Terminal Quality Management Requirements

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Chapter 1 - Introduction

This chapter contains information that helps you understand and use this document.

1.1 Scope

This document describes the Mastercard specific requirements that a **Vendor** shall comply with to obtain a Terminal Quality Management Label (TQM Label).

The compliance to these requirements is assessed during the TQM process. A TQM Label is granted at the end of this process. This process is defined in the Terminal Quality Management – Process [TQM/GEN/T01].

1.2 Audience

This document is intended for Vendors who wish to obtain a Terminal Quality Management Label.

1.3 Language Use

This document uses U.S. English spelling and grammar rules. Exceptionally, the local English spelling is used for proper nouns.

Verbal Forms: In this document, the following verbal forms are used:

— "shall" indicates a requirement;

— "should" indicates a recommendation;

— "may" indicates a permission;

— "can" indicates a possibility or a capability.

Information marked as "NOTE" is for guidance in understanding or clarifying the associated requirement.

1.4 Notations

This document combines the description of TQM activities for contact and contactless products.

1.5 Related Information

The following reference materials may be of use to the reader of this document:

Mastercard Information:

- Terminal Quality Management – Process [TQM/GEN/T01]
- Terminal Integration Process Guide (EMV and Contactless)

ISO standards:

- ISO9001:2015: Quality management systems - Requirements
- ISO10007: 2017: Quality management - Guidelines for configuration management
- ISO19011: 2018: Guidelines for auditing management systems

Other reference materials are listed in the "Technology-specific Terminology and Information" section in the appendix.

First use of an acronym, abbreviation or definition is shown in **Bold**, its meaning is described in the Appendices.

1.6 Revision

The information in this document supersedes and replaces all previous versions (including drafts) issued.

Information in this document is subject to change. Any such changes shall update the current version of the document.

1.7 Terminal Quality Management (TQM)

Mastercard has developed and relies on comprehensive test and approval processes for products in order to promote world-wide interoperability at an acceptable time and cost to all parties.

The objective of these processes is to ensure that each terminal: *Operates, Everywhere, Every time*

One of these processes is the Terminal Type Approval Level 1 (**TTA L1**). During TTAL1, the **IFM** or the **PCD** is tested against the related Technical Specifications.

Another process is Terminal Quality Management (TQM) that is Mastercard's way of ensuring that samples received for TTA L1 Test are:

- Representative: ensuring that the samples are valid examples of the product which has been designed.
- Repeatable: ensuring that the samples are valid examples of the product which is to be delivered in production volumes in the future.
- Reliable: ensuring that evolutions of the tested product remain compliant with Technical Specifications.

TQM defines in this document, a set of requirements Vendors shall meet. Meeting these requirements results in the granting of a TQM Label. The product TQM Label is mandatory for Acquirers going through Mastercard's Terminal Integration Process (M-TIP).

These requirements mandate the Vendor to operate a Configuration Management System to:

- Define and follow the configuration of its Products and the impact of changes on their compliance with the relevant Technical Specifications throughout their life cycle

The purpose is to obtain confidence that any Products used in the field and embedding a PCD or an IFM that has successfully passed Terminal Type Approval Level 1 remains compliant with the Technical Specifications.

The scope of the auditing activities associated with this scheme extends to the configuration management by vendors for all elements of a product in which an IFM or PCD is embedded, including the elements of a product that have been tested to TTA L2 requirements.

Vendors shall declare in which Products their IFMs and PCDs are to incorporated/integrated.

Note 1 The configuration management of L2 hardware and software is within the scope of TQM. The configuration management of L2 hardware and software will not be assessed during a TID or VOD review but shall be within the scope of a TQM audit.

1.8 TQM process

The TQM application & assessment process is defined in TQM/GEN/T01

1.8.1 TID submission

A Vendor submits a TID questionnaire plus supporting documents for every IFM or PCD, the TID

- Describes the EMVCo Level 1 type approval configuration
- Describes the current configuration where revisions have been made
- Details of the Level 2 kernel version
- List of the payment terminals embedding the IFM/PCD

TIDs are submitted when an IFM or PCD is entered into the scheme, TIDs are resubmitted and reassessed when:

- TQM relevant changes are made to the payment terminal (for which IFM / PCD are integrated)
- An IFM or PCD is changed or updated
- The Level 2 kernel is changed or updated
- When any other relevant changes are made

The TID records the manufacturing documentation required, this shall be subject to audit.

1.8.2 VOD submission

The vendor submits a VOD questionnaire plus supporting docs describing their TQM configuration management system and the implementation of the requirements of this document within their QMS.

VODs are submitted when an IFM or PCD is initially entered into the scheme and are to be resubmitted and reassessed when any changes occur.

1.8.3 OEM components submissions

TQM defines two types of OEM (Original Equipment Manufacturer).

The TQM label is issued to the party (Vendor) to whom the Level 1 LoA is issued and referenced on the EMVCo website.

