emdha Digital Signature Certificate (DSC) CA - Certificate Policy and Certification Practice Statement (CP/CPS)

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Policy Authority Committee

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Version	Date	Author(s)	Revision Notes and Comments
1.0	18-Jan-2021	Sivaraman Natrajan	First official issue – Long term Certificate
1.1	21-Oct-2022	Sivaraman Natrajan	- Introduced certificate profile for Cloud-based DSC Digital Seal Certificate - Wathq service of MoC included as RKA

	Reviewer	Approver
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Title	General Manager	Chairman - Policy Authority Committee
Date	09-FEB-2023	09-FEB-2023

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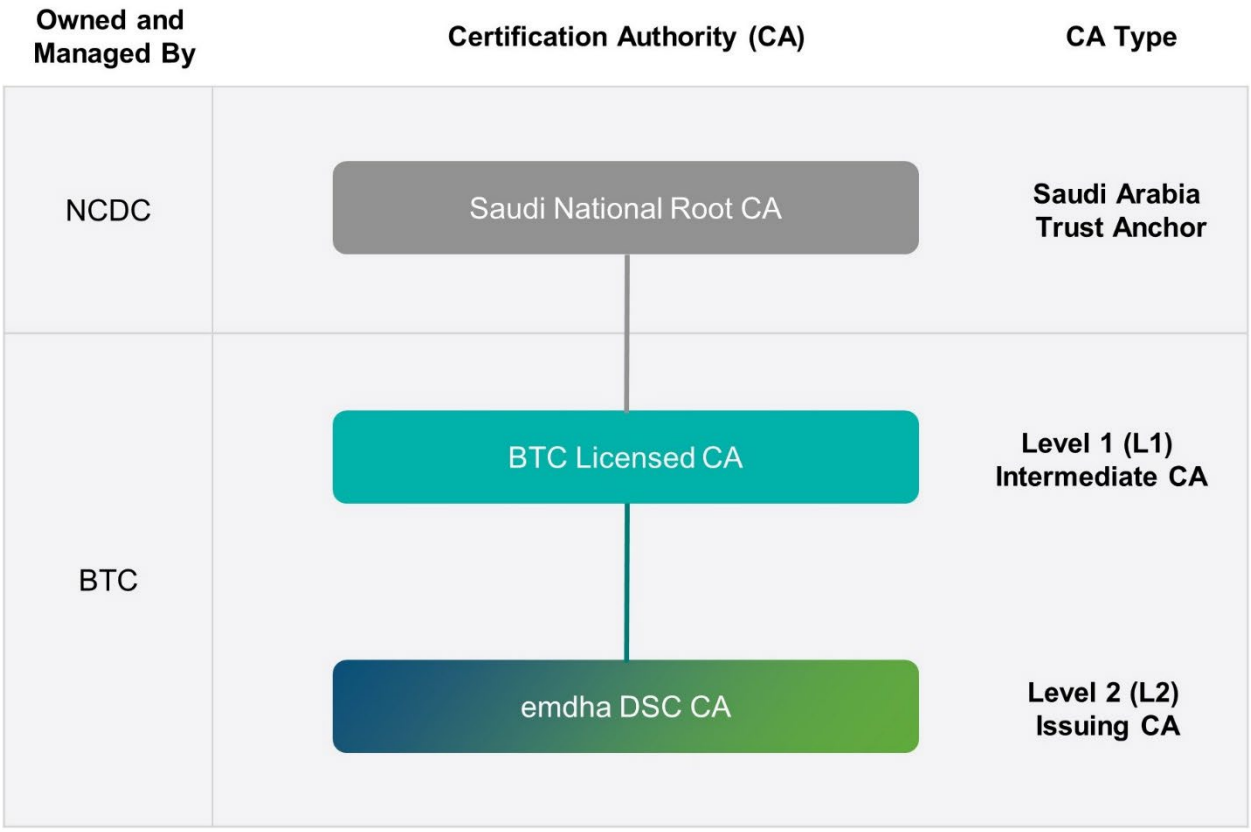
1. Introduction

Baud Telecom Company is licensed by Communications and Information Technology Commission (CITC) and National Centre for Digital Certification (NCDC) to build, own and operate a commercial licensed CA in the Kingdom of Saudi Arabia. For more information on NCDC, please refer to https://www.ncdc.gov.sa CA acts as a "Certification Service Provider", as defined under the definition of Article 1(21) of Kingdom's e-Transactions Law. The Digital Certificates issued by BTC LICENSED CA provides legal validity for its electronic signature, under the definitions of Article 1(17) of Kingdom's e-Transactions Law.

The e-Transactions Law of Kingdom of Saudi Arabia grants legal recognition to digital / electronic signatures. This provides that "If a signature is required for any document or contract or the like, such requirement shall be deemed satisfied by an electronic signature generated in accordance with this Law. The electronic signature shall be equal to a handwritten signature, having the same legal effects."



BTC Licensed Certification Authority (henceforth referred as BTC LICENSED CA) is owned by the Baud Telecom Company (referred as BTC). BTC LICENSED CA is a Certification Authority under the Saudi National Root CA. This is achieved by obtaining a digitally signed CA certificate issued by Saudi National Root CA owned and operated by National Centre for Digital Certification (NCDC) that validates BTC LICENSED CA and authenticates the associated Public Key. BTC LICENSED CA will issue the emdha DSC CA and any future L2 CAs.

emdha Digital Signature Certificate Certification Authority (henceforth referred as emdha DSC CA) refers to the CA entity directly under the BTC LICENSED CA, owned and operated by BTC, and is approved by National Centre for Digital Certification (NCDC) to be part of the Saudi National Public Key Infrastructure (PKI). This is achieved by the BTC Licensed CA issuing a digitally signed CA Certificate that authenticates the Public Key of the emdha DSC CA.

"EMDHA" is a registered trademark owned by Baud Telecom Company and is intended to be used as the name/trademark for BTC certification services and trust services.

emdha DSC CA provides trust services to secure the exchange of information between key stakeholders. Participants include government and its various agencies, autonomous and semi-autonomous public institutions, citizens, residents, and businesses. emdha DSC CA shall provide certificates to both emdha internal CA operations and its subscribers.

1.1. Overview

This document combines the CP and CPS documents and is thus presented as a single document. This document defines a high level of trust and assurance for use by all emdha DSC CA PKI participants. It provides definitions for the policies by which emdha DSC CA operates.

This document also establishes the processes and procedures followed by the emdha DSC CA to:

- Issue certificates to subscribers and internal CA Operations,
- Certificate issuance, management and revocation for supportive administrative roles for the emdha DSC CA operations,
- Manage core infrastructure that supports BTC PKI setup,
- Maintain or revoke certificates issued by the emdha DSC CA, and
- Operate the OCSP responder(s)

This CP and CPS comply with:

- BTC LICENSED CA CP and CPS.
- Internet Request for Comment "RFC 3647" of Internet Engineering Task Force (IETF) for Certificate Policy and Certification Practice Statement.
- Adobe Approved Trust List (AATL)/Microsoft Certificate policies.
- Internet Request for Comment "RFC 5280" of Internet Engineering Task Force (IETF) for Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile.

If any inconsistency exists between this CP/CPS and aforementioned references, then the references take precedence over this CP/CPS.

This document is subject to regular review by the BTC Policy Authority committee (BTC PAC), as specified in section 1.3.1 of this CP/CPS, and subject to amendment as well as exceptions to mitigate material, imminent impacts to subscribers, partners, relying parties, and/or others within the certificate ecosystem where practical workarounds do not exist. Such exceptions are tracked, documented and reported as part of the audit process.

Under the descriptions provided in this CP/CPS, emdha DSC CA establishes a hierarchical trust under the BTC LICENSED CA, which is an intermediate CA under the Saudi National Root CA.
It is the responsibility of all parties applying for or using a digital certificate issued under this CP/CPS, to read this CP/CPS to understand the practices established for the lifecycle management of the certificates issued by the emdha DSC CA. Any application for digital certificates or reliance on emdha DSC CA issued certificates signifies understanding and acceptance of this CP/CPS and its supporting policy documents.

emdha DSC CA is a Level-2 issuing CA in the Saudi National PKI hierarchy, maintained and operated by BTC in an online environment. The emdha DSC CA shall issue certificates to subscribers, internal CA operations and supportive functions for the emdha DSC CA operations, and Certificate Revocation Lists (CRLs).

1.1.1 Certificate Policy

This Certificate Policy document is assigned the OID: 2.16.682.1.101.5000.1.4.1.1.3. This OID will not be included as a certificate policy extension in CA certificates. Specific OIDs will be assigned to each certificate type, which will be included as a certificate policy extension in each certificate issued by the emdha DSC CA.

1.1.2 Relationship between the CP and the CPS

This document combines the CP and CPS documents and is thus presented as a single document. It states what assurance can be placed in a certificate issued by emdha DSC CA. It also states how emdha DSC CA meets the requirements for policies defined in this document.

This CP/CPS establishes the practices for the issuance, acceptance, maintenance, use, reliance upon, reissuance/renew/rekey and revocation of digital certificates issued by emdha DSC CA as governed by this document and related documents which describe Saudi National PKI requirements and use of Certificates.

1.1.3 Interaction with other PKIs

emdha DSC CA shall not cross-certify with other BTC or third-party CAs. emdha DSC CA will not issue any subordinate CA under itself.

1.1.4 Scope

This CP/CPS applies to all certificates issued by the emdha DSC CA. emdha DSC CA is a Level-2 issuing CA in the Saudi National PKI hierarchy, maintained and operated by BTC in an online environment. The emdha DSC CA shall issue certificates and Certificate Revocation Lists (CRLs) only for subscribers, internal CA operations and supportive functions for the emdha DSC CA operations.

1.2. Document Name and Identification

The OID assigned to BTC by NCDC is: {joint-iso-itu-t(**2**) country(**16**) sa(**682**) sa-organizations(**1**) government-organizations(**101**) ncdc(**5000**) pki-public-key-infrastructure(**1**) licensed-cas(**4**) certificate-policies(**1**) baud-telecom-company-btc(**1**)}

The object identifier (OID) values corresponding to the organization and CP/CPS are as follows:

Entity / Certificate Policy	OID
Baud Telecom Company (BTC)	2.16.682.1.101.5000.1.4.1.1
emdha DSC CA Certificate Policy Document	2.16.682.1.101.5000.1.4.1.1.3
emdha DSC CA OCSP Certificate	2.16.682.1.101.5000.1.4.1.1.3.3

emdha DSC organizes its OID arcs for the various Certificates described in this CP/CPS as per the table "Certificate Types"

Certificate Types

Sl No	Certificate Type	Certificate Policy OID
1.	DSC Individual Certificate (Natural Person)	2.16.682.1.101.5000.1.4.1.1.3.1
2.	DSC Organization Certificate (Legal Entity)	2.16.682.1.101.5000.1.4.1.1.3.2
3.	DSC Cloud-based Digital Seal Certificate (Legal Entity)	2.16.682.1.101.5000.1.4.1.1.3.4

The OIDs for the assurance levels offered are as per the table "Assurance Levels":

Assurance Levels

Sl No	Assurance Level of Certificate	OID
1.	Low Assurance Level	2.16.682.1.101.5000.1.4.1.1.3.101
2.	Medium Assurance Level	2.16.682.1.101.5000.1.4.1.1.3.102
3.	High Assurance Level	2.16.682.1.101.5000.1.4.1.1.3.103

1.3. PKI Participants

The following are the PKI Participants under the emdha DSC Certification Authority CP/CPS.

1.3.1 BTC Policy Authority Committee (BTC PAC)

BTC Policy Authority Committee (BTC PAC) is responsible for the governance of the BTC LICENSED CA and emdha DSC CA. Its members are appointed by BTC. Its tasks include:

- Establishing and implementing its CP and CPS for CAs under its domain, in conjunction with the Saudi National PKI Policy document;
- Reviewing and approving BTC PKI policies and other policies related to certification services and internal CA operations;
- Ensuring the operation of the BTC CAs comply with the requirements of its CP and CPS and Operations Policies and Procedures;
- Review and approve the various Agreements necessitated for the CA's specific business requirements, namely, SIP Agreement, Subscriber Agreement, Organization Agreement, Relying Party Agreement and other related Agreements;
- Review the compliance of internal audits, external audits and any security assessments;
- Seeking resolution of disputes between participants operating in its domain;

- Act as liaison with NCDC;
- Perform an annual review on key algorithms and lengths to determine appropriate level of security and assurance;
- Obtain NCDC approval for Issuing CAs under BTC Licensed CA;
- Approval of Issuing CAs under BTC Licensed CA;
- Manage and approve all MAJOR changes within the BTC PKI environment;
- Approve annual third-party penetration testing;
- Review vulnerability testing and vulnerability assessment reports;
- Reviews all operational documents once annually or as per the business requirements;
- Act as "Trusted Role" according to the assignations in the "Trusted Roles" document.

1.3.2 BTC Licensed Certification Authority (BTC LICENSED CA)

The term BTC LICENSED CA refers to the entity owned and operated by BTC which is approved by NCDC to join the Saudi National PKI, directly under the Saudi National Root CA.

BTC LICENSED CA is responsible for:

- Generation and issuance of "Issuing CA" certificates under the BTC LICENSED CA;
- Publication of Issuing CA certificates;
- Revocation of Issuing CA certificates;
- Publication of revocation information;
- Re-key of Issuing CAs;
- Conduct regular internal security audits;
- Assist in audits conducted by or on behalf of NCDC; and
- Performance of all aspects of the services, operations and infrastructure related to BTC LICENSED CA.

1.3.3 emdha Digital Signature Certificate (DSC) Certification Authority (emdha DSC CA)

The term emdha DSC CA refers to the CA entity owned and operated by BTC which is approved by NCDC to join the Saudi National PKI, directly under the BTC LICENSED CA.

emdha DSC CA is responsible for:

- Generation, issuance and distribution of subscriber and related internal CA operations certificates, and supporting services certificates under the emdha DSC CA;
- Revocation or/and suspension of subscriber and related internal CA operations certificates, and supporting services certificates;
- Publication of revocation or/and certificate status information
- Providing a means for Subscribers to request revocation.
- Reissuance/Renew/Re-key of subscriber and internal CA operations certificates;
- Conduct regular internal security audits;
- Assist in audits conducted by or on behalf of NCDC and/or WebTrust for CAs related audits; and
- Performance of all aspects of the services, operations and infrastructure related to emdha DSC CA.

1.3.4 Registration Authority (RA)

A Registration Authority (RA) is an entity that performs identification and authentication of certificate applicants, initiates or passes along revocation requests for certificates, and approves applications for issuance, reissuance, renewal or re-keying of certificates.

