys shall be valid for the same period of time.

6.4 Activation data

6.4.1 Activation data generation and installation

File-based MerchantBankID: The subject's activation data consists of a password chosen by the subject.

HSM-based MerchantBankID: The subject's activation data consists of a password chosen by the subject, a PIN code or similar.

6.4.2 Activation data protection

The subject chooses his own static password in accordance with BankID password rules.

The enterprise is responsible for physical and logical security for the activation data. Further advice about this is available in [22].

6.4.3 Other aspects of activation data

Not applicable

6.5 Computer security controls

6.5.1 Specific computer security technical requirements

All unnecessary features are deactivated on the Certification Authority System and RA's systems. The latter includes both the bank's RA system and service provider devices that communicate with these for the purpose of issuing BankIDs.

There is authentication, access control and traceability down to the individual level across all operations and transactions that affect the use of the level 1-CA's private key. Distinction must be made between the roles defined in Chapter 5.2.1.

The CA system system login requires a username and password, and the password must consist of at least 8 characters. Every person who logs on to the system has his/her own account.

Central storage devices are hardened by turning off unnecessary functionality, at the same level as the certificate issuing devices.

The central storage entity function that handles secret keys is protected by the same type of access control, confidentiality and integrity as the certification authority systems. This also applies to the certificate validation service.

The devices that run certificate validation checks are behind several layers of firewalls and are subject to access control that requires two persons in different roles to be present to perform sensitive operations.

All production data related to certificate issuance or operation of central storage entities are stored on storage entities that are protected against errors or loss of data.

All access to the systems is handled through the access control system, as well as routines for access to secured rooms. Only certified personell have access to the data inside the security rooms. Employees are only granted for access to information on a job related "need to know basis".

Certificate Status Service

The BankID Certificate status service is protected by the OCSP-protocol as described in chapter 6.7. The database in which the certificate status information is stored, is kept in secure premises with dual access control and only available for the Certificate status service as Read-only. To physically access the database, 2 persons in Trusted roles must be present.

CRL's which is used for later proof of validity is protected the same way.

Anti-malware protection

Anti-virus/malware system are installed to protect the integrity of TSP systems and information against viruses, malicious and unauthorised software.

Dissemination service

Dissemination of the Merchants certificate is done according to the secure enrolment process described in chapter 4.1.2.

For Bankenes ID-tjeneste: All data related to BankID registration and issuance is protected through commonly accepted technical and procedural security measures.

For Danske Bank: Danske Bank sets protection from malicious software to be integral part of workstations and servers builds. This includes anti-virus, firewall and HIPS components, those are centrally managed, updated and protected from service shutdown. Antivirus protection works in on-access mode and in addition scheduled forced scans occur on regular basis. Central reporting gathers all anti-virus alerts, whose are being 24/7 monitored via SIEM integration by Security Operation Centre. In addition to that antivirus deployments (antivirus agents) are constantly monitored by central system monitoring system for the service status and definitions versions. Threat intelligence information is used as part of control review process.

Network–based controls: Internet access control web proxy is used to filter URLs; for messaging services protection E-mail security gateway is used.

Spear phishing is controlled by business procedure for central phishing reporting and takedown services.

A layered system protecting against malware is in place and monitored by Danske Banks Security Operation Center 24/7. This consists of elements in the perimeter, on servers and on workstation. IDS/IPS-systems monitor, log, and send alarms in case of signs on infections e.g. when nodes on the intranet contact known C&C-servers on the internet.

Certain categories and specific sites are blocked including data sharing sites. Web email and Internet chat sites are not blocked as categories.

Danske Bank makes use of private networks, TLS, and VPN connections based on risk assessments. Staff is inctrusted to encrypt attachments to emails when needed. BitLocker is used for hard disk encryption for laptops.

All systems are subject to security assessments during the development and significant changes. Vulnerability scanning is performed on quarterly basis and penetration testing is performed on a regular basis.

It is part of the normal IT process in Danske Bank not to use this type of media. However, the use of USB is not blocked. Any use of this media is managed via SOP.

For DNB: No additions.

For Eika: Eika Gruppen protects all data information related to BankID registration and issuance. This is achieved through commonly accepted technical security measures combined with thorough operational routines.

For Nordea: No additions.

For SpareBank 1: Unnecessary features are deactivated on the RA's systems.

There is authentication, access control and traceability down to the individual level.

The RA system login requires a username and password, and the password has complexity requirements. Every person who logs on to the system has his/her own account.

The RA servers are behind several layers of firewalls and the HSMs are subject to access control that requires two persons in different roles to be present to perform sensitive operations.

All production data related to certificate issuance are stored on storage entities that are protected against errors or loss of data.

6.5.2 Computer security rating

For the CA-system and central storage entity

The BankID COI Operator Security Framework contains security requirements to be followed during the design and requirement specification stage, to ensure that the security is built into the system.

For RA-systems

For Bankenes ID-tjeneste: No additions.

For Danske Bank: Danske Bank benchmarks its IT security framework and management system to the ISO 27001:2013 standard. This is done with assurance from external providers, who are specialists in the field, e.g. Verizon and TrustWave

For DNB: No additions.

For Eika: Eika Gruppen protects all data information related to BankID registration and issuance. This is achieved through commonly accepted technical security measures combined with thorough operational routines.

For Nordea: No additions.

For SpareBank 1: No stipulation.

