密钥加载演练流程  
**Key Loading Practice Process**

**文 件 编 号: KD-MY01-002**

**Doc. No.:**

**编 制:安全策略部**

**Prepared by:** **Security Policy Department**

**审 核:**

**Reviewed by:**

**批 准:**

**Approved by:**

**版本 /修订状态: A9**

**Rev./Revision status:**

**受 控 状 态:**

**Controlled status:**

**2020-1-1发布 2020-1-1实施**  
**Issued on 1 / 1 /2020** **Implemented on 1 / 1 /2020**

**修改记录**Document Changes

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **修改条款** **Modified terms** | **修订状态** **Revision Status** | **修改内容** **Description** | **修改日期** **Date** | **修改人** **Changed by** | **审核人** **Reviewed by** | **批准人** **Approved By** |
| / | A/0 | 初次发行 Initial release | 2015/09/22 | 韩德均 Han Dejun | 刘劲松 Liu Jinsong | 罗长兵 Luo Changbing |
| 4.1 | A/1 | 更新密钥管理组织架构图 Update the diagram of key management organization | 2016/03/11 | 曹良攀 Cao Liangpan | 刘劲松 Liu Jinsong | 罗长兵 Luo Changbing |
| 4.1 | A/2 | 更新密钥管理组织架构图 Update the diagram of key management organization | 2016/8/29 | 徐锐 Xu Rui | 刘劲松 Liu Jinsong | 罗长兵 Luo Changbing |
| 3.4, 5.7 | A/3 | 1. 格式调整 Format adjustment 2. Logo修改 Logo modification 3. 审批人修改 Modified by the approver | 2017/2/27 | 徐锐 Xu Rui | 刘劲松 Liu Jinsong | 罗长兵 Luo Changbing |
| 4.1 | A/4 | 更新密钥管理组织架构图 Update the diagram of key management organization | 2017/5/19 | 徐锐 Xu Rui | 刘劲松 Liu Jinsong | 罗长兵 Luo Changbing |
| 4.1 | A/5 | 更新密钥管理组织架构图 Update the diagram of key management organization | 2017/9/29 | 王建勋 Wang Jianxun | 王建勋 Wang Jianxun | 刘劲松 Liu Jinsong |
| / | A/6 | 更换log及公司名称 Change log and company name | 2018/7/25 | 黄伟 Huang Wei | 王建勋 Wang Jianxun | 刘劲松 Liu Jinsong |
| 4.1 | A/7 | 更新密钥管理组织架构图 Update the diagram of key management organization | 2018/12/10 | 黄伟 Huang Wei | 王建勋 Wang Jianxun | 刘劲松 Liu Jinsong |
| 5.6 | A/8 | 添加：密钥加载验证 Add: key loading verification | 2019/1/15 | 黄伟 Huang Wei | 王建勋 Wang Jianxun | 刘劲松 Liu Jinsong |
| All | A/9 | 修改与实际情况不相符的规则 | 2019/12/28 | 黄伟 Huang Wei | 王建勋 Wang Jianxun | 刘劲松 Liu Jinsong |

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# 1目的 Purpose

此流程用于规范密钥加载操作过程，通过加载演练熟悉并完善整个流程，四川科道芯国智能技术股份有限生产中心智能卡及数据生产中心（以下简称为生产中心）依据GB/T19001-2008《质量管理体系要求》，生产中心结合生产中心生产经营特点，形成生产中心的《密钥加载演练流程》。

This process is used to regulate the key loading process, and to be familiar with and perfect it through loading practice.The intelligent card and data production center (hereinafter referred to as the "production center") of KEYDOM prepares its own *Key Loading Practice Process* based on its production and operation features according to the GB/T19001-2008 *Quality Management System Requirements*.

# 2适用范围 Scope of Application

此流程用于密钥加载操作过程。

This process is applicable to the key loading process.

# 3定义 3 Definition

## 3.1对称密钥 Symmetrical Key

对称密钥加密又叫专用密钥加密，即发送和接收数据的双方必使用相同的密钥对明文进行加密和解密运算。对称密钥加密算法主要包括：DES、3DES、IDEA、 FEAL、BLOWFISH等。

Symmetrical key encryption is also called dedicated key encryption, i.e. the data sender and the data receiver must use the same key to realize encryption and decryption operations to cleartext. The encryption algorithm of symmetrical key mainly includes DES, 3DES, IDEA, FEAL, and BLOWFISH, etc.