The requirements in this CP/CPS applies emdha DSC CA who acts as an RA for certificates it issues. Obligations of the Registration Authorities (RAs) within the emdha DSC CA include:

- Process digital certificate application requests
- Identifying and authenticating Subscribers in accordance with this CP/CPS, Identity Verification Guidelines (IVG) and Authentication for Signature Guidelines (ASG) published by emdha.
- Confirming that a certificate applicant's name does not appear in the list of compromised subscribers
- Optional issuance of tokens for applicants
- Maintain and process all supporting documentation related to digital certificate application
- Receiving, authenticating and processing certificate revocation requests
- Providing suitable training to personnel performing RA functions.

1.3.5 Reliable KYC Agency (RKA)

An organization or entity or application, listed in this document to act as a KYC (Know Your Customer) provider for the purpose of Digital Certificate Issuance.

RKA is responsible for:

- Subscriber's verification and authentication before providing the subscriber KYC information to emdha DSC CA. Such agency shall ensure the verification steps of the signatory shall be minimum or higher than the verification steps required by emdha DSC CA to verify for issuance of Digital Signature Certificate.
- Digitally signing subscriber KYC information using the prescribed certificate type before providing to the emdha DSC CA. It will be the basis for approving the subscriber certificate request.
- Obtaining user-consent and perform at least a 2-factor authentication for each key generation/request to emdha DSC CA;
- RKA asserts that they use processes associated with each transaction in accordance with this CP/CPS and the RKA agreement.
- Subscriber's verification and authentication through emdha User Account Vault (UAV) will be caried-out as per the emdha published Identity Verification Guidelines (IVG) and Authentication for Signature Guidelines (ASG) documents.

Following are entities eligible to be RKA's under this policy, subject to NCDC approval:

1. Any organization licensed and regulated by Saudi Arabian Monetary Authority (SAMA) in Kingdom of Saudi Arabia.
2. The National Information Center (NIC) of the Kingdom of Saudi Arabia and its authorized KYC provider partners or/and agencies.
3. Ministry of Human Resources and Social Development.
4. emdha User Account Vault (UAV) - emdha Repository of Verified Subscriber Information

5. Wathq Service for Organization KYC from Thiqah (Ministry of Commerce)

1.3.6 emdha User Account Vault (UAV)

emdha User Account Vault (UAV) is a highly secured database set up within an extremely secure and trusted zone that contains subscriber identification information obtained from a trusted and reliable source of Know Your Customer (KYC) information. The primary functions of UAV are :

- Encrypting and storing subscriber data during the registration process;
- Associating multiple authenticated roles with a registered subscriber account;
- Verifying a registered subscriber on the basis of two-factor authentication mechanism
- Providing reliable KYC information (that has to be included in the certificate) during the Digital Signature Certificate issuance process.

1.3.7 Subscribers

Subscribers include all end users consisting of natural persons and/or legal entities that successfully apply for the certificate and receive it. Prior to verification of identity and issuance of a Certificate, a Subscriber is an Applicant. Subscribers are legally bound by a Subscriber Agreement or Terms of use.

The subscriber asserts that he or she uses the key and certificate in accordance with this CP/CPS.
Obligations of Subscribers within the emdha DSC CA include:

- Generating or causing to be generated one or more asymmetric key pairs
- Submitting public keys and credentials for registration
- Providing information to the RA that is accurate and complete to the best of the Subscribers' knowledge and belief regarding information in their certificates and identification and authentication information
- Taking appropriate measures to protect their private keys from compromise
- Promptly reporting loss or compromise of private key(s) and inaccuracy of certificate information to Issuing CA / RA
- At all times utilize the Digital Certificate in accordance with all applicable laws and regulations.
- Use the signing Key Pairs for electronic signatures in accordance with the Digital Certificate profile and any other limitations known, or which ought to be known, to the Certificate Holder.
- Discontinue the use of the digital signature Key Pair in the event that Issuing CA notifies the Certificate Holder that the Issuing CA has been compromised.
- Using its key pair(s) in compliance with this CP/CPS.
- Any other terms as per Subscriber Agreement.

1.3.8 Relying Parties

A Relying Party is the entity that relies on the validity of the binding of the CA's or subscriber's identity to a public key. The Relying Party is responsible for checking the validity of the certificate by examining the appropriate certificate status information, using validation services provided by the emdha DSC CA. A Relying Party's right to rely on a certificate issued under this CP/CPS, requirements for reliance, and limitations thereon, are governed by the terms of the emdha DSC CA CP/CPS and the Relying Party Agreement.

Relying Parties shall use and rely on a certificate that has been issued under the emdha DSC CP/CPS if:

- The certificate has been used for the purpose for which it has been issued, as described in the emdha DSC CA CP/CPS, and applicable Subscriber Agreement;
- The Relying Party has verified the validity of the digital certificate, using procedures described in the Relying Party Agreement;
- The Relying Party processes and understands certificate extensions in accordance with RFC 5280;
- The Relying Party has accepted and agreed to the Relying Party Agreement at the time of relying on the certificate; it shall be deemed to have done so by relying on the certificate; and
- The relying party accepts in totality, the certificate policy applicable to the certificate, which can be identified by reference of the certificate policy OID mentioned in the certificate.

1.3.9 Online Certificate Status Protocol Responder

Online Certificate Status Protocol (OCSP) Responders provide revocation status information. The emdha DSC CA shall make their certificate status information available through an OCSP responder in addition to any other mechanisms they wish to employ. The emdha DSC CA shall publish status information for the certificates it issues in a Certificate Revocation List (CRL).

1.4. Certificate Usage

1.4.1 Appropriate Certificate Uses

emdha DSC CA certificates issued under this CP/CPS is used as defined by certificate extensions on key usage and extended usage. Further details about appropriate certificate uses are provided in Appendix B

1.4.2 Prohibited Certificate Uses

Certificates issued under this CP shall not be authorized for use in any circumstances listed below, and the emdha DSC CA shall not be liable for any claims arising from such use.

emdha DSC CA certificates are not for use in circumstances where:

1. Usage of certificate is in connection to any activity, which is illegal under the laws of Kingdom of Saudi Arabia.
2. Usage of certificate is inconsistent with the certificate extensions in key usage and extended key usage, as defined by RFC 5280.
3. Usage of certificate is above the designated reliance limits, if applicable.
4. Usage of certificate is for any equipment operated in hazardous conditions or under fail proof conditions (for example, Nuclear facilities, aircraft navigation, medical devices, direct life support devices, other systems where any failure could lead to injury, death or environmental damage, etc.)
5. Usage of certificates is in connection with fraud, pornography, obscenity, hate, defamation, harassment and other activity that is contrary to public policy.
6. Usage for man-in-the-middle (MITM) or traffic management of domain names or IPs that the certificate holder does not legitimately own or control.

emdha DSC CA certificates do not guarantee that the Subject is trustworthy, operating a reputable business or that the equipment into which the Certificate has been installed is free from defect, malware or virus.
emdha DSC CA certificates should be used only for the designated purposes, in addition to specific types and categories. An end subscriber certificate should not be used for CA function, like, to issue/sign a certificate under it. Similarly, the CA certificates are to be used only for CA function, and not to perform any end subscriber usage like document signing, etc.
More generally, certificates shall be used only to the extent where use is consistent with all applicable laws, statutes, orders, decrees, rules, regulations, and court judgements of this jurisdiction or governmental order of Kingdom of Saudi Arabia.

1.5. Policy Administration

1.5.1 Administration Organization

This CP/CPS is administered by BTC Policy Authority Committee (see section 1.3.1).

1.5.2 Contact Person

Queries regarding emdha DSC CA CP/CPS shall be directed to:

Email: policy@emdha.sa
Telephone: +966-11-4663000
Fax: +966-11-4613311

Any formal notices required by this CP/CPS shall be sent in accordance with the notification procedures specified in section 9.12.2 of this CP/CPS.

1.5.3 Person Determining CP Suitability for the Policy

The BTC PAC is responsible for approving the emdha DSC CA CP/CPS and establishing that the it conforms to the intended requirements in accordance with policies and procedures specified by Saudi National PKI.

1.5.4 CP/CPS Approval

Changes or updates to the emdha DSC CA CP/CPS document shall be made in accordance with the stipulations of Saudi e-Transactions act and bylaws and are subject to BTC PAC approval, as well as NCDC Approval.

1.6. Definitions and Acronyms

The terms used in this document shall have the meanings as defined in emdha DSC CA Glossary section which can be found at https://www.emdha.sa/.

2. Publication and Repository Responsibilities

2.1. Repositories

emdha DSC CA certificate(s),issued end-user or subscriber certificates, revocation lists will be published in repositories. emdha DSC CA shall operate high-availability repositories to support emdha DSC CA's operations. The repositories shall be available for public internet access through HTTP and HTTPS on a 24x7 basis.

2.1.1 Repository Obligations

Repositories shall support:

- Appropriate standard-based access protocols;
- Availability of the information as required by the certificate information posting and retrieval stipulations of this CP/CPS; and
- Access control mechanisms, when necessary to protect the repository availability and information.

2.2. Publication of Certification Information

2.2.1 Publication of Certificates and Certificate Status

emdha DSC CA shall publish in the appropriate repository: CA Certificates, Subscriber Certificates and CRLs.

CAs shall provide relying parties with information on how to find the appropriate repository to check certificate status and OCSP within each issued certificate.

2.2.2 Publication of CA Information

This CP/CPS shall be made available to all emdha DSC CA PKI participants at https://www.emdha.sa. This website is the only source for up-to-date documentation and emdha DSC CA reserves the right to publish newer versions of the documentation without prior notice.

Additionally, emdha DSC CA will publish an approved, current and digitally signed version of the emdha DSC CA CP/CPS.

The information published through this website resource is the only authoritative source for:

- Production CA Certificates;
- The certificate revocation list (CRL) for emdha DSC CA;
- Test websites for the CA Certificates (wherever applicable)
- CP/CPS Document.
- Relying Party Agreements.

2.2.3 Interoperability

Pointers to repository information in CA and end entity Certificates shall only contain valid Uniform Resource Identifiers (URIs) that are accessible by relying parties. The extensions containing such URIs shall comply to the RFC 5280 specifications.

2.3. Time or Frequency of Publication

CA and subscriber certificates are published promptly following their generation and issuance. CRL information shall be published as set in section 4.9.7.

This CP/CPS shall be reviewed and/or updated at least annually. This CP/CPS and any subsequent changes shall be made available to the participants as set forth in section 2.2.2 within 15 days of approval by the BTC PAC and NCDC.

This CP/CPS is provided as public information on emdha DSC CA official website https://www.emdha.sa. Public documents are only valid if they are published as a PDF, digitally signed by the PAC.

The OCSP responder(s) will immediately report a certificate that has been revoked as set in section 4.9.9.

2.4. Access Controls on Repositories

The information published in emdha DSC CA online repository is publicly accessible information and, has been provided with unrestricted read-only access to the contents of the repository. emdha DSC CA shall put in place sufficient safeguards, logical and physical, to prevent any unauthorized write access or alteration/modification of repository entries.

3. Identification and Authentication

3.1. Naming

3.1.1. Types of Names

Each Certificate must have a unique identifiable Distinguished Name (DN) according to the X.500 standard. Each Digital signature certificate shall contain an X.501 distinguished name in the Subject name field. Naming convention for emdha DSC CA is approved by the BTC PAC and NCDC as part of the CP/CPS approval.

Acceptable Subscriber name(s) are provided under Appendix A in this CP/CPS.

3.1.2. Need for names to be meaningful

Subscriber certificates issued pursuant to this CP/CPS are meaningful only if the names that appear in the certificates are understood, usable and meaningful for the Relying Parties. The common name in a certificate shall refer to the generally accepted personal name for individuals, legal name of the organization, a unit within an organization, any name legally owned or assigned to the organization.

The subject name contained in a emdha DSC CA certificate must be meaningful and be sufficiently discernable to unambiguously indicate the association existing between the name and the entity to which it belongs.

The emdha DSC CA DN (LDAP Notation) in the Issuer field of all certificates and CRLs that are issued will be:
CN=EMDHA DSC CA, O=Baud Telecom Company, C=SA
The certificate types supported by emdha DSC CA are covered in Certificate Types under Appendix-A.

3.1.3. Anonymity or Pseudonymity of Subscribers

emdha DSC CA may issue pseudonymous certificates pursuant to the approval of PAC, as long as the pseudonym(s) used are meaningful for the Relying party(ies).
No Stipulation for anonymous names for subscribers.

3.1.4. Rules for Interpreting Various Name Forms

The naming convention used by emdha DSC CA is ISO/IEC 9594 (X.500) Distinguished Name (DN).

3.1.5. Uniqueness of Names

Distinguished names shall be unique across the emdha DSC CA for a specific type of certificate. It is possible for a Subscriber to have two or more certificates with the same Subject Distinguished Name (DN). emdha DSC CA may, if necessary, insert additional numbers or letters to the Certificate Holder's Subject Common Name, or other attribute, in order to distinguish between two Digital Certificates that would otherwise have the same Subject Name.

3.1.6. Recognition, Authentication, and Role of Trademarks

Certificate applicants are prohibited from using names in their certificate application that infringe upon the Intellectual Property Rights of others. The emdha DSC CA however, does not verify whether a certificate applicant has Intellectual Property Rights in the name appearing in a certificate application.
Any name collisions or disputes regarding Certificates issued by emdha DSC CA shall be resolved as per BTC Complaint and Dispute Resolution Policy.

emdha DSC CA shall have the right to revoke an unexpired certificate upon receipt of a properly authenticated order from NCDC, an arbitrator or court of competent jurisdiction requiring the revocation of a Certificate or Certificates containing a Subject name in dispute.

Where permitted or required, the use of a trademark is reserved to the holder of that trademark.

3.2. Initial Identity Validation

3.2.1. Method to Prove Possession of Private Key

The subscriber private key will be generated only in FIPS 140-2 Level-2 or Level-3 certified hardware security module(s) for High Assurance Certificate. And subscriber private key with Low and Medium Assurance type certificates can be generated in the system or in FIPS 140-2 Level-2 or Level-3 certificated hardware security module(s).

The possession of the Private key, corresponding to the public key (which has to be listed in the Certificate), must be demonstrated by the certificate applicant, by submitting a PKCS #10 (CSR) request signed using the private key.

3.2.2. Authentication of Issuer Identity

Not Applicable.

3.2.3. Identity-Proofing of Individual Identity

3.2.3.1. Identity-Proofing of End User Subscribers

The Certificate subject is an individual, emdha DSC CA will validate the individual identity as per the applicable verification process for specific type of certificate. This shall be referred in Appendix B.

emdha DSC CA may issue certificates internally within the organization for its supporting roles, such as OCSP, etc. BTC PAC will verify information in the application, authenticity of the requesting representative and the representative's authorization to act in the assigned role.

3.2.3.2. Identity-Proofing of Device Subscribers

No stipulation.

3.2.3.3. Identity-Proofing of Organizational Entities

The Certificate subject is an organizational entity, then an authorized representative of the entity (Authorized Signatory) applies for a certificate. emdha DSC CA will authenticate the identity of this Authorized Signatory and the validation of authority with an acceptable identity proof and a reliable method of communication. Respective verification process applicable to authorized signatories is available in Appendix B.