6.6 Life cycle technical controls

6.6.1 System development controls

For the CA-system and the central storage entity

Software development for CA-Systems and the central storage entity is performed in a controlled environment that, together with at least one of the underlying conditions, may protect against software or version control errors:

a) The software vendor must work within a quality system that complies with international standards; or
b) The software vendor shall have a quality system available for inspection on request.

Software used for issuing BankID must be verified to ensure it is genuine and as it was provided by the supplier.

The requirements listed above shall also apply to critical components of the Security Channel.

The service provider of the CA-system and the central storage entity is certified in accordance with the ISO 27001 Standard [6] and all system development is performed in accordance with this standard. All third party software has a security evaluation in accordance with the corresponding standard [International Standards]

The operator of the CA and central storage entity has deployed a quality system that comply with relevant ISO 9000 standards.

The service provider has established procedures for release and change handling according to ITIL principles. All processes are documented by written reports during test and documented in the ITIL tool for all changes. All changes are documented before application.

The operator shall monitor capacity demands and project future capacity requirements to ensure adequate processing power and storage are available.

For the RA-system

Software development for Registration Authorities is performed in a controlled environment that, together with at least one of the underlying conditions, protects against software or version control errors:

a) The software vendor must work within a quality system that complies with international standards; or
b) The software vendor shall have a quality system available for inspection on request.

For Bankenes ID-tjeneste: Service Providers are declared at Bits AS according to Bits ASs regulations and has documented quality systems to ensure release and change handling according to recognized principles and practices.

For Danske Bank: It Governance and Portfolie management are following the proceses described at internal pages of the Bank. Change management procedures are in place that ensures that all changes are documented and approved with the appropriate risk assessment as well as fall back plan. TSP system and information are protected aganst viruses, malicious and unauthorized software.

For DNB: No additions.

For Eika: Eika has a Change Management process applying to all changes in all software in the company group. This outlines the change process in a given number of different processes, and also defines various roles with responsibility for the various processes.

Eika Gruppen uses common accepted security techniques when developing systems.

For Nordea: No additions.

For SpareBank 1: No additions.

6.6.2 Security management controls

The service provider of the CA and the central storage entity has implemented a security framework for policy and procedures.

The service provider has policy and procedures for applying security patches within a reasonable time after they come available, security patches are not applied if they introduce additional vulnerabilities or instabilities that outweigh the benefits of applying them, and the reasons for not applying any security patches are documented.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: Danske Bank systems are operated in compliance with the ITIL standard. There is a media handling policy in place and all media handling procedures should be alligned with it.

For DNB: No additions.

For Eika: All production equipment are placed in a secured environment with multiple layers of physical and logical security.

The server halls are furthermore dimensioned to resist serious and long-term unforeseen events that can lead to disruption.

Backup are contained in these data halls or in secured external locations.

For Nordea: No additions.

For SpareBank 1: TSP Security management is done according to requirements, routines and procedures set forth in the Information Security Management System.

6.6.3 Life cycle security controls

No stipulation.

For Bankenes ID-tjeneste: No additions.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: Eika has a Change Management process applying to all changes in all software in the company group. This outlines the change process in a given number of different processes, and also defines various roles with responsibility for the various processes.

For Nordea: No additions.

For SpareBank 1: The TSP is in full control of all HSM devices during all phases of the HSM's "life cycle", and makes sure that the integrity of the device is safeguarded throughout, from transportation and storage through initiation and use to controlled removal or destruction of secret keys when the device is decommissioned.

6.7 Network security controls

The infrastructure for the CA system and central storage, is segmented into networks or zones based on security classification considering functional, logical, and physical (including location) relationship between trustworthy systems and services. The same security controls applies to all systems co-located in the same zone.

There are separated zones for development, test, pre-production and production systems, in addition there is a dedicated network for administration of IT systems. Dedicated systems are used for administration of the security policy implementation and not used for other purposes.

There is established trusted secure communication channels within the central infrastructure and between the central infrastructure and the distributed RAs, these channels are logically distinct from other communication channels and provide assured identification of its end points and protection of the channel data from modification or disclosure. The external network connections is redundant to ensure availability of the services in case of a single failure.

This TSPS covers network security for the outer firewalls at the service provider and central storage entity.

The root-CA is not connected to the network, and turned off. The root-CA is only started when needed.

The local network components are located in the security rooms.Configuration compliance on new platform are performed regularly. Configuration of network components are audited on a regular basis.

The certification authority systems are protected by multiple layers of firewall and cannot be accessed directly from open networks. All firewalls are configured to deny all traffic, and then only opened for necessary communication.

The certification authority systems shall also be configured to provide the minimum functionality required for the issuing service. All communication ports that are not clearly required shall be disconnected and software processes using these ports shall be turned off.

The certificate validation service is protected by multiple layers of firewalls that only allow OCSP requests with valid formatting and signature.

The merchants are responsible for keeping their own private keys secure. Further advice about this is available in [21].

The central storage entity is not directly accessible from any open networks. There are dedicated VLANs within the security room, separating the services.

Data from RA to the Certification Authority System are transferred via a closed network where only known machines have access.

The BankID PreProduction system allows third parties to test and verify the different BankID certificates. BankID Support provides the necessary certificates for testing purposes.

The PreProduction system issues certificates from a CA clearly named Test in the Common Name.

For Bankenes ID-tjeneste: Networks between bank and Service Providers are secure and network security is audited.

For Danske Bank: In Danske Bank, Firewalls are configured to prevent unauthorized protocols and accesses. Security patches are processed on a monthly basis. Urgent Security patches outside cycle is processed and escalated as a production incident.