## 3.2非对称密钥 Unsymmetrical Key

非对称加密算法需要两个密钥：公开密钥（publickey）和私有密钥（privatekey）。公开密钥与私有密钥是一对，如果用公开密钥对数据进行加密，只有用对应的私有密钥才能解密；如果用私有密钥对数据进行加密，那么只有用对应的公开密钥才能解密。因为加密和解密使用的是两个不同的密钥，所以这种算法叫作非对称加密算法。

The unsymmetrical encryption algorithm requires two keys, i.e. public key and private key. The public key and the private key are a pair, if public key is used to encrypt data, only the corresponding private key can decrypt the data; if private key is used to encrypt data, only the corresponding private key can decrypt the data. Encryption and decryption use two different keys, so the algorithm is called unsymmetrical encryption algorithm.

## 3.3 HSM

硬件加密机。

Hardware encryption equipment.

## 3.4 保险箱 Safe Box

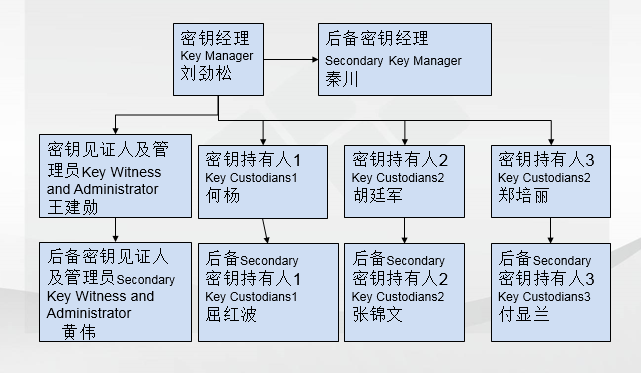
保险箱用于密钥组件的暂存管理。

Safe box is used for temporary storage management of key components.

# 4职能职责 4 Duties and Responsibilities

## 4.1密钥管理组织架构 Key Management Organization

**密钥管理组织架构图**  
**Diagram of Key Management Organization**



只有通过授权允许的人员才有权来完成相关的工作任务，且只能授权给必须知道和使用的人员，相关操作不允许用于工作之外的任何地方。

Only people who know and use the key can be authorized to complete relevant works, and relevant operations cannot be used for other purposes except the work.

在密钥持有人因特殊情况不在时，他（她）必须负责将相关资料与操作流程指派给相应的后备人员；后备人员必须清楚自己的职责，后备人员除必须知道的工作任务外不能知道任何有关重要资料的内容。

If the key holder is absent for special reasons, he (she) must dispatch relevant data and operation process to the backup personnel who must be aware of their own duties but cannot know other important information except their own work tasks.

## 4.2 密钥管理组织各岗位的职能职责 Duties and Responsibilities of Each Key Management Organization Post

### 4.2.1密钥经理 Key Manager

* 负责从事密钥活动中整个过程的监督、组织、审查，确保整个过程中所有操作均按照管理制度进行。  
  The key manager is responsible for supervision, organization and review of the whole key activity process to make sure all operations comply with the management system.
* 确保所有相关操作均已记录在案。  
  Make sure all relevant operations are recorded.
* 确保严格按照文件程序实施密钥管理活动。  
  Make sure key management activities are comply with document procedures strictly.
* 负责与人力资源管理部沟通，每年审查全部密钥管理人员是否符合担任该岗位的要求。  
  Communicate with the human resource management department, and review whether all key management personnel can meet requirements for the post every year.
* 密钥经理必须对密钥管理人员进行严格的安全培训，每年度至少一次。  
  The key manager must provide strict safety training to key management personnel at least once a year.

### 4.2.2密钥持有人 Key Holder

* 确保密钥的保密性和完整性，其他人不得接触或了解任何密钥内容。  
  Ensure confidentiality and integrity of the key, and others cannot touch or know any key content.
* 密钥持有人及其后备必须由密钥经理正式指派，记录在《密钥持有人授权书》中。  
  Key holder and backup personnel must be officially dispatched by the key manager, and recorded in the *Certificate of Authorization for Key Holder.*
* 各个密钥持有人员禁止密钥业务交叉，防止密钥的外泄。  
  Key holders shall prevent key business cross and disclosure of the key.