3.2.4. Non-verified Subscriber Information

Non-verified information shall not be included in certificates issued under emdha DSC CA, unless specifically mentioned in the Certificate Types section in Appendix-A.

3.2.5. Criteria of Interoperation

No stipulation.

3.3. Identification and Authentication for Re-key Requests

For Subscriber Certificates, renewal is permitted by reuse of a previous certificate request to replace an expiring or expired Certificate. Subscribers have to undergo fresh identity-proofing process during initial certificate issue and subsequent renewals.

The maximum validity for Subscriber DSC is 36 months or the expiry date of the Issuing CA certificate, whichever comes earlier.

Re-key of certificates of DSC CA supporting roles such as OCSP, etc. may be performed as stipulated in the CA Operations Manual.

3.3.1. Identification and Authentication for Routine Re-Key

Re-keying is a process where new private key / key pair is generated by the subscriber and a request is made to provide certificate, with information similar to a previous certificate.

Subscribers may request Re-key any number of times during the validity period of the certificate. Rekeyed Certificate has a 'Valid Till' date which equals the 'Valid Till' date of the certificate that is being re-issued/replaced.

3.3.2. Identification and Authentication for Re-key After Revocation

emdha DSC CA shall issue fresh certificate to the subscriber only after the initial registration process described in Section 3.2 to obtain a new certificate.

3.4. Identification and Authentication for Revocation Requests

A request to revoke Keys may be submitted by the subscribers / persons authorized to do so under relevant contractual documentation or based on instruction received from a competent authority. Prior to the revocation of a Certificate, emdha DSC CA shall verify that the revocation has been requested by a subscriber authorized to request revocation.

Revocation requests shall be approved only on successful authentication. Approvals for revocation may be granted following a suitable challenge response such as logging into an account with a username and password, or proving possession of unique elements incorporated into the Certificate, email address, National ID/Resident Permit number or such similar.

Revocation of Certificates for emdha DSC CA supporting roles such as OCSP, etc. may be performed as stipulated in the CA Operations Manual.

4. Certificate Life-Cycle Operational Requirements

Communication among the CA, RA, and subscriber are implemented with requisite security services (i.e., source authentication, integrity, non-repudiation, or confidentiality) that commensurate with the assurance level of the certificate being managed.

4.1. Certificate Application

The applicant intending to obtain DSC from CA, should provide the following :

- 'Registration requirements' and 'Key activation requirements' as per Appendix B
- subscriber-consent for RKA to retrieve and provide KYC information to DSC CA
- accepts and agrees to be legally bound by the Subscriber Agreement
- accepts and agrees in total to this CP/CPS

Globally accepted practices shall be followed for accepting documents electronically. All applications are subject to review, approval, and acceptance by the Issuing DSC CA at its discretion.

On receipt of the request and information in the prescribed format, CA/RA carries out the verification of documents and Video and Mobile number verification if applicable. The detailed requirements for DSC applicant identity verification are specified in Appendix B.

A signed declaration by RA Officer performing the identity verification is recorded on the DSC application form that he or she verified the identity of the applicant.

Upon the approval of CA trusted person for DSC application request, the DSC is issued to the DSC applicant and will be published in the repository of the CA..

Certificate application for emdha DSC CA supporting roles such as OCSP, etc., shall be performed as stipulated in the CA Operations Manual.

4.1.1. Submission of Certificate Application

Please refer to above section 4.1

4.1.2. Enrollment Process and Responsibilities

Please refer to above section 4.1.

Process for subscribers	Responsibility
Identity Verification of the DSC Applicant	RA
Subscriber consent for KYC Information	RKA
Obtaining Acceptance and agreement of subscriber agreement and this CP/CPS	RA
Digitally-sign KYC Information	RKA
Verification and validation of RKA digital signature on KYC information	RA
Subscriber Key Generation and Certificate Signing Request	emdha DSC CA
Offline Key Generation and Certificate Signing Request	Subscriber
Certificate Issuance	emdha DSC CA

4.2. Certificate Application Processing

4.2.1. Performing Identity-proofing Functions

Please refer to above section 4.1.

4.2.2. Approval or Rejection of Certificate Applications

Certificate Applications submitted to the CA for processing could result in either approval or rejection based upon the DSC Applicant's meeting the requirements of this CP/CPS in Appendix B.

4.2.3. Time to Process Certificate Applications

No Stipulation.

4.3. Certificate Issuance

4.3.1. CA Actions During Certificate Issuance

Certificates are issued only after verifying required approvals and authorizations (including successful verification of digital-signatures on KYC Information, approvals and/or authorizations) that have been obtained, and the required identification and authentication steps have been successfully completed in accordance with section 4.1. Issued certificates are available for soft download or through crypto medium. If crypto medium is opted for the key generation and storage, the details such as make, model, serial number etc. are also recorded.

Upon successful verification, the CA will then verify that certificate fields and extensions are populated in accordance with the Appendix A and generate the certificate containing public keys, OIDs, dates, and other relevant information. After generation, verification, and subject to subscriber acceptance, emdha DSC CA publishes the certificate in the repository.

Certificate issuance for SIP, RKA and emdha DSC CA supporting roles such as OCSP, etc., shall be performed as stipulated in the CA Operations Manual.

4.3.2. Notification to Subscriber of Certificate Issuance

emdha DSC CA shall notify the Subscriber of the issuance of a certificate in a convenient and appropriate way based on information submitted during the enrolment process, most likely through email and internet link.

4.4. Certificate Acceptance

Prior to being able to use their digital certificate, the subscriber should confirm acceptance of the same. Until a digital certificate is accepted, it is not published in emdha DSC CA repository or otherwise made publicly available.

By accepting a certificate, the Subscriber:

- Agrees to be bound by the continuing responsibilities, obligations and duties imposed by this CP/CPS,
- Agrees to be bound by the Subscriber Agreement, and
- Represents and warrants that to its knowledge no unauthorized person has had access to the private key associated with the certificate, and
- Represents and warrants that the certificate information he/she has supplied during the registration process is truthful and has been accurately and fully published within the certificate.
- ASSUMES A DUTY TO RETAIN CONTROL OF THE PRIVATE KEY CORRESPONDING TO THE PUBLIC KEY CONTAINED IN THE CERTIFICATE, TO USE A TRUSTWORTHY SYSTEM AND TO TAKE REASONABLE PRECAUTIONS TO PREVENT THE PRIVATE KEY'S LOSS, EXCLUSION, MODIFICATION, OR UNAUTHORISED USE.

4.4.1. Conduct Constituting Certificate Acceptance

The DSC applicant must confirm acceptance of the certificate upon notification of issuance by the CA. Notification and link are sent to subscriber for downloading the certificate. The content of the certificate will be displayed to subscriber along with download option. Downloading the certificate constitutes the subscriber's acceptance of the certificate.

Alternatively, installing or otherwise taking delivery (through physical or electronic means via certificate delivered over link/download in the Issuing CA website or in email, etc) by the subscriber, or by an entity authorized/consented by subscriber, of a Digital Certificate constitutes acceptance of a Digital Certificate within emdha DSC CA.

The use of a digital certificate or the reliance upon a digital certificate signifies acceptance by that person of the terms and conditions of this CP/CPS and applicable agreements by which they irrevocably agree to be bound.

4.4.2. Publication of the Certificate by the CA

emdha DSC CAs shall publish a certificate by sending the certificate to the Subscriber and/or publishing in a suitable repository.

4.4.3. Notification of Certificate Issuance by the CA to Other Entities

No Stipulation.

4.5. Key Pair and Certificate Usage

4.5.1. Subscriber Private Key and Certificate Usage

Subscribers are liable to protect their private keys from access by any other party. For individual Signature certificates, subscribers are required to generate key pair in FIPS 140-2 Level-2 or Level-3 crypto devices.

Subscribers are also required to use their private keys for the purposes as constrained by the extensions (such as key usage, extended key usage, certificate policies, etc.) in the certificates issued to them.

Subscribers shall ensure the use of certificates exclusively for legal and authorized purposes in accordance with the terms and conditions of the subscriber agreement, this CP/CPS, and applicable laws.

4.5.2. Relying Party Public Key and Certificate Usage

The Relying Party (RP) Agreement becomes effective when the RP relies on information provided by the emdha DSC CA or a subscriber regarding a specific transaction that the RP uses to accept or reject their participation in the transaction. The RP's use of the Repository, or any CRL or OCSP services is governed by the RP Agreement and emdha DSC CA CP/CPS. The RP is solely responsible for deciding whether or not to rely on the information in a certificate provided by emdha DSC CA.

Relying Parties must also at the minimum must assess:

- The use of digital certificate is not prohibited by this CP/CPS.
- The appropriateness of the use of the Digital Certificate for any given purpose
- That the Digital Certificate is being used in accordance with its Key-Usage field extensions.
- That the Digital Certificate is valid at the time of reliance by reference to Online Certificate Status Protocol or Certificate Revocation List Checks.

The RP bears the legal consequences of any failure to comply with the obligations set in the RP agreement or the aforementioned steps.

4.6. Certificate Renewal

Certificate renewal is the issuance of a new certificate without changing the public key in the certificate. Certificate renewal shall not be allowed for emdha DSC CA issued certificates.

4.7. Certificate Re-Key

Re-keying a certificate (key update) refers to the issuance of new certificate with a different key pair and serial number while retaining other subject information from old certificate.

The new Certificate may be assigned a different validity period and/or signed using a different issuing CA private key and/or use a different approved signing algorithm.

Certificate Re-Key for SIP, RKA and emdha DSC CA supporting roles such as OCSP, etc., shall be performed as stipulated in the CA Operations Manual.

4.7.1. Circumstances for Certificate Re-key

Manual Re-key of certificates for SIP, RKA, Subscribers and emdha DSC CA supporting roles such as OCSP, etc. shall be performed as stipulated in the CA Operations Manual.

BTC PAC may decide to perform manual certificate re-key with or without revocation based on a risk-assessment, or based on business requirements for certificate validity period of SIP, RKA, Subscriber and emdha DSC CA supporting roles such as TOCSP, etc.

4.7.2. Who can Request a Certificate Re-key

In accordance with the conditions specified in previous section, Certificate re-key may be requested by BTC PAC for emdha DSC CA supporting roles such as OCSP, etc.

SIP, RKA, Subscriber may also request Re-Key of their own certificate(s).

4.7.3. Processing Certificate Re-keying Requests

Re-key requests for SIP, RKA, Subscriber and emdha DSC CA supporting roles such as OCSP, etc. shall follow a process similar to new issuance, as defined in CA Operations Manual.

4.7.4. Notification of Re-Keyed Certificate Issuance to Subscriber

The notification to subscriber on new certificate issuance (for re-key certificate) shall be same as the process defined in this CP/CPS for new certificate issuance notification to Certificate Holder. Refer section 4.3.2.

4.7.5. Conduct Constituting Acceptance of a Re-keyed Certificate

The conduct constituting the certificate acceptance for re-key shall be same as the process defined in this CP/CPS for new certificate acceptance. Refer section 4.4.1.

4.7.6. Publication of the Re-keyed Certificate by the CA

The publication of certificate in case of re-key shall be same as the process defined in this CP/CPS for new certificate publication. Refer section 4.4.2.

4.7.7. Notification of Certificate Issuance by the CA to Other Entities

No Stipulation.

4.8. Certificate Modification

Certificate modification for SIP, RKA, Subscriber Certificates and emdha DSC CA supporting roles such as OCSP, etc. will be accomplished through Certificate re-key as specified in section 4.7.

The emdha DSC CA shall not support other forms of Certificate modification.

4.9. Certificate Revocation and Suspension

The CA will notify participants of certificate revocation or suspension through access to the CRL in the CA repository and/or OCSP.

emdha DSC CA will revoke a Digital Certificate upon receipt of a valid request and may provide automated mechanisms for requesting and authenticating revocation requests. A revocation request may be sent by the Certificate Holder or Affiliated Organization through any one or many of the following modes, as may be provided by emdha DSC CA:

- Submit the revocation request via the Issuing CA Support Line
- Issuing CA website
- Contact administrators of emdha DSC CA direct

Certificate Holders or Affiliated Organization may use a passphrase or any kind of shared secret or any other form of subscriber authentication mechanism, that will be used to activate the revocation process. If revocation is requested by someone other than an authorized representative of the Subscriber or Affiliated Organization, the emdha DSC CA shall investigate the alleged basis for the revocation request and take appropriate action.

4.9.1. Circumstance for Revocation of a Certificate

The following reasons identify the need for a certificate to be revoked:

- Contravened any provisions of the Saudi e-Transactions Act and Bylaws made there under;
- The Subject has failed to meet its obligations under this CP/CPS or any other applicable Agreements, regulations, or laws;
- BTC PAC determines that revocation of a Certificate is in the best interest of Saudi National PKI;
- BTC PAC determines that a Certificate was not issued correctly in accordance with this CP/CPS;
- The private key corresponding to the public key in the certificate has been lost, disclosed without authorization, stolen or compromised in any way;
- There has been an improper or faulty issuance of a certificate due to:
  - A material prerequisite to the issuance of the Certificate not being satisfied;
  - A material fact in the Certificate is known, or reasonably believed, to be false.
- BTC PAC requests revocation of SIP, RKA, Subscriber or emdha DSC CA supporting roles such as OCSP , etc.;
- SIP, RKA, Subscriber requests revocation of their own certificate.

4.9.2. Who Can Request Revocation of a Certificate

In general, a certificate subject, human supervisor of a human subject (for organizational user), Human Resources (HR) person for the human subject (for organizational user), or CA, may request revocation of a certificate.

The following entities can also request revocation of a certificate:

- NCDC can request the revocation of any certificate issued by emdha DSC CA;
- BTC PAC can request the revocation of any certificates issued under its authority;
- emdha DSC CA can request the revocation of certificate issued to emdha DSC CA supporting roles such as OCSP, etc.;
- Subscriber for their own certificate, if any certificates/individuals are suspected or known for key compromise, affiliation change or cessation of operation/employment;
- A legal, judicial or regulatory agency in Saudi Arabia, within applicable laws and in coordination with BTC PAC.

If any request for revocation cannot be resolved, the request is subject to the Complaint and Dispute Resolution process described in the BTC Complaints and Dispute Resolution Policy.

4.9.3. Procedure for Revocation Request

A request to revoke a certificate shall identify the certificate to be revoked, explain the reason for revocation, and allow the request to be authenticated (e.g., digitally or manually signed). CA may perform Telephonic verification and video verification to ensure the identity of the subscriber.

Upon receipt of a revocation request, CA authenticates the request and then revokes the certificate.
Detailed procedure for revocation of SIP, RKA emdha DSC CA supporting roles such asOCSP, etc. is provided in the CA Operations Manual.

4.9.4. Revocation Request Grace Period

Revocation request grace period is not permitted once a revocation request has been verified and approved.

4.9.5. Time within which CA must Process the Revocation Request

emdha DSC CA shall process authorized revocation requests within seven days.