The Danske Bank Network are divided in building blocks. The Internal building blocks are interconnected without firewalls whereas all DMZ services are behind firewall protection. All new workload that are build since summer 2017 are based on zero-trust and are protected with several layers of protection. All applications will be migrated to the zero trust environment over the next 2 years.

Restrictive access between the zone is established according to firewall policy. All exceptions are reviewed by Group IT security. Dedicated network for administration of IT systems. Staging environments are TEST, SYST and PROD. Communication between different security zones are only allowed thru trusted encrypted channels and redundancy is ensured by two datacentres.

Processes for patching are in place. Patching is performed due to specific schemes per platform taking severity into consideration prioritising external facing systems.

Environments for development, testing and production are separated. Developers have restricted access to production environment based on authorizations and business needs.

For DNB: The RA-systems are protected by multiple layers of firewalls and cannot be accessed directly from open networks. All firewalls are configured to deny all traffic, and then only opened for necessary communication. The network between the service provider and the TSP are a closed, none public, network.

For Eika: Eika Gruppen and our suppliers and service providers have a variety of protective measures, as anti-virus software, firewalls etc.

The host computers used in Eika Gruppen's BankID solution are not directly accessible through open networks. The BankID solution is also protected by firewalls. Communication between CA and RA is also protected.

Eika Gruppen and its service providers have procedures for applying security patches when they come available.

For Nordea: No additions.

For SpareBank 1: RA system is placed in a network zone separated from other internal networks, guarded by firewall with statefull packet inspection. Only defined personnel have access to the separated network zone. All network communication is encrypted.

6.8 Time-stamping

All servers are set to automatically sync clocks several times an hour using NTP service. In, addition there are daily scheduled tasks to to verify the connection with the NTP server. These tasks are stored according to section 5.4.

7 Certificate, CRL, and OCSP profiles

7.1 Certificate profile

This chapter is by no means a specification, but an overall explanation of some of the fields included in certificates and revocation lists used in BankID policies.

BankID Root CA only issues certificates to individual Level 1 CA's in the BankID CA hierarchy. The Level 1 CA issues certificates for Merchants, OCSP and RA. The Level 1 CA also signs and issues CRL's for later proof of a certificates status at a given time.

Issued certificates and usage:

1. Root issues Level 1 CA certificate
2. Level 1 CA issues the following certificate
    a. OCSP certificates
    Used for Certificate validation services. The OCSP certificate signs the OCSP requests related to the specific Level 1 CA only. The Certificate validation service connects to the Level 1 CA database and verifies the certificate status directly.
    b. RA certificates (consist of 2 different types)
    RA SSL certificate - enables the Issuers RA to connect to the COI and perform certificate ordering and revocation services.
    RA XML Signing certificates - used by the RA to sign all orders and revocation messages in an XML format sent to the COI, to safeguard the RA system and provide traceability through the RA process.
    c. BankID Merchant certificates is used for authentication and signing in merchants sites.

BankID subject certificate profiles are based on and comply with ETSI EN 319 412-3 certificate profiles, see document "BankID certificate profiles" [13].

7.1.1 Version numb\er(s)

The version number is 2, indicating that the format X.509, version 3 [21] is being used.

7.1.2 Certificate extensions

See "BankID Certificate Profiles" [13] for a description of certificate extensions used with BankID.

7.1.3 Algorithm object identifiers

The algorithm identifier is sha256RSA (identifies algorithms used to sign the certificate content)

7.1.4 Name forms

This is described in section 3.1.

7.1.5 Name constraints

This is described in section 3.1.

7.1.6 Certificate policy object identifier

The object identifier is included in the certificatePolicies field of the certificate.

For file-based Merchant BankID: {joint-iso-itu-t(2) country(16) norway(578) organisasjon(1) bankenes-standardiseringskontor(16) policy(1) corporate(6) soft(1) 1}

For HSM-based Merchant BankID: {joint-iso-itu-t(2) country(16) norway(578) organisasjon(1) bankenes-standardiseringskontor(16) policy(1) corporate(6) hsm(2) 1}

7.1.7 Usage of Policy Constraints extension

The BankID merchants certificates is issued to merchants which must be Norwegian Bank Customers or the banks itself.

7.1.8 Policy qualifiers syntax and semantics

Not applicable.

7.1.9 Processing semantics for the critical Certificate Policies extension

Not applicable

7.2 CRL profile

7.2.1 Version number(s)

Standard format X.509 and RFC 5280, version 2 integer 1 is used for the revocation lists [21].

The time of the next update is always be included in the revocation lists.

7.2.2 CRL and CRL entry extensions

According to RFC 5280.

7.3 OCSP profile

The OCSP profile is according to RFC 6960.

7.3.1 Version number(s)

The version number is version 1, with integer 0.

7.3.2 OCSP extensions

Not applicable for MerchantBankID.

8 Compliance audit and other assessments

8.1 Frequency or circumstances of assessment

TSPs, banks acting as RA and their service providers, including the service provider of the CA-systems and the central storage entity are subject to periodic compliance audits. Compliance audits shall are performed at least once every three years. In addition, compliance audits will be carried out when new TSPs commence operations or when there are major changes in the solutions of established TSPs. This will ensure that their operation complies with the TSPS.