### 4.2.3密钥见证人员 Key Witness

* 负责监督整个密钥的过程是否符合标准并填写对应的记录表单。  
  The key witness shall be responsible for supervising the whole key process to check whether it reach the standard, and filling in the corresponding record.

### 4.2.4密钥管理员 Key Administrator

* 确保密钥加载涉及到的相关软硬件工作正常，负责密钥的管理。  
  The key administrator shall make sure the software and hardware involved in key loading are running normally, and be responsible for key management.

# 5密钥加载 Key Loading

## 5.1密钥类型 Key Type

根据需求,下面所示密钥管理系统的密钥,必须遵守以下标准:  
According to the requirements, keys of following key management system must comply with the standards listed below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Key Types** | **Key Names** | **Key Length (bit)** | **Key Lifespan** |
| T-DES | KEK/Application Key/Card Key | 128 | 29 Aug 20XX |

## 5.2密钥加载前 Before Key Loading

(1)检查密钥管理系统、HSM是否处于正常的状态，HSM时间、日期是否与电脑和密钥管理系统同步，填写《HSM、密钥管理系统检查表》。。

(1) Check whether key management system and HSM are normal, check whether HSM time and date are synchronous with the computer and key management system, and fill in the *Sheet for Inspection of HSM and Key Management System*.

（2）在使用任何系统之前，确保已经变更软硬件的默认安全设置。

(2) Make sure the default safety settings of software and hardware have been changed before using any system.

## 5.3密钥加载的构成 Constitution of Key Loading

（1）密钥管理员准备密钥加载环境，即密钥系统和要使用的硬件设施。

(1) Key administrator prepares the key loading environment, i.e. the key system and hardware facilities to be used.

（2）密钥经理通知密钥持有人、密钥见证人、密钥管理员举行密钥加载的时间。

(2) Key manager informs key loading time to the key holder, the key witness and the key administrator.

## 5.4密钥加载的准备 Preparations for Key Loading

（1）在密钥加载开始之前必须先到安全策略部领取保险柜钥匙。

(1) You must get the safe box key from safety policy department before key loading.

（2）在进行密钥加载之前密钥持有人从指定的保险柜中取出密钥材料，确保密钥信封保持密封。

(2) Key holder obtains key data from the designated safe box and make sure the key envelope is still sealed before key loading.

（3）当接触到密钥时应首先检查密钥信封，确保密钥信封密封性，检查信封上的签名和日期必须与记录表中的信息一致，确认没被打开和发生篡改行为，如果无法保证材料的保密性,必须立即通知密钥经理。

(3) Before touching the key, please check the key envelope at first to make sure the confidentiality, check whether signature and date on the envelope are consistent with information in the record sheet, and make sure it has not been open or tampered. If the confidentiality of the material cannot be guaranteed, please notify the key manager immediately.

（4）密钥管理员检查密钥加载环境工作状态,确保密钥加载的正常进行，确认没有任何未授权的更改迹象。

(4) The key administrator must check operating status of the key loading environment, make sure key loading is normal, and guarantee there is no sign of unauthorized change.

（5）密钥见证人员确保进行密钥加载时的环境一切正常(例如,只有指定进行密钥加载的相关人员在场)。

(5) The key witness shall make sure key the loading environment is normal (for example, only designated key loading personnel are on site).

（6）以上的所有检查通过后,则可以开始进行密钥加载活动。

(6) Key loading activity can be started when all above inspections are passed.

## 5.5执行密钥生成 Implementation of Key Generation

（1）密钥组件只能在HSM内生成。  
(1) Key components can only be generated in HSM.

（2）在密钥生成阶段，必须完全确保双控和明确的职责分离。  
(2) Dual-control and clear division of duties must be ensured in key generation stage.

（3）产生出来的明文密钥组件必须由对应的密钥持有人立刻密封在封内。  
(3) The generated cleartext key components must be sealed in an envelope by the corresponding key holder.

（4）密封信封时，密钥持有人必须在开口重叠部分签名，并写上签名日期。  
(4) When sealing the envelope, the key holder must sign on overlapped part of the opening, and write date of the signature.

（5）密钥持有人必须使用透明胶带将信封的任何缝隙封死，以确保密钥没有被篡改的可能。  
(5) The key holder must use transparent tape to seal all gaps of the envelope to make sure the key cannot be tampered.