4.9.6. Revocation Checking Requirements for Relying Parties

Relying Parties should comply with the signature validation requirements defined in the Relying Party Agreement.

4.9.7. CRL Issuance Frequency

emdha DSC CA will publish its CRLs at least once every eight days, and immediately at the time of any Certificate revocation.

4.9.8. Maximum Latency of CRLs

CRLs shall be published in the Repositories within 30 minutes of Certificate revocation.

4.9.9. Online Revocation Checking Availability

emdha DSC CA shall make CRLs available in repositories as described in section 2.1.

emdha DSC CA shall also provide access to an OCSP Responder covering the certificates they issue.

4.9.10. Online Revocation Checking Requirements

emdha DSC CA shall make its Certificate status information available through an OCSP responder.

4.9.11. Other Forms of Revocation Advertisements Available

emdha DSC CA shall not provide other forms of revocation advertisements.

4.9.12. Special Requirements Related to Key Compromise

Certificate shall be revoked based on the procedure indicated in this CP/CPS.

emdha DSC CA discovers, or has a reason to believe, that there has been a compromise of the private key of the emdha DSC CA, it will immediately declare a disaster and invoke emdha DSC CA business continuity plan.

emdha DSC CA will,

(1) determine the scope of certificates that must be revoked,
(2) publish a new CRL at the earliest feasible time,
(3) use reasonable efforts to notify NCDC, subscribers and potential relying parties that there has been a key compromise, and
(4) generate new CA key pair, subject to approval from BTC PAC.

4.9.13. Circumstances for Certificate Suspension

BTC PAC may revoke for one of the circumstances described in Section 4.9.1, the emdha DSC CA may suspend the suspected certificate pending completion of investigation.

Suspension will be permitted in the event that a subscriber's token holding private key is temporarily unavailable to them.

4.9.14. Who Can Request Suspension

Same as 4.9.2.

The request is subject to the Complaint and Dispute Resolution process described in the BTC Complaint and Dispute Resolution Policy.

4.9.15. Procedure for Suspension Request

A request to suspend a certificate shall identify the certificate to be suspended, explain the reason for suspension, and allow the request to be authenticated (e.g., digitally or manually signed).

The reason code CRL entry extension will be populated with "certificateHold" by CA.

Detailed procedure for suspension of SIP, RKA or emdha DSC CA supporting roles such as OCSP, etc. is provided in the CA Operations Manual.

4.9.16. Limits on Suspension Period

The period for which a Certificate shall be suspended will be defined by the BTC PAC, but shall not exceed ninety (90) days.

4.9.17. Circumstances for Terminating Suspended Certificates

Suspended certificate of Subscriber has not removed from hold (suspension) within the "limits of suspension period", the certificate shall be revoked for the reason of "Key Compromise". In order to mitigate the threat of unauthorized person removing the certificate from hold, the subscriber identity will be authenticated in person using initial identity proofing process described in Section 3.2.3.

A suspended Certificate is reactivated when BTC PAC or the Subscriber that requested the suspension of a Certificate is satisfied that the circumstances leading to the suspension are no longer valid. Once reactivated, the certificate will be valid for the remainder of its initial life time.

A suspended Certificate is revoked when BTC PAC or the entity which requested the suspension of a Certificate is satisfied that the circumstances leading to the suspension are indeed valid.

When the period for suspension has reached its maximum duration without resolution, the certificate shall be revoked.

4.9.18. Procedure for Terminating the Suspension of a Certificate

A request to reinstate a suspended certificate shall identify the certificate to be unsuspended, explain the reason for unsuspension, and allow the request to be authenticated (e.g., digitally or manually signed). Detailed procedure for reinstatement of SIP, RKA, emdha DSC CA supporting roles such as OCSP, etc. is provided in the CA Operations Manual.

4.10. Certificate Status Services

The status of public certificates is available from CRLs in the repositories and via OCSP responder(s). Revocation entries on a CRL or OCSP response shall not be removed until after the expiry of the revoked certificate.

4.11. End of Subscription

No stipulation.

4.12. Key Escrow and Recovery

4.12.1. Key Escrow Policy and Practices

Signing keys will not be escrowed for the emdha DSC CA. emdha DSC CA does not allow decryption keys. emdha DSC CA does not offer key escrow services to Subscribers.

4.12.2. Session Key Encapsulation and Recovery Policy and Practices

Not applicable.

5. Facility Management and Operational Controls

5.1. Physical Security Controls

emdha operates the emdha DSC CA and Repositories at Tier III qualified data center, with appropriate physical and procedural access controls for all hardware and software sub-systems used in the issuance and revocation of certificates. emdha limits access to sensitive CA zones to personnel in Trusted Roles (see section 5.2.1 of this CP/CPS).

emdha DSC CA is co-located in a third-party data center and follows the physical security requirements specified as below:

- Permit only authorized access to the hardware;
- Store all removable media and paper containing sensitive plain-text information in secure containers;
- Monitor, either manually or electronically, for unauthorized intrusion at all times; and
- Maintain and periodically inspect access logs.

A security check of the facility housing the CAs equipment shall occur on a regular basis.

5.1.1. Site Location and Construction

The location and construction of the facility housing the emdha DSC CA equipment is consistent with facilities used to house high value, sensitive information. The site location and construction, when combined with other physical security protection mechanisms such as guards and multi-factor access controls, provides robust protection against unauthorized access to the CA equipment and records.

Main Site (Primary) Location: Riyadh, Saudi Arabia

Alternate Site (DR Site) Location: Al Khobar, Saudi Arabia (400+ KMs away from Main Site)

5.1.2. Physical Access

BTC PKI systems are protected by at least four zones of physical security, with access to the lower zone required before gaining access to the higher and more secure zone(s). Progressively restrictive physical access privileges control access to each zone. Sensitive CA operational activity, any activity related to the lifecycle of the certification process such as authentication, verification, and issuance, occur within very restrictive physical zones. Physical access is automatically logged and video recorded. Additionally, zones enforce individual access control through the use of two factor authentication, one of them being biometric. Unescorted personnel, including un-trusted employees or visitors, are not allowed into such secured areas unless accompanied by trusted personnel.

Main Site is protected by seven zones of physical security. More details are provided in the Physical Security Documentation.

emdha DSC CA has implemented policies and procedures to ensure that the physical environments in which the emdha DSC CA systems are installed maintain a high level of security:

- CA systems are installed in a secure facility that is isolated from outside networks, with all access controlled;
- CA is separated into a series of progressively secure areas; and
- The entrances and exits from the secure areas are under constant video surveillance and all systems that provide authentication, as well as those that record entry, exit and network activity, are in secured areas.

The security techniques employed are designed to resist a large number and combination of different forms of attack. The mechanisms used include:

- Perimeter alarms
- Closed circuit television
- Electronic access controls using two-factor authentication
- Multi-person access for most secure zones
- Human guards

To prevent tampering, cryptographic hardware is stored in the most secure area of the BTC/emdha PKI datacenter, with access limited to authorized personnel.

Human guards continually monitor the facility housing the CA equipment on a 24x7x365 basis. The BTC/emdha PKI datacenter facility is never left unattended.

The security mechanisms employed are commensurate with the level of threat in the equipment environment.

5.1.3. Power and Air Conditioning

Power to the BTC/emdha PKI datacenter is delivered through 2 different active-active feeds. Sufficient power capacity is available to the datacenter. Sufficient resilience is available in the Tier III datacenter using battery backup and N+1 generator to provide sufficient time to respond and act on any power related events.

The cooling system is designed as N+1 according to uptime institute's tier 3 requirements. Sufficient monitoring for cooling systems is in place to ensure optimum cooling is available to the aisle/rack level.

5.1.4. Water Exposure

emdha DSC CA shall ensure that CA equipment is installed such that it is not in danger of exposure to water (e.g., on elevated floors).

5.1.5. Fire Prevention and Protection

The CA equipment is housed in a facility with appropriate fire suppression and protection systems. Some of the measures deployed include:

- Fire-resistant walls and pillars;

- Modern FM-200 fire suppression systems to detect and suppress fire with appropriate 24x7 monitoring
- The controls implemented comply meet all applicable safety regulations of the Kingdom of Saudi Arabia.

5.1.6. Media Storage

emdha DSC CA shall ensure that CA media is stored so as to protect it from accidental damage (such as water, fire, electromagnetic, etc.). Media that contains archive or backup information is duplicated in an alternate location with reasonable distance between the two sites.

5.1.7. Waste Disposal

Sensitive media and documentation that are no longer needed for operations are destroyed using appropriate disposal processes. For example, sensitive paper documentation is shredded, burned, or otherwise rendered unrecoverable. HSM and related devices are physically destroyed or zeroized in accordance with the manufacturers' guidance prior to disposal. Other electronic media is physically destroyed prior to disposal.

5.1.8. Off-Site Backup

Full system backups of CAs, sufficient to recover from system failure, shall be made on a periodic schedule as per procedures approved by BTC PAC.

5.2. Procedural Controls

5.2.1. Trusted Roles

A trusted role is one whose incumbent performs functions that can introduce security problems if not carried out properly, whether accidentally or maliciously. The people selected to fill these roles must be extraordinarily responsible or the integrity of the PKI is weakened. The functions performed in these roles form the basis of trust for all uses of the emdha DSC CA.

Trusted roles and personnel assigned to each trusted role are defined in the BTC Trusted Roles document. Roles specific to emdha DSC CA may also be referred to as L2CA roles.

5.2.2. Number of Persons Required per Task

emdha DSC CA shall ensure separation of duties for critical CA functions to prevent one person from maliciously using the PKI systems without detection. Each user's system access is limited to those actions which are required to fulfill their responsibilities.

A single person may be sufficient to perform tasks associated with a role, except for the activation of the CA's signing Private Key. Activation of the CA's signing Private Key shall require actions by at least two individuals. Two-role-authorization, split-knowledge and ownership techniques such as split-password's and M-Of-N tokens shall be deployed to perform any critical CA signing key operations, key backup or key recovery operation.

5.2.3. Identity-proofing for Each Role

An individual shall identify and authenticate himself before being permitted to perform any actions set forth above for that role or identity.

5.2.4. Separation of Roles

Role separation, when required, may be enforced either by the CA equipment, or procedurally, or by both means.

Separation of roles is identified in the BTC Trusted Roles document.

5.3. Personnel Controls

5.3.1. Background, Qualifications and Experience Requirements

All persons filling trusted roles shall be selected on the basis of skills, experience, loyalty, trustworthiness, and integrity. The requirements governing the qualifications, selection and oversight of individuals who operate, manage, oversee, and audit the CA are set forth in the BTC Trusted Roles document.

While performing any critical operation, one of the trusted roles should be held by a Saudi Citizen.

5.3.2. Background Check and Clearance Procedures

emdha DSC CA conducts background investigations for all CA personnel (trusted roles) positions. Background check shall take into account the following:

- A check (for completeness and accuracy) of the applicant's CV;
- Independent identity check (National ID card, Passport or similar document);
- Availability of satisfactory character reference, i.e. one business and one personal;
- Confirmation of claimed academic and professional qualifications;
- Interviews with references shall be done as required; and
- Security clearance.

Security clearance shall be repeated every 3 years for personnel holding trusted roles.

5.3.3. Training Requirements

emdha DSC CA shall ensure that all personnel receive appropriate training. Such training shall address relevant topics such as PKI and Information security concepts, security requirements, operational responsibilities and associated procedures.

The RA and CA Officers engaged in Certificate issuance shall be given detailed training to perform their tasks. emdha DSC CA shall design examination based on the training which is to be qualified by each CA Officer.

Documentation of all personnel who received training and the level of training completed shall be maintained by the emdha DSC CA.

5.3.4. Retraining Frequency and Requirements

Individuals responsible for PKI roles are made aware of changes in the CA operation. Any significant change to the operations shall have a training/awareness plan, and the execution of such plan shall be documented.

emdha DSC CA shall review and update its training program at least once every two years to accommodate changes in the CA system.

5.3.5. Job Rotation Frequency and Sequence

No stipulation.

5.3.6. Sanctions for Unauthorized Actions

emdha DSC CA shall take appropriate administrative and disciplinary actions against personnel who perform unauthorized actions (i.e., not permitted by the CP/CPS and/or other procedures) involving the CA or its associated components.

5.3.7. Contracting Personnel Requirements

emdha DSC CA may employ independent contractors as may be necessary. When independent contractors are employed, they will be subjected to the same process, procedures and controls as prescribed in this document under 'Personnel Controls'.

5.3.8. Documentation Supplied to Personnel

emdha DSC CA will make available to its personnel its CP/CPS, and any relevant documents required to perform their jobs competently and satisfactorily.

5.4. Audit Logging Procedures

emdha DSC CA will implement and maintain Trustworthy Systems to preserve an audit trail for material events and for key life cycle management, including key generation, backup, storage, recovery, destruction and management of cryptographic devices, the CA and OCSP Responder.

5.4.1. Types of Events Recorded

emdha DSC CA shall ensure recording in audit log files all events relating to the security of the CA system hosted in its data center. All security audit capabilities of the CA operating system and CA applications shall be enabled. Such events include, but are not limited to:

1. CA key lifecycle management events, including:
    a. Key generation, backup, storage, recovery, archival, and destruction; and
    b. Cryptographic device lifecycle management events.

2. CA and Subscriber Certificate lifecycle management events, including:
    a. Certificate requests, renewal, and re-key requests, and revocation;
    b. All verification activities stipulated in these Requirements and the CA's Certification Practice Statement;
    c. Date, time, phone number used, persons spoken to, and end results of verification telephone calls;

d. Acceptance and rejection of certificate requests;
e. Issuance of Certificates; and
f. Generation of Certificate Revocation Lists and OCSP entries.

3. Security events, including:
   a. Successful and unsuccessful PKI system access attempts;
   b. PKI and security system actions performed;
   c. Security profile changes;
   d. System crashes, hardware failures, and other anomalies;
   e. Firewall and router activities; and
   f. Entries to and exits from the CA facility.

Log entries MUST include the following elements:

- Date and time of entry;
- Identity of the person making the journal entry; and
- Description of the entry.

All logs, whether electronic or manual, must contain the date and time of the event and the identity of the Entity which caused the event. The CA shall also collect, either electronically or manually, security information not generated by the CA system such as:

- Physical access logs;
- System configuration changes and maintenance;
- CA personnel changes;
- documentation relating to certificate requests and the verification;
- documentation relating to certificate revocation;
- Discrepancy and No compromise reports;
- Information concerning the destruction of sensitive information;
- Current and past versions of all Certificate Policies;
- Current and past versions of Certification Practice Statements;
- Vulnerability Assessment Reports;
- Threat and Risk Assessment Reports;
- Compliance Inspection Reports; and
- Current and past versions of Agreements.

5.4.2. Frequency of Processing Data

Audit logs are required to be processed in accordance with Audit Trails and Verification mentioned in the IT Security policies and procedure manual.