Audits of the TSPs, banks acting as RA and their service providers to verify that they meet requirements other than those in the BankID TSPS (e.g. from Public Authorities) may come in addition to the above-mentioned compliance audit. The banks and their service providers will be audited and controlled by:

- The Financial Supervisory Authority of Norway or similar supervisory authority for foreign banks;
- Potentially self-imposed external audit against quality standards in the ISO 9000 series;
- Potential self-imposed external audit against standard for security and good practice;
- Bits AS
- Internal audit and control functions

8.2 Identity/qualifications of assessor

Bits AS has the right to approve the auditor. The auditor should be selected in agreement with the issuer of BankID, the service provider and Bits AS

8.3 Assessor’s relationship to assessed entity

Compliance audits are performed by an independent auditor not employed by or associated with the TSP, bank acting as RA, or any of the service providers involved in operating BankID services on behalf of these entitites.

8.4 Topics covered by assessment

The audit should determine whether the requirements and practices in the BankID TSPS and referred ETSI standards are met by the TSP practices, covering the TSP, bank acting as RA and any service provider involved in operating BankID Services on behalf of these entities. This TSPS is a mandatory underlying documents. Further confidential security documentation may be submitted and taken into account during compliance audits.

8.5 Actions taken as a result of deficiency

Any discrepancy between regulations, rules defined in the policy and the written TSPS, and the way the bank acting as RA, TSP, service provider or mobile operator actually operate, shall be reported to the management team of the relevant party and Bits AS. The parties will jointly define corrective measures and set a deadline for implementation. Bits AS shall assess whether banks shall be informed immediately of matters relating to the joint issuer, service provider or mobile operator used by the bank.

The party that has been audited decides who can access the results of compliance audits. A final summary shall however not be classified, and shall be made available on request. This summary should contain information about any deviations of significance that could impact relying parties' trust in the certificates, but shall exclude details that can be used to attack the system.

In the event of a discrepancy between requirements laid down in the relevant certificate policy and practical implementation, the service provider of the central storage entity will take immediate action to correct the discrepancies. The service provider is certified in accordance with the ISO9001 [12] standard and has a quality system with clear routines and identified resources with the relevant competencies to perform change processes to correct deviations.

8.6 Communication of results

The party that has been audited decides who can access the results of compliance audits. A final summary shall however not be classified, and shall be made available on request. This summary should contain information about any deviations of significance that could impact relying parties' trust in the certificates, but shall exclude details that can be used to attack the system.

9 Other business and legal matters

9.1 Fees

9.1.1 Certificate issuance or renewal fees

No applicable fees.

9.1.2 Certificate access fees

No applicable fees.

9.1.3 Revocation or status information access fees

No applicable fees.

9.1.4 Fees for other services

No applicable fees.

9.1.5 Refund policy

No applicable fees.

9.2 Financial responsibility

9.2.1 Insurance coverage

The TSP maintains sufficient financial resources and/or obtain appropriate indemnity declaration from participating banks, in accordance with national law, to cover liabilities arising from its operations and/or activities. See section 16 in BankID Rules for further information.

9.2.2 Other assets

Not applicable

9.2.3 Insurance or warranty coverage for end-entities

Provided that a MerchantBankID is issued by a TSP according to this TSPS and 'Regler om BankID' , and that the subscriber has used the BankID according to the end user agreement, the TSP is liable for up to NOK100.000,- per transaction.

9.3 Confidentiality of business information

The issuer of BankID shall communicate its current rules and procedures for processing personal data.The TSP and bank acting as RA have a duty of confidentiality in accordance with the rules of the Norwegian Financial Business Act §9-6, unless otherwise directed by statutory disclosure obligations. Any service providers of the TSP and the bank acting as RA, is be subject to corresponding confidentiality requirements by agreement with the TSP. The Electronic Signature Act [15] and the Personal Data Act [14] will also apply.

9.3.1 Scope of confidential information

The TSP, the bank acting as RA, and any serviceprovider involved in the operation of BankID are amongst other things responsible for keeping the following types of information confidential:

- Subject’s or subscriber’s data that cannot be found in the certificate or any publicly available directory service;
- Issuer's and Registration Authority’s private keys;
- Passwords, PINs and other activation data, provided the information is held by the bank/issuer;
- All private keys belonging to subjects if at any stage they have been processed by the issuer or its service provider;
- Log data;
- Documentation providing additional details of the operational procedures of the issuer and its service provider.

Other types of data in central storage entities to be kept confidential include information about activation and authentication data for subjects, transaction data and technical security in the infrastructure.

9.3.2 Information not within the scope of confidential information

The following types of information processed by BankID issuers are not considered confidential:

- Certificates;
- Revocation status for a certificate;
- Policy documents

It shall not be possible to avoid appearing on a revocation list, or to avoid that the certificate status of BankID is shared with authorised certificate validation services.Information about subjects (name, d.o.b. etc.) that can be found on certificates, are not considered to be confidential.

9.3.3 Responsibility to protect confidential information

The TSP, the bank acting as RA, and any serviceprovider involved in the operation of BankID, including mobile operators have a duty of confidentiality as stated in section 9.3.1. Disclosure of information may occur as a result of statutory disclosure obligations.

Disclosures over and above the imposed obligation to provide information or access requires permission from the subject.

9.4 Privacy of personal information

9.4.1 Privacy plan

Subjects information is managed by the RAs according to Norwegian Personal Data Act [14].

For Bankenes ID-tjeneste: BID does not manage subject information.

For Danske Bank: Danske Bank adhere to and comply with GDPR and its principles.

For DNB: Subjects information is managed by the RAs according to Norwegian Personal Data Act [14].