## 5.6执行密钥加载 Implementation of Key Loading

（1）密钥持有人分别与密钥经理、密钥见证人、密钥管理员进入生产机房，从保险箱中取出密钥组件检查完整无误的情况下，密钥持有人填写《保险箱存取记录表》。  
(1) The key holder enters production room together with the key manager, key witness and key administrator respectively, take key components from the safe box and make sure they are correct and complete, and then fills in the Safe Box Access Record.

（2）密钥持有人将密钥输入到密钥管理系统,确保任何人都无法看到密钥的输入后并填写《密钥加载记录表》。  
(2) The key holder inputs the key to key management system, and fills in the *Key Loading Record* after making sure that no people can see the input process.

（3）密钥输入的环境必须全程有监控,二十四小时全程摄影。  
(3) The key input environment must be monitored and shot in 24 hours.

（4）密钥加载完成最后的密钥持有人，必须同密钥经理在双人四目的情况下通过密钥效验值验证加载密钥是否成功。  
(4) At the end of key loading, the key holder must verify the key proof test value to see whether key loading is successful under the witness of the key manager.

（5）所有的密钥仪式应在三十分钟内完成。  
(5) All key ceremonies shall be completed in thirty minutes.

## 5.7存放密钥到保险箱 Storage of Key in Safe Box

（1）密钥持有人分别与密钥管理员、密钥经理、密钥见证人进入机房通过密钥管理员与密钥持有人双控打开密钥保险箱将密钥存入，密钥持有人填写《保险箱存取记录表》。  
(1) The key holder enters room with the key administrator, key manager and key witness respectively to store the key in safe box after key administrator and key holder open the safe box, and then fills in the *Safe Box Access Record*.

（2）全程必需采双人控制,密钥管理员、密钥经理见证并签字。  
(2) The whole process must be controlled by two people, a key administrator and a key manager, to witness and sign it.

## 5.8密钥经理的准备工作 Preparations by the Key Manager

（1）重要的密钥必须存储到密钥的管理系统中，密钥经理必须持有这些资料所在位置的详细清单。  
(1) Important keys must be stored in the key management system, and the key manager must keep a detailed list on positions of these data.

（2）密钥经理必须能够识别这些资料并分配任务（如：KEY的生命周期）。  
(2) The key manager must be able to identify these data and assign tasks (such as the KEY service life).

（3）备有证明文件的传送（是被使用过的）（登录日志或数据库）重要的资料传送只能有一位收件人能够预先详细的知道。  
(3) Transfer of important (used) documents (login log or database), and important data only have one recipient who can know details in advance.

（4）在传送期间，使用预先确定的加密编码及可识别的传送密钥；并填写机密信息的传送及相关密钥的传送记录表格（如：输入表格或传送表格）。  
(4) During document transfer, please use the pre-determined encryption code and identifiable transfer key; fill in record sheet for the transfer of confidential information and relevant keys (such as input sheet or transfer sheet).

（5）重要的资料只能单独的使用并需预先指定（如：传输密钥,密钥的生命周期）。  
(5) Important data can only be used separately and designated in advance (such as the transfer key and service life of the key).

# 6机密资料、密钥的命名 Naming of Confidential Data and Key

命名规则都遵循：公司标识-文件类型的拼音首写-编码-日期  
Naming rules to be followed: company logo - Pingyin acronym of document type - code - date

如: 密钥分量:JK-MYFL-公司名称-001-20150822  
For example: key components: JK-MYFL- company name -001-20150822

密钥：JK-MY-公司名称-001-20150822  
Key: JK-MY- company name -001-20150822

当密钥进行演练测试时遵循：公司标识-test-001-日期  
Naming rules to be followed during key practice test: company logo - test-001 - date

如：密钥JK-MY-YL-公司名称-001-20150822  
For example: key JK-MY-YL- company name -001-20150822

# 7记录表单 Record Sheets

《保险箱存取记录表》  
Safe Box Access Record

《密钥储存记录表》  
Key Storage Record

《密钥加载记录表》  
Key Loading Record

《密钥存取记录表》  
Key Access Record

《密钥生成记录表》  
Key Generation Record

《HSM、密钥管理系统检查表》  
Sheet for Inspection of HSM and Key Management System

《密钥访问日志》  
Key Access Log