5.4.3. Retention Period for Security Audit Data

emdha DSC CA shall retain all system generated (electronic) and manual audit records onsite for a period not less than six months from the date of creation.

Video recording of CA facility access will be retained for a minimum of 90 days.

5.4.4. Protection of Security Audit Data

emdha DSC CA shall protect the electronic audit log system and audit information captured electronically or manually from unauthorized viewing, modification, deletion or destruction. This can be achieved by:

- Read access to the journal information is granted to personnel requiring this access as part of their duties;
- Only authorized roles can obtain access; and
- The journal is stored in appropriate database and access to the database is protected against unauthorized access by the application and through special security measures on the operating system level.

5.4.5. Security Audit Data Backup Procedures

emdha DSC CA shall back up all audit logs and audit summaries. Detailed policy and standard operating procedures are provided in IT Security Policies and Procedures Manual.

5.4.6. Security Audit Collection System (Internal or External)

The audit collection system is detailed in IT Security Policies and Procedures Manual.

5.4.7. Notification to Event-Causing Subject

Event-causing subject are not notified.

5.4.8. Vulnerability Assessments

Vulnerability assessments of security controls shall be performed by emdha DSC CA for its CA and other supporting systems hosted in its data center at least every three months, and after any significant system or network changes as determined by the CA. Such assessments shall be performed on public and private addresses for the emdha DSC CA and associated components.

emdha DSC CA security program shall include an annual Risk Assessment which includes identification of foreseeable internal and external threats, assess the likelihood and potential damage of these threats and assess the sufficiency of the policies, procedures, information systems and technology. Based on the Risk Assessment exercise, emdha DSC CA shall develop, implement, and maintain a security plan to control the risks identified during the Risk Assessment, commensurate with the sensitivity of the Certificate Data and Certificate Management Processes.

Apart from this BTC/emdha PKI datacenter(s) are constantly (24x7) monitored, and all attempts to gain unauthorized access to any of the services are logged and analyzed.

BTC/emdha performs third party penetration testing on public IPs for hosted CA infrastructure at least once a year and after infrastructure or application upgrades or modifications that the CA determines are significant.

5.5. Records Archival

5.5.1. Types of Events Archived

CA archive records shall be sufficiently detailed to establish the proper operation of the CA, or the validity of any certificate (including those revoked or expired) issued by the CA.

These include:

- Audit logs generated by the CA software;
- Agreements;
- Records pertaining to identification and authentication information;
- Physical access logs;
- System configuration changes and maintenance;
- CA personnel changes;
- Discrepancy and compromise reports;
- Information concerning the destruction of sensitive information;
- Current and past versions of Certificate Policies and Certification Practice Statements;
- Vulnerability Assessment Reports, and associated remediation reports;
- Threat and Risk Assessment Reports;
- Compliance Inspection Reports;
- Documents identifying all personnel who received CA related training and the level of training completed;
- emdha DSC CA shall archive any necessary keys and passwords for a period of time sufficient to support the functionalities; and

The CA shall make these audit logs available to its Qualified Auditor upon request.

5.5.2. Retention Period for Archive

emdha DSC CA's minimum retention period for archive data is established at 10 years.
Applications needed to process the archive data shall also be maintained for the archival retention period.

5.5.3. Protection of Archive

Only authorized individuals shall be permitted to review the archive. The contents of the archive shall not be released except as determined by BTC PAC, or as required by law. Records and material information relevant to use of, and reliance on, a certificate shall be archived. Archive media shall be stored in a secure storage facility separate from the component itself. Any secondary site must provide adequate protection from environmental threats such as temperature, humidity and magnetism.

5.5.4. Archive Backup Procedures

Backup of archive is detailed in IT Security Policies and Procedures Manual.

5.5.5. Requirements for Time-Stamping of Records

Certificates, CRLs, and other revocation database entries shall contain time and date information obtained from the BTC/emdha PKI time-server(s). System logs shall be time stamped and all connected systems shall use a dedicated time server to maintain synchronized time.

The system time of all servers is synchronized with official time-source. BTC/emdha PKI time-source is also synchronized with the GPS clock as a backup. Further, there is a procedure in place that checks and corrects drift in the real time clock.

5.5.6. Archive Collection System (Internal or External)

The type of Archive Collection System, whether internal or external, is specified in IT Security Policies and Procedures Manual.

5.5.7. Procedures to Obtain and Verify Archive Information

As specified in IT Security Policies and Procedures Manual.

5.6. Key Changeover

The CA system utilized by the emdha DSC CA supports key rollover, allowing CA keys to be changed periodically, as required. This may be done to minimize risk to the integrity of the emdha DSC CA or based on business requirements for certificate validity period of its subscribers. Once changed the new key is used for certificate signing purposes.

CA provides reasonable notice to the subscriber's relying parties of any change to a new key pair used by CA to sign digital certificates under its trust hierarchy. The subscribers generate a new private-public key pair and submit the public key along with the new application to the CA for generating a new Certificate, preferably before the existing certificate expires.

The unexpired older keys are used to sign CRL's until all certificates signed by the unexpired older private key have expired. Old and unexpired CA signing keys, if retained for signing CRLs shall be protected just as the new key.

5.7. Compromise and Disaster Recovery

5.7.1. Incident and Compromise Handling Procedures

If emdha DSC CA suspects or detects a potential hacking attempt or other form of compromise to the CA, it shall perform an investigation in order to determine the nature and the degree of damage. If the CA key is suspected of compromise, the procedures outlined in CA Operations Manual shall be followed. Otherwise, the scope of potential damage shall be assessed in order to determine if the CA needs to be rebuilt, only some certificates need to be revoked, and/or the CA key needs to be declared compromised. BTC PAC shall be notified in case of:

- Suspected or detected compromise of the CA system;
- Physical or electronic attempts to penetrate the CA system;
- Denial of Service attacks on a CA system component;
- Any incident preventing the CA from issuing a CRL within 24 hours of the time specified in the next update field of its currently valid CRL.

5.7.2. Computing Resources, Software, and/or Data Are Corrupted

emdha DSC CA maintains backup copies of hardware, system, databases, and private keys in order to rebuild the CA capability in case of software and/or data corruption. Such procedures require appropriate escalation, incident investigation, and incident response. If necessary, Business Continuity procedures will be enacted.

5.7.3. CA Private Key Compromise Recovery Procedures

Recovery procedure is as specified in CA Operations Manual.

5.7.4. Business Continuity Capabilities after a Disaster

emdha DSC CA has developed robust Business Continuity Management System for critical PKI services to provide the minimum acceptable level of assurance to its subscriber for service availability.

All emdha DSC CA critical infrastructure equipment at the primary site have built-in hardware fault-tolerance, and configured to be highly available with auto-failover switching. emdha DSC CA currently maintains copies of backup media and infrastructure system software, which include but are not limited to: PKI services related critical data; database records for all certificates issued and audit related data, at its offsite business continuity and disaster recovery storage facilities.

emdha DSC CA Business Continuity Management System (BCMS) demonstrates the capability to restore or recover critical PKI services at the primary site within twenty-four (24) hours in the event of service(s) non-availability.

Business Continuity Management components at emdha DSC CA are being regularly tested, verified, and updated to be operational to address crisis situation in the event of a disruption. For security reasons details of these plans are not publicly available.

emdha DSC CA business continuity plan includes:

- Conditions for activating the plan;
- Emergency procedures;
- Fall-back procedures;
- Resumption procedures;
- A maintenance schedule for the plan;
- Awareness and education requirements;
- The responsibilities of the individuals;
- Recovery time objective (RTO);
- Regular testing of contingency plans;
- The CA's plan to maintain or restore the CA's business operations in a timely manner following interruption to or failure of critical business processes;
- A requirement to store critical cryptographic materials (i.e., secure cryptographic device and activation materials) at an alternate location;
- Acceptable system outage and recovery time;
- Procedure and frequency of backup to be taken for essential business information and software; and
- Procedures for securing its facility to the extent possible during the period of time following a disaster and prior to restoring a secure environment either at the original or a remote site.

emdha DSC CA has developed recovery plans to mitigate the effects of any kind of natural, man-made or equipment failure related disaster.

emdha DSC CA has implemented an alternate recovery site as per industry standards to provide full recovery of critical PKI services within five days following a disaster at the primary site. emdha DSC CA Business Continuity Policy contains further details.

5.8. CA or RA Termination

5.8.1. CA Termination

No Stipulation.

5.8.2. RA Termination

No Stipulation.

6. Technical Security Controls

6.1. Key Pair Generation and Installation

6.1.1. Key Pair Generation

Key pair generation for CAs will be witnessed and attested to by a party separate from the Trusted Roles. Key Pair generation must be performed using trustworthy systems and processes that provide the required cryptographic strength of the generated keys, and prevent the loss, disclosure, modification, or unauthorized use of such keys. CA's shall use Hardware Security Modules (HSMs) for CA key generation and storage. HSM's shall be minimum FIPS 140-2 Level 3 validated.

emdha DSC CA key pair generation is performed by multiple trusted personnel using trustworthy systems and processes that provide security and required cryptographic strength for the generated keys.

emdha DSC CA key pair is generated in pre-planned Key Generation Ceremony. The activities performed in Key Generation Ceremony are video recorded, dated and signed by all individuals involved. These records are kept for audit and tracking purposes for a length of time deemed appropriate by BTC PAC.

6.1.2. Private Key Delivery to Subscriber

Subscriber private key is generated by the end subscriber and hence there is no delivery to the end subscribers. In the case of hardware based tokens, pre-formatted tokens are sent to the subscribers and the associated PIN is sent by an out-of-band process. The end user then uses the token and the client software provided to him to generate and store the private key and also initiates an online session with the CA server for certificate generation.

6.1.3. Public Key Delivery to Certificate Issuer

End user subscribers generate a PKCS#10 requests containing their public key and send it to the CA. This is accomplished using the client software which initiates an online session with the CA server and deliver the signed certificates to the subscriber.

6.1.4. CA Public Key Delivery to Subscribers and Relying Parties

emdha DSC CA shall ensure that Subscribers and Relying Parties receive and maintain the trust anchor (Saudi National Root CA) in a trustworthy fashion. Methods for trust anchor delivery may include:

- A trusted role loading the trust anchor onto Tokens delivered to Subscribers via secure mechanisms;
- Distribution of trust anchor through secure out-of-band mechanisms;
- Calculation and comparison of trust anchor hash or fingerprint against the hash made available via authenticated out-of-band sources; or

- Downloading trust anchor from websites secured with a currently valid certificate of equal or greater assurance level than the Certificate being downloaded and the site trust anchor already on the Subscriber system via secure means.
- Availability of CA certificate(s) in public repositories as described in section 2.1.

emdha DSC CA certificate(s) shall be published on the website https://www.emdha.sa which may be downloaded by subscribers or relying parties.

6.1.5. Key Sizes

Key pairs shall be of sufficient length to prevent others from determining the key pair's private key using cryptanalysis during the period of expected utilization of such key pairs. Key sizes are described as below for emdha DSC CA. All FIPS-approved signature algorithms shall be considered acceptable. Acceptable algorithms shall be maintained in accordance with the Saudi National PKI Policy.

All certificates issued shall use at least 4096-bit RSA keys OR at least NIST P-256 ECC keys, with Secure Hash Algorithm version (SHA-256) in accordance with FIPS 186-2 or equivalent.

TLS or other protocol providing similar security to accomplish any of the requirements of this CP/CPS shall use AES (minimum 128-bit key strength) for symmetric keys, and at least 4096-bit RSA or at least NIST P-256 ECC or equivalent for asymmetric keys.

The current emdha DSC CA key lengths for minimum key sizes are;

- emdha DSC CA Key Pair: RSA 4096 bits
- OCSP Key Pair: RSA 4096 bits
- Subscriber Key Pair: RSA 4096 bits or NIST P-256 ECC

6.1.6. Public Key Parameters Generation and Quality Checking

The HSM pseudo-random number generator is validated by NIST. Public key parameters prescribed are generated in accordance with industry best practices.

6.1.7. Key Usage Purposes

emdha DSC CA private key(s) shall be used for certificate and CRL signing.

6.2. Private Key Protection and Crypto-Module Engineering Controls

6.2.1. Cryptographic Module Standards and Controls

Cryptographic modules employed in emdha DSC CA shall comply with FIPS-PUB 140-2 "Security Requirements for Cryptographic Modules". The Hardware Security Modules (HSM's) used for key generation meet the requirements of FIPS 140-2 Level 3 to store the CA keys.

Cryptographic hardware used for subscriber key generation shall be at least FIPS 140-2 Level 2 compliant.

6.2.2. CA Private Key Multi-Person Control

Multi-person control of CA private key is achieved using an "m-of-n" split key knowledge scheme. emdha DSC CA keys can only be accessed on the physical and logical level by at least two trusted roles, and is achieved by M=2 in M-of-N scheme.

6.2.3. Private Key Escrow

Not Applicable.

6.2.4. Private Key Backup

6.2.4.1. Backup of CA Signing Private Key

emdha DSC CA signing Private Key shall be backed up under the same multi-person control as the original Signing Private Key. A second and third copy may be kept at CA backup locations for Business Continuity and Disaster Recovery. Procedures for emdha DSC CA signing Private Key backup shall be detailed in Backup and Restore Policy.

emdha DSC CA private keys that are physically transported from one facility to another shall remain confidential and maintain their integrity.

emdha DSC CA hardware containing CA private keys, and associated activation materials, shall be transported in a physically secure environment by authorized personnel in trusted roles, using multiple person controls, and using sealed tamper-evident packaging.

emdha DSC CA keys and associated activation materials shall be transported in a manner that prevents the key from being activated or accessed during the transportation event; and CA key transportation events shall be logged.

6.2.4.2. Backup of Subscriber Private Keys

emdha DSC CA is never in possession of Subscribers private signing keys.

6.2.5. Private Key Archival

emdha DSC CA shall maintain controls to provide reasonable assurance that archived CA keys remain confidential, secured, and shall never be put back into production.

6.2.6. Private Key Transfer into or from a Cryptographic Module

The cryptographic modules implemented by emdha DSC CA are validated to FIPS 140-2 Level 3 ensuring that the CA keys cannot be exported to less secure media.

emdha DSC CA keys can be cloned for secure backup from the master hardware cryptographic module to other hardware cryptographic module(s) using secure mechanisms so that they can be recovered if a major catastrophe destroys the production set of keys. Such backup or clones shall have the same level of authentication and access control as the production set.

6.2.7. Private Key Storage on Cryptographic Module

CA's Private Key shall be stored on FIPS 140-2 Level 3 validated cryptographic module in encrypted form.

6.2.8. Method of Activating Private Keys

CA's private key shall be activated by the main stakeholders and authorized personnel, as defined in CA Operations Manual, supplying their activation data. Such activation data shall be held on secure media and shall require the successful completion of a multi-person authentication process.

6.2.9. Methods of Deactivating Private Keys

CA's private key shall be deactivated by the main stakeholders and authorized personnel, as defined in CA Operations Manual.