The TSP guidelines for handling of personal data applies. The object of these guidelines is to describe the principles that apply to the handling of personal data in all companies in the TSP. The guidelines shall help ensure that the TSP always handles personal data in accordance with fundamental principles for privacy protection, The TSP's own internal requirements and special external and internal requirements that apply for individual companies in the Group. When handling personal data, the TSP shall place great emphasis on ensuring that rules are followed and that the privacy of individuals is thereby protected. The manner in which the TSP handles personal data should instill confidence both within and outside the TSP.

For Eika: No additions.

For Nordea: No additions.

For SpareBank 1: Only necessary personal information is handled within the system. Access to the information is limited to personnel in need of it for error handling and normal operation. User actions are logged. Operation is done in accordance with the privacy act.

9.4.2 Information treated as private

The TSP, the bank acting as RA, and any serviceprovider involved in the operation of BankID are amongst other things responsible for keeping the following types of information private:

- Subject’s or subscriber’s data that cannot be found in the certificate or any publicly available directory service;

9.4.3 Information not deemed private

Information elements found in the BankID MerchantBankID certificates are not deemed private.

9.4.4 Responsibility to protect private information

The TSP, the bank acting as RA, and any subcontractors involved in the operation of BankID are obliged to protect private information according to Act of 14 April 2000 No. 31 relating to the processing of personal data [14] and Act of 25 June 1999 on financial contracts and financial assignments [Financial Contracts Act] [28].

9.4.5 Notice and consent to use private information

The end user's consent to use private information is included in the standard agreement template used between the bank acting as RA and the end user.

Certificates are not generally available for retrieval from the TSP and information in the BankID certificates is only available when the subject has actively used the certificate.

9.4.6 Disclosure pursuant to judicial or administrative process

Disclosure of private information by court order or prosecution attorney order with reference to ongoing investigation.

9.4.7 Other information disclosure circumstances

Not applicable.

9.5 Intellectual property rights

The subject has right of disposal over their certificate, including the right to request invalidation (revocation/ suspension).

The BankID scheme owner owns the BankID software and documentation that is distributed in connection with the BankID service.

9.6 Representations and warranties

9.6.1 CA representations and warranties

The TSP shall:

- Issue, invalidate or renew certificates;
- Perform all technical controls described in Chapter 4 to 6 in this document
- Create and maintain a database of certificates;
- Create and periodically maintain information about revoked and invalidated certificates and make information about invalidated certificates available to Certificate Validation Services;
- Protect their private keys as described in Chapter 4 to 6;
- Produce event logs and system status information for archiving;
- Comply with the provisions of the "BankID Rules" [1], relevant parts of the Root-CA CP/CPS [16], this TSPS

The tasks listed above must be performed correctly by both the TSP and the bank acting as RA. In addition to the tasks above, TSP's representing independent banks acting as RA must:

- Be approved by Bits AS;
- Fulfil the equity ratio requirement in the Electronic Signature Act [15];
- Enter into agreements with the banks acting as RA.

A TSP's private key for issuance of certificates shall only be used to sign certificates and CRLs.

9.6.2 RA representations and warranties

The RA shall:

- Verify and confirm the identity of persons who order certificates on behalf of an enterprise, verify that the person is authorised to act on behalf of the enterprise, and store information to prove that the correct procedure has been followed;
- Guide and assist the customer in the registration process;
- Perform the procedures described in Chapter 3 to ensure that the enterprise exists, is registered in a national register, and fulfils the requirements to be issued with a MerchantBankID;
- Compile and forward relevant customer information that is necessary to issue BankID to the issuer;
- Ensure that a unique identifier is used or assigned to identify the enterprise;
- Have the opportunity to initiate invalidation of certificates;
- Assist Merchant customers who contact the bank due to suspected attempts at using a compromised or forged BankID, and if the bank finds that the suspicion is warranted, contact the issuing bank for the suspected compromised BankID;
- Comply with the provisions of the "BankID Rules" [1], relevant parts of the Root-CA CP/CPS [16], this TSPS.

9.6.3 Subscriber representations and warranties

Key obligations for subjects shall also be documented in the agreement between the bank and the customer. [20].

The Subject shall:

- Follow the procedures provided when applying for a certificate;
- Provide correct and complete information when applying for a certificate;
- Read and understand the terms and conditions for issuing and using BankID, make these available to relevant personnel. Confirm acceptance of terms to the bank;
- Only use subcontractors trusted by the merchant, and follow procedures in accordance with the agreement between the bank and the merchant;
- Verify that information in the certificate is correct and notify the bank of any errors;
- Perform the required tests and activation sequences;
- Only use keys and certificates in connection with BankID Certified Software and in accordance with the intended use;
- Protect passwords, PINs, activation data, and private keys and ensure they are kept secret;
- Inform the bank of any matters of importance to the contractual relationship, including changes to information supplied at the time of issuance;
- On request, be able to document which IT systems, processes and people have access to private keys;
- Warn the bank (or its service provider) of any suspicion that the merchant's private key has become known to others;
- Warn the bank of any suspicion that activation data or passwords may have become known to others;
- Immediately stop using a BankID if subject suspects that the merchant's private key or activation data has become known to others;

If there is reason to suspect that someone has attempted to use a compromised or forged BankID on the merchant site, the subject shall immediately notify their issuing bank.

9.6.4 Relying party representations and warranties

The relying party may be a bank, a legal person or a natural person.