6.2.10. Methods of Destroying Private Keys

Copies of CA private keys shall be destroyed as per Cryptographic Devices Lifecycle Management Policy and Procedure.

6.2.11. Cryptographic Module Rating

As described in section 6.2.1.

6.3. Other Aspects of Key Pair Management

6.3.1. Public Key Archive

The Public Key is archived as part of the certificate archive process.

6.3.2. Certificate Operational Periods and Key Usage Periods

The table below details key usage and certificate lifetime for the corresponding keys:

Key/Certificate	Maximum Validity Period
emdha DSC CA signing key and certificate	120 months or valid not beyond 2029, whichever is earlier
Subscriber Certificates	36 months or valid not beyond 2029, whichever is earlier
OCSP Certificates	60 Months or valid not beyond 2029, whichever is earlier

All certificates including subscriber certificates or any emdha DSC CA supporting role like OCSP etc. certificate end date shall not exceed the end date of its signing certificate (issuer).

6.4. Activation Data

6.4.1. Activation Data Generation and Installation

The CA cryptographic module activation data will be generated locally at the time of key generation by personnel in the trusted role and responsible for controlling the activation data.

6.4.2. Activation Data Protection

Written CA cryptographic module activation data is placed into tamper evident packages which are then stored within secure containers in a highly secured environment inside the BTC PKI Datacenter(s).

6.4.3. Other Aspects of Activation Data

No stipulation.

6.5. Computer Security Controls

6.5.1. Specific Computer Security Technical Requirements

The computer security functions may be provided by the operating system, or through a combination of operating system, software, and physical safeguards.

At a minimum, the datacenter(s) shall have following controls to ensure security of the systems:

- Hardened operating system;
- Software packages are only installed from a trusted software repository;
- Minimal network connectivity;
- Authentication and authorization for all functions;
- Strong authentication and role-based access control for all vital functions;
- Disk and/or file encryption for all relevant data; and
- Proactive patch management.

6.5.2. Computer Security Rating

No stipulation.

6.6. Life-Cycle Security Controls

6.6.1. System Development Controls

emdha DSC CA design, installation, and operation will be documented by qualified personnel. BTC Production personnel, with oversight by the BTC PAC and Quality Assurance team, will develop and produce appropriate qualification documentation establishing that emdha DSC CA components are properly installed and configured, and operate in accordance with the technical specifications.

emdha DSC CA shall undertake reasonable precautions to prevent malicious software being loaded on the CA equipment. Only applications necessary to perform the CA operations shall be implemented. The CA systems and software shall be scanned for malicious code on first use and periodically thereafter.

Hardware and software implementation, including updates and patches are performed by trained and trusted personnel.

6.6.2. Security Management Controls

The configuration of the emdha DSC CA systems as well as any modifications and upgrades shall be documented and controlled. There shall be a mechanism for detecting unauthorized modification to software or configuration. A formal change-management methodology shall be used for on-going maintenance of systems. Appropriate backups shall be taken before and after any major change to systems.

6.6.3. Life Cycle Security Ratings

No stipulation.

6.7. Network Security Controls

emdha DSC CA shall employ appropriate security measures to ensure they are guarded against denial of service and intrusion attacks. Also, it shall employ network security and firewall management, including port restrictions and IP address filtering.

Any boundary control devices used to protect the network on which PKI equipment is hosted shall deny all but the necessary services to the PKI equipment.

BTC/emdha PKI datacenter(s) use a network design of multiple security layers making use of several security technologies including network firewalls, application firewalls, and Endpoint protection technologies to protect network access to on-line CA's, Repository and OCSP Responder equipment.

Access shall not be provided to the emdha DSC CA through the public internet.

6.8. Time Stamping

Time stamping shall be supported for the Certificates, CRLs, and other revocation database entries containing time and date information from dedicated time-server(s) to maintain synchronized time.

Time derived from the time service shall be used for establishing the time of:

- Initial validity time of a Subscriber's Certificate;
- Revocation of a Subscriber's Certificate;
- Posting of CRL updates;
- OCSP response.

7. Certificate, CRL and OCSP Profiles

7.1. Certificate Profile

This section contains the rules and guidelines followed by this CA in populating X.509 certificates and CRL extensions. The Certificate profile for the Level-2-CAs is described in Appendix A.

7.1.1. Version Numbers

emdha DSC CA shall issue X.509 v3 certificates (populate version field with integer "2").

7.1.2. Certificate Extensions

Subscriber certificates may include any extensions as specified by RFC 5280 in a certificate, but must include those extensions required by this CP/CPS in Appendix A. Any optional or additional extensions shall be non-critical and shall not conflict with the certificate and CRL profiles defined in this CP/CPS.

7.1.3. Algorithm Object Identifiers

emdha DSC CA shall sign Certificates using sha256WithRSAEncryption algorithm (1.2.840.113549.1.1.11).

7.1.4. Name Forms

Certificates issued by emdha DSC CA contain the full X.500 distinguished name of the certificate issuer and certificate subject in the issuer name and subject name fields as per the "Name Types" table below. Distinguished names are in the form of an X.501 printable string.

Name Types

Issuer/Subject Fields	Category	OID	Datatype	Max Length
Common Name	Issuer Field	2.5.4.3	UTF8String	64 Characters
Organization Name	Issuer Field	2.5.4.10	UTF8String	64 Characters
Country Name	Issuer Field	2.5.4.6	Printable String	2 Characters
Locality Name	Subject Field	2.5.4.7	UTF8String	128 Characters
State or Province Name	Subject Field	2.5.4.8	UTF8String	128 Characters
Telephone Number	Subject Field	2.5.4.20	Printable String	128 Characters
Serial Number	Subject Field	2.5.4.5	Printable String	128 Characters
Organizational Unit	Subject Field	2.5.4.11	UTF8String	64 Characters
Pseudonym	Subject Field	2.5.4.65	Printable String	128 Characters
Title	Subject Field	2.5.4.12	UTF8String	64 Characters
Organization Identifier	Subject Field	2.5.4.97	UTF8String	64 Characters
Unique Identifier	Subject Field	2.5.4.45	Bit String	1024 bits

7.1.5. Name Constraints

No Stipulation.

7.1.6. Certificate Policy Object Identifier

As stated in Appendix A.

7.1.7. Usage of Policy Constraints Extension

It is expected that all members of the emdha DSC CA apply to this policy.

7.1.8. Policy Qualifiers Syntax and Semantics

No stipulation.

7.1.9. Processing Semantics for the Critical Certificate Policy Extension

Processing semantics for the critical certificate policy extension shall conform to X.509 certification path processing rules.

7.2. CRL Profile

Certificate Revocation Lists are issued in the X.509 version 2 format in accordance with RFC 5280. emdha DSC CA CRL Profile is as below:

Field	Content	Comment
Algorithm	**SHA256withRSAEncryption**	

Issuer	**CN= EMDHA DSC CA O=BAUD Telecom Company C=SA**	
This update	*<issue date>*	
Next update	*<issue date + 8 days>*	Or immediately upon revocation
AuthorityKeyIdentifier	*< emdha DSC CA's Subject Key Identifier>*	
CRL number	*<number>*	

7.2.1. Version Numbers

emdha DSC CA shall issue X.509 version two (v2) CRLs (populate version field with integer "1").

7.2.2. CRL and CRL Entry Extensions

Critical private extensions shall be interoperable in their intended community of use.

7.3. OCSP Profile

OCSP requests and responses shall be in accordance with RFC 6960.

7.3.1. Version Number

The version number for request and responses shall be v1.

7.3.2. OCSP Extensions

No stipulation.

8. Compliance Audit and Other Assessments

The BTC PAC shall be responsible for overseeing compliance of the emdha DSC CA, RAs, emdha DSC CA CP/CPS. BTC PAC shall ensure that the requirements of the emdha DSC CA CP/CPS and the provisions of applicable Agreements are implemented and enforced.

8.1. Frequency of Audit or Assessments

emdha DSC CA shall be subjected to periodic compliance audits which are no less frequent than once a year. emdha DSC CA shall also be performing internal audit at least on a quarterly basis against a randomly selected sample for monitoring adherence and service quality.

8.2. Identity and Qualifications of Assessor

The audit under Saudi National PKI shall be performed by a Qualified Auditor. A Qualified Auditor means a natural person, Legal Entity, or group of natural persons or Legal Entities that collectively possess the following qualifications and skills:

- Independence from the subject of the audit;
- The ability to conduct an audit that addresses the criteria specified in an Eligible Audit Scheme;
- Employs individuals who have proficiency in examining Public Key Infrastructure technology, information security tools and techniques, information technology and security auditing, and the third-party attestation function;

- Certified, accredited, licensed, or otherwise assessed as meeting the qualification requirements of auditors under the audit scheme; and
- Bound by law, government regulation, or professional code of ethics.

A licensed WebTrust auditor will be appointed to perform such compliance audits as a primary responsibility.

8.3. Assessor's Relationship to Assessed Entity

To provide an unbiased and independent evaluation, the auditor and audited party shall not have any current or planned financial, legal or other relationship that could result in a conflict of interest.

8.4. Topics Covered by Assessment

The compliance audits will verify whether the CA PKI operations environment is in compliance with the applicable CP/CPS and supporting operational policies and procedures. The term CA PKI Operations environment defines the total environment and includes:

- All documentation, records;
- Contracts/agreements;
- Compliance with applicable Law;
- Physical and logical controls;
- Personnel and approved roles/tasks;
- Hardware (e.g. servers, desktops, hardware security modules, network devices and security devices); and
- Software and information.

The auditor shall provide the BTC PAC and NCDC with a compliance report highlighting any discrepancies.

8.5. Actions Taken as A Result of Deficiency

If irregularities are found by the auditor, the audited party shall be informed in writing of the findings. The audited party must submit a report to the auditor or directly to NCDC or BTC PAC, as determined, as to any remedial action the audited party will take in response to the identified deficiencies. This report shall include a time for completion to be approved by the auditor or by NCDC in conjunction with emdha DSC CA, as appropriate.

Where an audited party fails to take remedial action in response to the identified deficiencies, NCDC shall be informed by the auditor and shall take the appropriate action, according to the severity of the deficiencies.

8.6. Communication of Results

An Audit Compliance Report, including identification of corrective measures taken or being taken by the audited party, shall be provided to the BTC PAC and/or NCDC as applicable.
emdha DSC CA shall make the Audit Report publicly available no later than three months after the end of the audit period. In the event of a delay greater than three months, an explanatory letter is to be signed by the Qualified Auditor.

9. Other Business and Legal Matters

9.1. Fees

9.1.1. Certificate Issuance/Renewal Fee

emdha DSC CA may charge fees for issuance/renewal of certificates, at the sole discretion of emdha DSC CA.

9.1.2. Certificate Access Fees

emdha DSC CA may charge access fee for providing access to its repository, for certain use-cases, at the sole discretion of emdha DSC CA.

9.1.3. Revocation or Status Information Access Fee

No fee will be charged by emdha DSC CA for revocation of a certificate. Further, no fee will be charged for a relying party to check the validity of the existing and valid certificate using a CRL.

No fees are charged by emdha DSC CA for providing certificate status information through OCSP.

9.1.4. Fees for Other Services

emdha DSC CA may charge additional fees for digital trust services depending on business needs.

9.1.5. Refund Policy

Refunds are not provided to subscribers, SIPs or RKAs.

9.2. Financial Responsibility

emdha DSC CA disclaims all liability implicit or explicit due to the use of any certificates issued by the emdha DSC CA which certify public keys of subscribers.

9.2.1. Insurance Coverage

Insurance coverage for any CA shall be in accordance with the applicable Agreement between the contracting party and the CA.

9.2.2. Other Assets

emdha DSC CA shall have sufficient financial resources to maintain their operations and perform their duties.

9.2.3. Insurance/warranty Coverage for End-Entities

emdha DSC CA disclaims all liability implicit or explicit due to the use of any certificates issued by the emdha DSC CA, which only certifies public keys of subscribers. It is the sole responsibility of subscribers and relying parties to ensure an adequate insurance, to cover risks using the certificate or rendering respective services.

9.3. Confidentiality of Business Information

Information pertaining to emdha DSC CA and not requiring protection may be made publicly available at the discretion of BTC PAC. Specific confidentiality requirements for business information are defined in Privacy Policy and applicable Agreements.

9.3.1. Scope of Confidential Information

Any corporate or personal information held by emdha DSC CA related to the application and issuance of Certificates is considered confidential and will not be released without the prior consent of the relevant holder, unless otherwise required by law or to fulfil the requirements of this CP/CPS, and in accordance with BTC PKI Privacy policy. BTC PKI Document Security Policy specifies which documents are considered to be confidential. Information contained in certificates and related certificate status is not confidential.

- Registration Information

All registration records, with an exception to information being provided in the certificate, are considered to be confidential information, including;

- Certificate applications, whether approved or not;
- Certificate information collected as part of the registration process;
- Completed Subscriber Agreements;
- Any information or supporting documentation requested and/or received by the emdha DSC CA pertaining to a certificate application.

- Certificate Information

The reasons for a certificate being suspended or revoked is considered confidential information, with the exception or CRL Extension - Reason Code, as specified in RFC 5280, and the revocation of the emdha DSC CA due to;

- The compromise of their private key, in which case a disclosure may be made that the private key has been compromised;
- The termination of the emdha DSC CA, in which case prior disclosure of the termination may be given.

- PKI Documentation

BTC PKI Document Security Policy specifies which documents are considered to be confidential.

9.3.2. Information not within the Scope of Confidential Information

Such information as specified by the BTC PAC, BTC PKI Privacy Policy, BTC PKI Document Security Policy, CA Operations Manual and applicable Agreements.

9.3.3. Responsibility to Protect Confidential Information

All PKI participants shall be responsible for protecting the confidential information they possess in accordance with BTC PKI Privacy Policy and applicable laws and Agreements.

9.4. Privacy of Personal Information

Any personal identifying information collected by emdha DSC CA shall be protected in accordance with BTC PKI Privacy Policy. It shall use reasonable measures to protect personal identifying information from disclosure to any third party.

9.4.1. Privacy Plan

Any confidential information collected by emdha DSC CA shall be protected in accordance with BTC PKI Privacy Policy.

9.4.2. Information Treated as Private

Any information that is not publicly available through the content of the issued certificate, repository and online CRL's is treated as private.

9.4.3. Information not Deemed Private

Information appearing in issued Certificates such as the name, organization affiliation and pubic key will not be deemed private.

9.4.4. Responsibility to Protect Private Information

Access to emdha DSC CA held private information shall be restricted to those with an official need-to-know basis in order to perform their official duties.

9.4.5. Notice and Consent to Use Private Information

Requirements for notice and consent to use private information are defined in the respective Agreements and BTC PKI Privacy Policy.

9.4.6. Disclosure Pursuant to Judicial/Administrative Process

Any disclosure shall be handled in accordance with BTC PKI Privacy Policy.

9.4.7. Other Information Disclosure Circumstances

Any disclosure shall be handled in accordance with BTC PKI Privacy Policy.