The relying party shall:

- Check the certificate's validity and decline it if it is invalidated, expired or otherwise terminated;
- Check for, and take into account any usage restrictions for the certificate arising from signed agreements or the certificate policy the certificate is issued under;
- Only use the certificate and associated public key data for the purpose specified in the certificate (e.g. through the use of the *certificatePolicies* field);
- Act in accordance with the Bank's policy of tagging transactions so that the current Key Usage is clearly visible to the subject.

9.6.5 Representations and warranties of other participants

Service providers for issuing systems

A service provider may perform all or part of a TSP or bank acting as RA functions. The service provider must act in accordance with this document as well as written agreements between the parties.

The main point of contact for both subject and relying party shall always be the bank acting as RA with which they have entered into a contract, regardless of whether functions are performed by a joint issuer or a service provider.

Service provider for central storage and usage entitity

Service providers for the central storage entitiy shall:

- Create and maintain event logs and archives in accordance with this TSPS;
- Make logs and archives available on receipt of a valid and authorised request from a TSP and RA;

9.7 Disclaimers of warranties

This is described in the BankID Rules document.

9.8 Limitations of liability

TSP liability

The TSP liability in relation to the customer and vice versa, both for Personal BankID and Employee BankID, is governed by agreements, both when the customer is a subject and a relying party.

In the case of Employee BankID, the liability relationship between the TSP and the enterprise is governed by agreements, both when the enterprise enters into an agreement on Employee BankID and when the enterprise is a relying party.

Regardless of whether the TSP is the same legal entity as the RA, or the bank acting as RA is a separate legal entity, the TSP and RA liability is governed by the agreement between the bank acting as RA and the subject [20].

The TSP and bank acting as RA liability also applies where the RA or TSP has used a service provider.

The TSP can also be held liable based on standard contractual provisions. When BankID is used for financial transactions covered by the Financial Contracts Act (Finansavtaleloven), the TSP liability for these transactions will be governed by the liability rules in the Financial Contracts Act.

Distribution of responsibility between TSP's, including Right of Recourse, is governed by agreements between the banks.

Bank acting as RA liability

The bank assumes liability in relation to the customer in accordance with the agreement between the two parties, and also for Registration Authority tasks undertaken by a service provider. If the bank uses a service provider as Registration Authority, the Registration Authority’s responsibility in relation to the bank shall be further regulated by agreement between the Registration Authority and the bank.

Subject liability

The subject’s liability is governed by the agreement [20] between the bank and the subject. If the customer uses BankID, software or documentation in violation of the signed agreement, including unauthorised modification or manipulation of BankID or software, the bank may hold the customer liable for any losses the bank suffers in consequence.

The customer will also, in accordance with common legal practice, be held responsible for dispositions made by anyone who has been able to use the customer's BankID due to an intentional or negligent act or omission by the customer.

9.9 Indemnities

The TSP's financial liability is limited to NOK100.000 per transaction [20]. This limit does not apply if the TSP, its service provider or any other entity the bank is liable for, has acted wilfully or grossly negligently.

If the subject (and relying party) fails to fulfil the obligations in Chapter 9.6.3 and 9.6.4, they can be held liable for any losses that may arise, or their claims against the bank may be reduced or fall away as a result of breach of obligations.

Banks acting as RA that use a TSP that is a separate legal entity from the bank must ensure that the TSP has sufficient financial resources in accordance with the equity ratio requirements in the Electronic Signature Act [15]. Liability of the bank acting as RA in relation to the TSP or vice versa, or in relation to other service providers and vice versa, is governed by agreements between these entities.

The TSP and service provider are not liable for a subject's incorrect use of a certificate.

9.10 Term and termination

9.10.1 Term

This TSPS remains in force until it is explicitly replaced by a new version of the TSPS in accordance with section 1.5.

9.10.2 Termination

This TSPS, even if replaced by a new version of the TSPS remains in effect for all BankIDs issued while the TSPS was in force.

9.10.3 Effect of termination and survival

No stipulation.

9.11 Individual notices and communications with participants

No stipulation

9.12 Amendments

9.12.1 Procedure for amendment

Amendments to this TSPS that are not deemed substantial may be made and approved by Bits AS without further notice.

The TSP, bank acting as RA or any of their service providers involved in operation of BankID shall be informed that there is a new version available.

Bits AS will send the amended TSPS to the National Competent Authority (nkom) without delay.

9.12.2 Notification mechanism and period

In case of amendments to the TSPS not deemed substantial, the National competent authority shall receive a one month prior notice that a new amended version of the TSPS will be in effect from a given date. The notice will include a short summary of the nature of the amendment.

No later than on the effective day of the amended TSPS, the National competent authority shall be sent the amended TSPS.

9.12.3 Circumstances under which OID must be changed

According to ETSI EN 319 401 [24] for any changes that affect the applicability of the certificate policy, the OID should be changed. For any change in requirement or practices, that are deemed substantial and affect the applicability of the TSPS the principles for policy administration as outlined in section 1.5 will be followed. If a new OID is required, Bits AS will allocate a new OID from the range. As this requires technical changes in both the CA-system setup, the central storage entity and for the merchants the new OID will be noticed at least 6 months in advance of effective date.

9.13 Dispute resolution provisions

Disputes in connection with the issue and use of BankID are governed by Norwegian law. Any cases must be brought before Norwegian courts. Disputes between a consumer and a bank about services provided by a bank can usually be brought before The Norwegian Financial Services Complaints Board.

9.14 Governing law

The European eIDAS regulation [23] and the Norwegian Personal Data Act [14] applies.