9.5. Intellectual Property Rights

BTC PAC retains exclusive rights to any product(s) or information developed under or pursuant to this CP/CPS.

9.6. Representations and Warranties

9.6.1. emdha DSC CA's Representations and Warranties

emdha DSC CA provides representations and warranties in accordance with this CP/CPS, respective agreements and applicable laws and regulations as below:

- Providing the operational infrastructure and certification services;
- Making reasonable efforts to ensure it conducts an efficient and trustworthy operation. "Reasonable efforts" include but are not limited to operating in compliance with:
  - Documented CP/CPS;
  - Documented CA Operations Manual; and
  - Within applicable agreements, Saudi Law and regulations.
- At the time of Certificate issuance; emdha DSC CA implemented procedure for verifying accuracy of the information contained within it before installation and first use;

- Maintaining 24 x 7 publicly-accessible repositories with current emdha DSC CA issued CA certificates and CRLs;
- For the CA's, the Hardware Security Modules (HSM's) used for key generation meet the requirements of FIPS 140-2 Level 3 to store the CA keys and take reasonable precautions to prevent any loss, disclosure, or unauthorized use of the CA private key(s)
- CA private key(s) are generated using multi-person control "m-of-n" split key knowledge scheme;
- Backing up of the CA signing Private Key(s) under the same multi-person control as the original Signing Key;
- Keep confidential, any passwords, PINs or other personal secrets used in obtaining authenticated access to PKI facilities and maintain proper control procedures for all such personal secrets;
- Use its private signing key only to sign certificates and CRLs and for no other purpose;
- Perform authentication and identification procedures in accordance with applicable Agreement and CA Operations Manual;
- Provide certificate and key management services in accordance with the CP and CPS; and
- Ensure that CA personnel use private keys issued for the purpose of conducting CA duties only for such purposes.

9.6.2. RA Representations and Warranties

No Stipulation.

9.6.3. Relying Parties Representations and Warranties

Relying Parties who rely upon the certificates issued under emdha DSC CA shall:

- Use the certificate for the purpose for which it was issued, as indicated in the certificate information (e.g., the key usage extension);
- Verify the Validity by ensuring that the Certificate was valid at the time of signing;
- Establish trust in the CA who issued a certificate by verifying the certificate path in accordance with the guidelines set by the X.509 Version 3 amendment;
- Ensure that the Certificate had not been suspended or revoked at the time of signing; and
- Determining that such Certificate provides adequate assurances for its intended use.

9.6.4. Subscriber Representations and Warranties

Subscribers are Individuals, entities, non-human subscribers (like Servers and Network Devices) to which certificates are issued, and are legally bound by a subscriber agreement or terms of use.

It is the responsibility of the Subscriber to:

1. Subscriber is obligated to:
   - Provide accurate and complete information at all times to the CA, RA or/and RKA;
   - Review and verify provided information for accuracy and completeness;
   - Generate key pair in FIPS 140-2 level 2 crypto device.
   - Secure authentication and consent mechanisms for certificate requests and take reasonable and necessary precautions to prevent loss, disclosure, modification, or unauthorized use of the private

key. This includes password, hardware token, Mobile Phone for OTP, or other activation data that is used to control access to the Subscriber's private key;
- Use Subscriber Certificate only for its intended use;
- Notify the CA in the event of any information in the Certificate is, or becomes, incorrect or inaccurate;
- Notify the CA in the event of a key compromise immediately whenever the Subscriber has reason to believe that the Subscriber's private key has been accessed by another individual, or compromised in any other manner;
- Use the Subscriber Certificate in a manner that does not violate applicable laws in the Kingdom of Saudi Arabia; and
- Upon termination of Subscriber Agreement, immediately notify the CA to cease use of the Subscriber Certificate.

2. Subscriber agrees that any use of the Subscriber Certificate to sign or otherwise approve the contents of any electronic record or message is attributable to Subscriber. Subscriber agrees to be legally bound by the contents of any such electronic record or message.

3. Subscriber shall indemnify and hold emdha DSC CA harmless from and against any and all damages (including legal fees), losses, lawsuits, claims or actions arising out of:
- Use of Subscriber's Certificate in a manner not authorized by the CA/SIP or otherwise inconsistent with the terms of the Subscriber Agreement or the emdha DSC CA CP/CPS;
- A Subscriber Certificate being tampered with by the Subscriber; or
- Inaccuracies or misrepresentations contained within the RKA records for the subscriber.
- A Subscriber shall indemnify and hold emdha DSC CA harmless against any damages and legal fees that arise out of lawsuits, claims or actions by third parties who rely on or otherwise use Subscriber's Certificate, where such lawsuit, claim, or action relates to a Subscriber's breach of its obligations outlined in this Subscriber Agreement or the emdha DSC CA CP/CPS, a Subscriber's failure to protect its authentication material or devices, or claims pertaining to content or other information or data supplied, or required to be supplied, by Subscriber.

9.7. Disclaimers of Warranties

emdha DSC CA hereby disclaims all warranties including warranty on merchantability and /or fitness to a particular purpose other than to the extent prohibited by law or otherwise expressly provided in emdha DSC CA CP/CPS.

emdha DSC CA, through its associated components, seeks to provide digital certification services according to international standards and best practices, using secure physical and electronic installations. emdha DSC CA provides no warranty, express, or implied, statutory or otherwise and disclaims any and all liability for the success or failure of the deployment of the emdha DSC CA or for the legal validity, acceptance or any other type of recognition of its own certificates, any digital signature backed by such certificates, and any products/solutions/services provided by emdha DSC CA. emdha DSC CA further disclaims any warranty of merchantability or fitness for a particular purpose of the above-mentioned certificates, digital signatures and products/solutions/services.

9.8. Limitations of Liability

emdha DSC CA disclaims liability to the certificate beneficiaries or any other third-parties for any loss suffered as a result of use or reliance on a certificate beyond those specified in emdha DSC CA CP/CPS, when such certificate has been issued and managed by emdha DSC CA in compliance with this CP/CPS. In any other case:

- emdha DSC CA will not incur any liability to Subscribers or any person to the extent that such liability results from their negligence, fraud or willful misconduct;
- emdha DSC CA assumes no liability whatsoever in relation to the use of Certificates or associated Public-Key/Private-Key pairs issued under this policy for any use other than in accordance with this policy. Subscribers will immediately indemnify emdha DSC CA from and against any such liability and costs and claims arising therefrom;
- emdha DSC CA will not be liable to any party whosoever for any damages suffered whether directly or indirectly as a result of an uncontrollable disruption of its services;
- End-Users are liable for any form of misrepresentation of information contained in the certificate to relying parties even though the information has been accepted by emdha DSC CA;
- Subscribers to compensate a Relying Party which incurs a loss as a result of the Subscriber's breach of Subscriber agreement;
- Relying Parties shall bear the consequences of their failure to perform the Relying Party obligations;
- RKAs shall bear the consequences of their failure to perform the obligations described in the RKA agreement; and
- emdha DSC CA denies any financial or any other kind of responsibility for damages or impairments resulting from its CA operation.

9.9. Indemnities

Notwithstanding any limitations on its liability to Subscribers and Relying Parties, emdha DSC CA understands and acknowledges that the Saudi National Root CA or Application Software Suppliers who have a Root Certificate distribution agreement in place with the Saudi National Root CA do not assume any obligation or potential liability of emdha DSC CA under these requirements or that otherwise might exist because of the issuance or maintenance of Certificates or reliance thereon by Relying Parties or others. Thus, emdha DSC CA shall defend, indemnify, and hold harmless each Application Software Supplier for any and all claims, damages, and losses suffered by such Application Software Supplier related to a Certificate issued by emdha DSC CA, regardless of the cause of action or legal theory involved. This does not apply, however, to any claim, damages, or loss suffered by such Application Software Supplier related to a Certificate issued by the emdha DSC CA where such claim, damage, or loss was directly caused by such Application Software Supplier's software displaying as not trustworthy a Certificate that is still valid, or displaying as trustworthy: (1) a Certificate that has expired, or (2) a Certificate that has been revoked (but only in cases where the revocation status is currently available from the CA online, and the application software either failed to check such status or ignored an indication of revoked status).

9.9.1. Indemnification by Subscribers

Any subscriber of emdha DSC CA or its subordinates, shall indemnify and hold harmless emdha DSC CA, its directors, its partners, its employees, any trusted root or intermediate entities and their respective directors, officers, employees, agents, and contractors from any and all damages and losses arising out of

- use of the Certificate in a manner not authorized by emdha DSC CA CP/CPS;
- tampering with the Certificate; or
- misrepresentation or omission of material fact in order to obtain or use a Certificate, whether or not such misrepresentation or omission was intentional.

In addition, Subscribers shall indemnify and hold harmless emdha DSC CA from any and all damages (including legal fees) for lawsuits, claims or actions by third-parties relying on or otherwise using the Certificate relating to:

- Subscriber's breach of their obligations under the Subscriber Agreement or emdha DSC CA CP/CPS; or
- Claims (including without limitation infringement claims) pertaining to content or other information or data supplied by subscriber to RKA.

9.9.2. Indemnification by Relying Parties

Any relying party of a certificate issued by emdha DSC CA, shall indemnify and hold harmless emdha DSC CA, its directors, its partners, any trusted root or intermediate entities and their respective directors, officers, employees, agents, and contractors from any and all damages and losses arising out of:

- breach of the Relying Party Agreement, emdha DSC CA CP/CPS, or applicable laws;
- unreasonable reliance on a Certificate;
- failure to check the Certificate's status prior to use;
- use of the Certificate in a manner not authorized by emdha DSC CA;
- tampering with the Certificate; or
- misrepresentation or omission of material fact in order to obtain or use a Certificate, whether or not such misrepresentation or omission was intentional.

9.10. Term and Termination

9.10.1. Term

This CP/CPS shall be effective upon approval by BTC PAC in liaison with approval by NCDC. Once the CP/CPS becomes effective, it is published in the repository. Amendments to this CP/CPS upon approval become effective and replace the older version in the repository.

9.10.2. Termination

This CP/CPS as amended from time to time shall remain in force until it is replaced by a new version. The latest version of the emdha DSC CA CP/CPS can be found at: https://www.emdha.sa

9.10.3. Effect of Termination and Survival

Upon termination of this CP/CPS, all emdha DSC CA participants are nevertheless bound by its terms for all certificates issued for the remainder of the validity periods of such certificates.

9.11. Individual Notices and Communications with Participants

All communication between NCDC, BTC PAC, Saudi National Root-CA, emdha DSC CA, RKAs and Subscribers shall be in writing. The communication shall be signed and stamped on the appropriate organization letterhead, where applicable.

9.12. Amendments

9.12.1. Procedure for Amendment

The BTC PAC shall review this CP/CPS at least once per year. Errors, updates, or suggested changes to this CP/CPS shall be communicated to the BTC PAC. Such communication shall include a description of the change, a change justification, and contact information for the person requesting the change. Any technical changes in the emdha DSC CA shall be managed as per the BTC PKI Change Management Policy. Subject to the approval of NCDC, the BTC PAC reserves the right to change this CP/CPS from time to time. The BTC PAC will incorporate any such change into a new version of this CP/CPS and, upon approval, publish the new version. The new CP/CPS will carry a new version number.

9.12.2. Notification Mechanism and Period

This CP/CPS and any subsequent changes shall be made available to the emdha DSC CA participants at: https://www.emdha.sa within two weeks of approval. The BTC PAC reserves the right to amend this CP/CPS without notification for amendments that are not material, including without limitation corrections of typographical errors, changes to URL's, and changes to contact information. All the PKI participants and other parties designated by the BTC PAC shall provide their comments to the BTC PAC in accordance with section 9.11 of this document. The BTC PAC's decision to designate amendments as material or non-material shall be at the PAC's sole discretion.

9.12.3. Circumstances under which OID must be changed

The policy OID shall only change if the change in the CP/CPS results in a material change to the trust by the relying parties, as determined by the BTC PAC and shall only change pursuant to approval from NCDC.

9.13. Dispute Resolution Procedures

The use of certificates issued by the emdha DSC CA is governed by contracts, agreements, and standards set forth by emdha DSC CA. Those contracts, agreements and standards include dispute resolution policy and procedures that shall be employed in any dispute arising from the issuance or use of a certificate governed by this CP/CPS. Dispute Resolution mechanism is described in BTC PKI Complaint and Dispute Resolution Policy.

9.14. Governing Law

This CP/CPS is governed by the laws of the Kingdom of Saudi Arabia.

9.15. Compliance with Applicable Law

This CP/CPS is subject to applicable national, local and foreign laws, rules, regulations, ordinances, decrees, and orders including, but not limited to, restrictions on exporting or importing software, hardware, or technical information.

9.16. Miscellaneous Provisions

9.16.1. Entire Agreement

In the event that any one or more of the provisions contained in this CP/CPS shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision of this CP/CPS, which shall be construed as of such invalid, illegal or

unenforceable provision had never been set forth herein, and the CP/CPS shall be enforced as nearly as possible according to its original terms and intent.

9.16.2. Assignment

Except where specified by other contracts, no party may assign or delegate this CP/CPS or any of its rights or duties under this CP/CPS, without the prior written consent of the BTC PAC.

9.16.3. Severability

Should it be determined that one section of this CP/CPS is incorrect or invalid, the other sections of this CP/CPS shall remain in effect until the CP/CPS is updated. The process for updating this CP/CPS is described in section 9.12.

9.16.4. Enforcement (Attorney Fees/Waiver of Rights)

This document shall be treated according to laws of Kingdom of Saudi Arabia. Legal disputes arising from the operation of the emdha DSC CA will be treated according to laws of Kingdom of Saudi Arabia.

9.16.5. Force Majeure

emdha DSC CA shall not be liable for any failure or delay in its performance under this CP/CPS due to causes that are beyond its reasonable control, including, but not limited to, an act of God, act of civil or military authority, fire, epidemic, flood, earthquake, riot, war, failure of equipment, failure of telecommunications lines, lack of Internet access, sabotage, and reasons beyond provisions of the governing law.

9.17. Other Provisions

9.17.1. Fiduciary Relationships

Nothing contained in this CP/CPS shall be deemed to constitute either the emdha DSC CA, or any of its subcontractors, agents, officers, suppliers, employees, partners, principals, or directors to be a partner, Affiliate, trustee, of any Relying Party or any third party, or to create any fiduciary relationship between the emdha DSC CA and any Relying party, or any third party, for any purpose whatsoever.

Nothing in this CP/CPS or any Agreement between a third party and a Relying Party shall confer on any Subscriber, Customer, Relying Party, Registration Authority, Applicant or any third party, any authority to act for, bind, or create or assume any obligation or responsibility, or make any representation on behalf of the emdha DSC CA.

9.17.2. Administrative Processes

No Stipulation

Appendix- A: Type of Certificates

This section details different certificate types issued under the emdha DSC CA and their respective policies and certificate profiles.