9.15 Compliance with applicable law

This TSPS is written to comply with Norwegian Law.

9.16 Miscellaneous provisions

9.16.1 Entire agreement

The TSP holds an authorisation from the Root-CA owner; Finance Norway granting authorisation to issue BankID certificates according to the scheme rules (BankID Rules).

The TSP has an agreement with the bank acting as RA detailing the obligations and liabilities between the parties.

A template has been made for the agreement between the bank acting as RA and the subject/subscriber. Alle banks acting as RA are obliged to use this template when issuing BankID according to this TSPS.

Agreements with relying parties are made by Vipps AS, and includes interoperability of BankID use between BankID certificates issued by different TSP's.

The TSP has entered into an agreement with Vipps AS for access to the interoperable scheme, the central storage entity and the operational infrastructure, including operation of the common BankID certificate validation services.

The TSP has entered into an agreement with the service provider of the TSP CA-system for operation of the CA.

The Bank acting as RA has entered into agreement with service providers for operation of RA-system and authentication elements (i.e. one time password mechanisms).

9.16.2 Assignment

No stipulation

9.16.3 Severability

No stipulation

9.16.4 Enforcement (attorneys' fees and waiver of rights)

No stipulation

9.16.5 Force Majeure

No stipulation

9.17 Other provisions

9.17.1 Termination of the BankID scheme

Potential disruptions to subscribers and relying parties shall be minimized as a result of the cessation of the TSP's services, and in particular continued maintenance of information required to verify the correctness of trust services shall be provided.

The TSP has established a termination plan with the following procedures:

- Information to all subscribers and service providers involved in the operation of BankID
- Information to all banks acting as RA
- Information to all relying parties
- Information to all mobile operators for mobile Personal BankID
- Information to other TSP's issuing BankID certificates
- Information to national authorities
- Backup and storage of all evidence of certificates and transactions with a trustworthy service provider
- Information to all relying parties on how the revocation status will be provided for the retention period stated in chapter 5.5.2.
- Destruction of all TSP private keys

If the TSP is not able to fulfil these obligations due to financial or other circumstances (such as bankruptcy), Vipps AS and Bits AS will perform the tasks deemed necessary to fulfil the tasks.

Vipps AS and Bits AS will keep backup of the TSP public key or any other trust service tokens for verification purposes.

For Bankenes ID-tjeneste: BID as Joint Issuer will not be terminated as long as there are banks with active certificates issued by BID. BID's owners have established agreements and procedures that ensures that the last bank using BID as Joint Issuerunder agreement (Bruksrettsavtale) and with active certificates will be the sole owner of the company and can terminate BID as Issuer only after revocation of the Bank's certificates issued by BID. This is a part of the shareholder's agreement and ensures that the company can be terminated in a controlled way. The shareholder's agreement also commits the owners to continue the operations of the company as long as there are RAs with a valid Bruksrettsavtale and active Certificates. Termination of a Bruksrettsavtale implicates that all certificates issued by the RA shall be revoked.

For Danske Bank: No additions.

For DNB: No additions.

For Eika: The termination plan of Eika Gruppen states that Eika will:

- Inform the owner of the parent CA (BankID root-CA) about the planned termination at least 6 months in advance.
- Inform the subjects, relying parties and other TSPsof BankID at least 6 months in advance.

- Publish information of the planned termination at least 3 months in advance.
- Ensure that all relevant databases, archives, and documents are kept in accordance with CP and TSPS.
- Ensure that all Eika Gruppen's private keys, including backup copies, are destroyed, or withdrawn from use, in a manner such that the private keys cannot be retrieved
- Make arrangements to transfer provision of trust services for its existing customers for a limited period of time to another TSP where relevant and possible.

Eika does not outsource any functions relating to the process of issuing trust service tokens, so no notification regarding this is necessary.

Eika Gruppen will also ensure that banks that use its services receive the necessary information to move to another issuer of BankID. The banking industry has furthermore prepared procedures that shall be followed if a participating bank or registration authority goes into administration.

Eika Gruppen will further back up all log data in its possession and enable storage for at least 10 years in an archive that is readable.

All of Eika Gruppen's private keys will be destroyed.

According to the Norwegian BankID Rules a TSP of BankID shall have an arrangement to cover the costs to fulfil these minimum requirements regarding continued fulfillment of certain obligations toward customers and relying parties in case the TSP becomes bankrupt or for other reasons is unable to cover the costs by itself, as far as possible within the constraints of applicable legislation regarding bankruptcy.

Eika Gruppen has such guarantee arrangements.

For Nordea: No additions.

For SpareBank 1: No additions.

9.17.2 Risk management

The TSP has a inventory of all information assets and assign a classification consistent with the risk assessment, in order to ensure appropriate level of protection of primary (Information and Business process) and supporting assets (site, personnel, hardware, software, network etc.).

The TSP has established a process for yearly risk assessment of its TSP operations to determine all security requirements and operational procedures which are necessary to implement the risk treatment measures chosen.

The TSP risk assessment is based on an aggregation of risk assessments made by:

- The service provider of the CA-system and the central storage entity.
- The service provider of the bank acting as RA, and their service providers.
- The service provider of any authentication elements (i.e. one time password tokens and related services)
- The TSP own organisation and operation

The risk assessment procedures are revised on a yearly basis.

The risk assessment is followed by identification of risk treatment measures to ensure that the risk level is kept at an acceptable level.

The TSP management has approved the risk assessment and accepted the residual risk.