For issuance of a particular certificate type, RA shall submit request to emdha DSC CA. Based on emdha DSC CA approval and NCDC Approval, RA(s) are authorized to issue particular certificate type. It is mandatory to comply with all requirements applicable to the respective certificate type, as well as, any additional restrictions or conditions communicated to the RA by emdha DSC CA.

Refer to table "Certificate Types" in Section 1.2 for the type of certificates issued by emdha DSC CA, with detailed information in subsequent sections.

1. DSC Individual Certificate (Natural Person)

DSC Individual Certificates (Natural Person) are subscriber certificates which will be issued as per the process defined in CA Operations Manual. They shall have the following certificate extensions, in accordance with section 7 of this CP/CPS:

1.1. Extension Definitions for DSC Individual Certificate (Natural Person)

Field / fx.509 extension	Value or Value Constant	Critical
Subject	Common Name (CN) = (Full Name in English and/or Arabic) Telephone Number (T) = (SHA256 Hashed Mobile Number) [Optional] Serial Number = (SHA256 Hashed(National ID / Iqama ID)) Unique Identifier = (SHA256 Hashed (emdha UAV Unique Reference Number of Subject)) [OPTIONAL] Locality Name (L) = (Locality or Area) State or Province Name (ST) = (State or Province or Emirates) Country Name (C) = (Country)	V1 Field
Serial Number	Unique serial number with minimum 64-bit entropy	V1 Field
Subject Alternate Name	RFC822 Name = <verified end-user email address> [Optional]	NO
CRL Distribution Points	[1] CRL Distribution Point Distribution Point Name: Full Name: URL=http://repository.emdha.sa/crls/dscca.crl	NO
Authority Key Identifier	<Same as the SubjectKeyIdentifier of the emdha DSC CA>	NO
Subject Key Identifier	keyIdentifier encoded in compliance to RFC 5280	NO

Field / fx.509 extension	Value or Value Constant	Critical
	The keyIdentifier should be composed of the 160-bit SHA-1 hash of the value of the BIT STRING subjectPublicKey of the subscriber public key (excluding the tag, length, and number of unused bits).	
Basic Constraints	Subject Type=End Entity Path Length Constraint=None	YES
Authority Information Access	[1]Authority Info Access Access Method=On-line Certificate Status Protocol (1.3.6.1.5.5.7.48.1) Alternative Name: URL=http://ocsp.emdha.sa [2]Authority Info Access Access Method=Certification Authority Issuer (1.3.6.1.5.5.7.48.2) Alternative Name: URL=http://repository.emdha.sa/cacerts/dscca.crt	NO
Certificate Policies	[1]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3.1 [1,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text=DSC Individual Certificate (Natural Person) [2]Certificate Policy: Policy Identifier={OID of the Assurance Level as per Appendix B} [2,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text={Description of the Assurance Level as per table "Assurance Levels" in Section 1.2 of the emdha DSC CA CP/CPS} [3]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3 [3,1]Policy Qualifier Info: Policy Qualifier ID=CPS Qualifier: http://www.emdha.sa [3,2]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text= emdha DSC CA Certification Policy and associated documentation available at https://www.emdha.sa/ is hereby incorporated into your use or reliance on this Certificate.	NO
Key Usage	Digital Signature, Non-Repudiation	YES

Field / fx.509 extension	Value or Value Constant	Critical
Extended Key Usage	Purpose#1=Document Signing (Microsoft) (1.3.6.1.4.1.311.10.3.12) Purpose#2= Acrobat Authentic Document Trust (Adobe) (1.2.840.113583.1.1.5)	NO

2. DSC Organization Certificate (Legal Entity)

DSC Organization Certificate (Legal Entity) are subscriber certificates which will be issued as per the process defined in CA Operations Manual. They shall have the following certificate extensions, in accordance with section 7 of this CP/CPS:

2.1. Extension Definitions for DSC Organization Certificate (Legal Entity)

Field / fx.509 extension	Value or Value Constant	Critical
Subject	Common Name (CN) = (Doing Business As (DBA) Name in English and/or Arabic) Organizational Unit (OU) = (Organization / Entity Unit) [Optional] Organization Name (O) = (Organization / Entity Name) Organization Identifier = (Organization / Entity Registration Number) Unique Identifier = (SHA256 Hashed (emdha UAV Unique Reference Number of Subject)) [Optional] Telephone Number (T) = (SHA256 Hashed Organization / Entity Telephone Number) [Optional] Locality Name (L) = (Locality or Area) [Optional] State or Province Name (ST) = (State or Province or Emirates) [Optional] Country Name (C) = (Country)	V1 Field
Serial Number	Unique serial number with minimum 64-bit entropy	V1 Field
Subject Alternate Name	RFC822 Name = <verified end-user email address> [Optional]	NO
CRL Distribution Points	[1] CRL Distribution Point Distribution Point Name: Full Name: URL=http://repository.emdha.sa/crls/dscca.crl	NO
Authority Key Identifier	<Same as the SubjectKeyIdentifier of the emdha DSC CA>	NO
Subject Key Identifier	keyIdentifier encoded in compliance to RFC 5280 The keyIdentifier should be composed of the 160-bit SHA-1 hash of the value of the BIT STRING subjectPublicKey of the subscriber public key (excluding the tag, length, and number of unused bits).	NO
Basic Constraints	Subject Type=End Entity Path Length Constraint=None	YES
Authority Information Access	[1]Authority Info Access Access Method=On-line Certificate Status Protocol (1.3.6.1.5.5.7.48.1) Alternative Name: URL=http://ocsp.emdha.sa [2]Authority Info Access	NO

Field / fx.509 extension	Value or Value Constant	Critical
	Access Method=Certification Authority Issuer (1.3.6.1.5.5.7.48.2) Alternative Name: URL=http://repository.emdha.sa/cacerts/dscca.crt	
Certificate Policies	[1]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3.2 [1,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text= DSC Organization Certificate (Legal Entity) [2]Certificate Policy: Policy Identifier={OID of the Assurance Level as per Appendix B} [2,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text={Description of the Assurance Level as per table "Assurance Levels" in Section 1.2 of the emdha DSC CA CP/CPS} [3]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3 [3,1]Policy Qualifier Info: Policy Qualifier ID=CPS Qualifier: http://www.emdha.sa [3,2]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text= emdha DSC CA Certification Policy and associated documentation available at https://www.emdha.sa/ is hereby incorporated into your use or reliance on this Certificate.	NO
Key Usage	Digital Signature, Non-Repudiation	YES
Extended Key Usage	Purpose#1=Document Signing (Microsoft) (1.3.6.1.4.1.311.10.3.12) Purpose#2= Acrobat Authentic Document Trust (Adobe) (1.2.840.113583.1.1.5)	NO

3. DSC Cloud-based Digital Seal Certificate (Legal Entity)

DSC Cloud-based Digital Seal Certificate (Legal Entity) are subscriber certificates which will be issued as per the process defined in CA Operations Manual. They shall have the following certificate extensions, in accordance with section 7 of this CP/CPS:

3.1. Extension Definitions for DSC Cloud-based Digital Seal Certificate (Legal Entity)

Field / fx.509 extension	Value or Value Constant	Critical
Subject	Common Name (CN) = (Doing Business As (DBA) Name in English and/or Arabic) Organizational Unit (OU) = (Organization / Entity Unit) [Optional] Organization Name (O) = (Organization / Entity Name) Organization Identifier = (Organization / Entity Registration Number) Telephone Number (T) = Organization / Entity Telephone Number [Optional] Locality Name (L) = (Locality or Area) [Optional] State or Province Name (ST) = (State or Province or Emirates) [Optional] Country Name © = SA	V1 Field
Serial Number	Unique serial number with minimum 64-bit entropy	V1 Field
Subject Alternate Name	RFC822 Name = <verified end-user email address> [Optional]	NO
CRL Distribution Points	[1] CRL Distribution Point Distribution Point Name: Full Name: URL=http://repository.emdha.sa/crls/dscca.crl	NO
Authority Key Identifier	<Same as the SubjectKeyIdentifier of the emdha DSC CA>	NO
Subject Key Identifier	keyIdentifier encoded in compliance to RFC 5280 The keyIdentifier should be composed of the 160-bit SHA-1 hash of the value of the BIT STRING subjectPublicKey of the subscriber public key (excluding the tag, length, and number of unused bits).	NO
Basic Constraints	Subject Type=End Entity Path Length Constraint=None	YES
Authority Information Access	[1]Authority Info Access Access Method=On-line Certificate Status Protocol (1.3.6.1.5.5.7.48.1) Alternative Name: URL=http://ocsp.emdha.sa [2]Authority Info Access Access Method=Certification Authority Issuer (1.3.6.1.5.5.7.48.2) Alternative Name: URL=http://repository.emdha.sa/cacerts/dscca.crt	NO

Field / fx.509 extension	Value or Value Constant	Critical
Certificate Policies	[1]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3.4 [1,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text= DSC Cloud-based Digital Seal Certificate (Legal Entity) [2]Certificate Policy: Policy Identifier={OID of the Assurance Level as per Appendix B} [2,1]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text={Description of the Assurance Level as per table "Assurance Levels" in Section 1.2} [3]Certificate Policy: Policy Identifier=2.16.682.1.101.5000.1.4.1.1.3 [3,1]Policy Qualifier Info: Policy Qualifier ID=CPS Qualifier: http://www.emdha.sa [3,2]Policy Qualifier Info: Policy Qualifier ID=User Notice Qualifier: Notice Text= emdha DSC CA Certification Policy and associated documentation available at https://www.emdha.sa/ is hereby incorporated into your use or reliance on this Certificate.	NO
Key Usage	Digital Signature, Non-Repudiation	YES
Extended Key Usage	Purpose#1=Document Signing (Microsoft) (1.3.6.1.4.1.311.10.3.12) Purpose#2= Acrobat Authentic Document Trust (Adobe) (1.2.840.113583.1.1.5)	NO

Appendix- B: Assurance levels and related policies

1. Policy for Low Assurance Level

Sr.	Description	Policy for Low Assurance Level
1	**Assurance Level**	Low
2	**Assurance policy OID**	2.16.682.1.101.5000.1.4.1.1.2.101
3	**Description and Appropriate Usage**	LOW Assurance Cert. Suitable for handling information of low value within minimally secured environments. Relying parties risk minimal consequences due to fraudulent identity registration.
4	**Key Usage**	Digital Signature
5	**Key Generation**	By Subscriber in a soft token.
6	**Registration (Identity-Proofing) requirements**	For Registration of Individual, please refer section 3 “Registration of Individual Person” in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa For Registration of Organization, please refer section 4 “Registration of Organization” in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa
7	**Requirement for each key activation and/or certificate generation**	A) User Consent, B) 2-factor authentication by registered user

Notes

1. The complete “Description and Appropriate Usage” clause is “This level provides little confidence in the accuracy or legitimacy of the claimed identity as it requires no or low assurance of the binding between the identity of the entity named in the certificate and the Subscriber. It is intended for Subscribers handling information of little or no value within minimally secured environments. Identity assertions at this level are appropriate for transactions with minimal consequences to Relying Parties from the registration of a fraudulent identity”. Due to space restrictions in the certificate, it has been abbreviated to the clause as mentioned in the table above.

2. This “Description and Appropriate Usage” clause is a disclaimer to anyone who relies on the certificate and therefore the signer. emdha takes due care and due diligence during the subscriber registration process, with strong focus on “Identity Proofing”, “Credential Strength” and “Credential Management”, as detailed in the IVG to significantly reduce the possibility of fraudulent registration. However, it is at the complete discretion of the relying party to accept the certificate and the associated assurance level.

2. Policy for Medium Assurance Level

Sr.	Description	Policy for Medium Assurance Level
1	**Assurance Level**	Medium
2	**Assurance policy OID**	2.16.682.1.101.5000.1.4.1.1.3.102
3	**Description and Appropriate Usage**	MEDIUM Assurance Cert. Suitable for handling information of medium value within substantially secured environments. Relying parties risk serious consequences due to fraudulent identity registration.
4	**Key Usage**	Digital Signature and/or Non-Repudiation
5	**Key Generation**	By Subscriber in at least FIPS 140-1-L2+ compliant crypto devices.
6	**Registration (Identity-Proofing) requirements**	For Registration of Individual, please refer section 3 "Registration of Individual Person" in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa For Registration of Organization, please refer section 4 "Registration of Organization" in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa
7	**Requirement for each key activation and/or certificate generation**	A) User Consent, B) 2-factor authentication by registered user

Notes

1. The complete "Description and Appropriate Usage" clause is "This level provides medium confidence in the accuracy or legitimacy of the claimed identity. It is intended for Subscribers handling information of medium value within substantially secured environments. Identity assertions at this level are appropriate for transactions with serious (substantial) consequences to Relying Parties from the registration of a fraudulent identity". Due to space restrictions in the certificate, it has been abbreviated to the clause as mentioned in the table above.

2. This "Description and Appropriate Usage" clause is a disclaimer to anyone who relies on the certificate and therefore the signer. emdha takes due care and due diligence during the subscriber registration process, with strong focus on "Identity Proofing", "Credential Strength" and "Credential Management", as detailed in the IVG to significantly reduce the possibility of fraudulent registration. However, it is at the complete discretion of the relying party to accept the certificate and the associated assurance level.

3. Policy for High Assurance Level

Sr.	Description	Policy for High Assurance Level
1	**Assurance Level**	High
2	**Assurance policy OID**	2.16.682.1.101.5000.1.4.1.1.3.103
3	**Description and Appropriate Usage**	HIGH Assurance Cert. Suitable for handling information of high value within highly secured environments. Relying parties risk catastrophic consequences due to fraudulent identity registration.
4	**Key Usage**	Digital Signature and/or Non-Repudiation
5	**Key Generation**	By Subscriber in at least FIPS 140-1-L2+ compliant crypto devices.
6	**Registration (Identity-Proofing) requirements**	For Registration of Individual, please refer section 3 "Registration of Individual Person" in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa For Registration of Organization, please refer section 4 "Registration of Organization" in emdha Identity Verification Guidelines (IVG) available at https://www.emdha.sa
7	**Requirement for each key activation and/or certificate generation**	A) User Consent, B) 2-factor authentication including a biometric factor by registered user

Notes

1. The complete "Description and Appropriate Usage" clause is "This level provides a high confidence in the accuracy or legitimacy of the claimed identity. It is intended for Subscribers handling information of high value within highly secured environments. Identity assertions at this level are appropriate for transactions with catastrophic consequences to Relying Parties from the registration of a fraudulent identity". Due to space restrictions in the certificate, it has been abbreviated to the clause as mentioned in the table above.

2. This "Description and Appropriate Usage" clause is a disclaimer to anyone who relies on the certificate and therefore the signer. emdha takes due care and due diligence during the subscriber registration process, with strong focus on "Identity Proofing", "Credential Strength" and "Credential Management", as detailed in the IVG to significantly reduce the possibility of fraudulent registration. However, it is at the complete discretion of the relying party to accept the certificate and the associated assurance level.