For Bankenes ID-tjeneste: BID as Joint Issuer and its RAs, which are banks, perform an annual risk analysis for the risks associated with issuing BankID certificates taking into account both business and technical risks. The analysis performed by the RAs are confirmed to BID and risks and possible actions reported are taken into consideration by

the RA. The risk assessment performed by the operator of the Common Operational Infrastructure is taken as input to the TSP risk assessment. RAs are identified in APPENDIX 1.

For Danske Bank: Danske Bank follow the guidance and risk evaluations process from Vipps AS and Bits AS. Danske Bank does a risk assessment whenever major changes happen in the system and with every major change, a Security Assessment is done.

Danske Bank has continuous overview of the fraud issues, in case of unusual patterns, the bank re-evaluate and change the systems and risk assessment. In addition, Danske Bank and FinansCert Norway collaborates for monitoring the daily threats against BankID.

Security requirements and operational procedure definition task is performed primary by the Danske Bank Business representatives in Norway and secondarily by the eBusiness Security department, the later make the needed changes in the IT systems.

Approval of the Risk Assessment is followed as a part of the security assessment process of Danske Bank system and Group Security department of the bank accepts the residual risk

Group Operational Risk defines the overall policies and framework for Operational Risk Management and IT Risk is governed by the operational risk policy and framework as well. Group IT Security and Risk has more detailed risk management processes in place. The general risk assessment covers the whole platform including physical and logical security aspects as well as cyber risks. On a local plan, risks are identified for individual solutions in relation to the custody business and actions plans are in place to address any risk identified. This is then fed through to the local Operations risk register and consolidated with all units risks.

Risk Management committees

The Enterprise Risk Management (ERM) framework specifies a number of Risk Committees, which are responsible for the oversight and control of risks, group wide. These include, for instance, the Board Risk Committee, the All-Risk committee, various specific oversight committees (e.g. Operational Risk Committee), and several others.

In addition, Country, Subsidiary, Business and Function Units are allowed to establish local risk committees. Local risk committees must ensure that risks within the given entity are managed effectively and in accordance with risk frameworks and constraints set by the Group. The country, subsidiary business or function manager is chairman of the local risk committee. Established local risk committees functionally report to Group risk committees.

Operational Risk Policies and Procedures

Local risk policies follow the Group Operational Risk Policies and Procedures.

Group Operational Risk is responsible for developing operational Risk Policy. The Board of Directors approves the policy and specifies high-level principles and standards of operational risk management for the Danske Bank Group. In addition, the Operational Risk Framework endorsed by the Executive Board describes how the Executive Board implements and embeds Operational Risk Policy across the Group. Furthermore, the Bank has a Fraud Policy, Outsourcing Policy and Corporate Governance Policy.

Operational risk control and assessment tool

Operational risk control and assessment is implemented via the Operational Risk Management Process. This process is established for both operational risks and operational risk events management to ensure that risks are identified, assessed and managed effectively across the Group, so the Group remains within risk appetite.

Operational Risk Standards and tools, including risk taxonomies and matrices, are applied to give comparable indicators and ensure management of operational risks. Dedicated information systems are in place for capturing identified risks and operational risk events. Tools such as the Business Risk Management document and Fraud Risk Register are used by the business to document, mitigate and reduce risks. An IT Risk assessment is carried out for projects internally in the bank as well as when suppliers are used.

Who are the providers of the coverage

Roles and responsibilities related to risk management are defined in accordance with a three lines of defence principle:

The business units and the operations and service organisations represent the first line of defence. This entails individual units who own and manage their own activities and risk, either at business level or at function level. The heads of the business units, operations areas and service areas are responsible for all business-related risks

The second line of defence is represented by the group-wide functions that monitor whether the business units and the operations and service organisations adhere to the general policies and mandates. These are independent control functions who specify the policies and standards under which the first line must operate.

The third line of defence is Group Internal Audit (GIA) Defence and is headed by the Chief Internal Audit Officer. Local auditing functions are functionally part of Group Internal Audit. Group Internal Audit provides an independent and objective assurance to test the design and operating effectiveness of the internal control environment in the First Line and Second Line.

Independent risk management area: The local risk management area is functionally part of Group Risk Management. Group Risk Management (unit) is an independent risk management area and acts as the second line of defence. The Group Chief Risk Officer, who is also an Executive Board member, heads this unit. Likewise, local Operational Risk functionally is part of Group Operational Risk.

Reviews by external auditors: An external audit firm is responsible for the statutory financial audit of the Danske Bank Group. The audit is conducted in accordance with the International Standards on Auditing and additional requirements under the Danish audit regulation. Currently, Deloitte Statsautoriseret Revisionspartnerselskab is the appointed external audit firm.

For DNB: Merchant BankID is part of the applications connected to the TSP's security applications and are on the TSPs list of the most critical routines. Annually risk assessments are conducted

For Eika: Eika Gruppen performs regularly risk analysis for the risks associated with issuing BankID certificates. The risk assessment takes into account both business and technical risks. The risk asessments performed by the operator of the Common Operational Infrastructure and other parties are taken as input to the TSP risk asessment. Detailed procedures and templates for the TSP risk assessment is maintained in the Eika Gruppen's Quality system.

Eika Gruppen's risk procedure is evaluated and revised on a yearly basis.

The BankID risk assessment is presented to Eika Gruppen's Executive Management, who will accept the residual risk or request additional measures to be taken.

For Nordea: No additions.

For SpareBank 1: No additions.

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