1.8.3.1 OEM Type – Configuration / Assembly control

Vendors who utilise an OEM product and are responsible for the final assembly, maintenance of configurable items, software loading or personalization of the products are required to submit, as a minimum, the following documents to support their TQM application:

- Documented processes and procedures demonstrating the Vendor's control of the design, configuration management and on-going TQM compliance of the OEM components

Vendors who utilise an OEM product and are responsible for the final assembly, maintenance of configurable items, software loading or personalization of the products shall facilitate audits at all of the OEM premises (Design and Manufacturing), to ensure on-going compliance.

Note 1 These requirements are in addition to all other TID & VOD supporting documentation

1.8.3.2 OEM Type – Off the shelf purchase

Vendors who utilise an OEM product and have no responsibility for final assembly, maintenance of configurable items, software loading or personalization of the products shall be required to submit documentation to demonstrate contractual agreements between them and the OEM manufacturer to verify:

- They have no direct control of the configuration or maintenance of compliance for the product
- Ensure that the OEM maintains the compliance of the IFM(s) / PCD(s) with the EMVCo Level 1 type approval configuration & Level 2 kernel
- Ensure that the OEM maintains the compliance of the IFM(s) / PCD(s) with the EMVCo Level 2 kernel

The Vendor shall hold records of all configuration changes of the IFM(s) / PCD(s) from the OEM.

Vendors who have no control of the configuration or maintenance of compliance for a product shall be required to have a statement of compliance issued on an annual basis. No audit of their facilities will be required.

1.9 Supporting Standards

TQM requirements are based on two international series of standards:

- ISO9001:2015 for its system management principles.
- ISO10007:2017 for its configuration management principles.

1.10 Management System Requirements

Vendors applying for TQM approval shall hold one of the following for the design and manufacturing sites that are within the scope of the approval:

- ISO9001:2015 certification
- TL9000 Release 3.0 certification
- IATF 16949:2016 certification

This certification shall be accredited by a National Accreditation Body that is a signatory to the IAF MoU (http://www.iaf.nu//articles/IAF_MEMBERS_SIGNATORIES/4)

Note: Refer to TQM/GEN/T01 V2.1 clause 4.5.2 for Vendors without ISO 9001 (or equivalent) certification.

1.11 Configuration Management Principles

Configuration management principles provide structure for managing identification and traceability, the status of its physical and functional requirements and access to accurate information in all phases of the life cycle.

Configuration management in ISO10007:2017 is based on four activities:

- Product Configuration Identification: identify and document the functional and physical characteristics of Configuration Items (CIs).
- Product Change Control: control changes to CIs and their related documentation.
- Product Configuration Status Accounting: record and report information needed to manage CIs effectively, including the status of proposed changes and the implementation status of approved changes.
- Product Configuration Audit: audit the CIs to verify conformance to specifications, interface control documents and other requirements.

1.12 Configuration Management System (CMS)

TQM defines requirements for a Configuration Management System for Products that are or are intended to be used within the Mastercard payment network.

An organization that adopts the above approach (See Management System Requirements) creates confidence in the capability of its processes and the configuration management of its products and provides a basis for continual improvement.

Note: It is not a requirement of TQM that a vendor fully implements the requirements of ISO10007:2017.

1.13 Audit of the TQM Requirements

Every product included in TQM label(s) shall be subject to audit by Mastercard to these requirements.

Each Vendor audit shall include the configuration management controls for both L1 and L2 hardware & software for each approved Product or Implementation.

1.14 Requirements Overview

The following paragraphs provide an overview of each chapter of the requirements.

1.14.1 Management Responsibility

This chapter defines management requirements for the Vendor in order to obtain its commitment to develop, implement, maintain and improve on meeting TQM requirements.

- Management commitment
- Configuration management policy
- Configuration management planning
- Responsibility and authority
- TQM Manager
- Approval Authority
- Management review
- Resource management
- Supplier management
- Audit of management responsibility

1.14.2 Product Design

This chapter defines the requirements for the management of the Product's design.

- General requirements
- Documentation requirements
- Product configuration management
- Configuration Identification
- Configuration Information
- Product Configuration Status Accounting
- Organizational interfaces management

The Vendor shall perform audits to determine if the Product Design process is operated correctly and efficiently. These audits shall lead to analysis and preventive and corrective actions in order to improve the Product Design process including configuration management.

1.14.3 Manufacturing and Service Provision

This chapter defines the requirements for manufacturing and servicing a Product.

- Interfaces with manufacturing and service provision
- Supplier management
- Communication regarding compliance with Technical Specifications
- Supplier responsibilities
- Requirements for assessing alternative components
- Controls for producing and controlling production process and assembly documentation
- Controls for producing and controlling automated manufacturing processes
- Software version at manufacturing
- Minimum requirements for final testing of Products and Implementations

1.14.4 Measurement, Analysis and Improvement

This chapter defines requirements for the implementation of processes for measurement, analysis and improvement of the product design processes including configuration management.

- General requirements
- Interoperability Issues
- Internal audit
- Monitoring and measurement of configuration processes
- Monitoring and measurement of Product Configuration
- Control of Non-Conforming Product
- Analysis of data
- Continual improvement
- Feedback Process on TQM Compliance
- Nonconformity and corrective action

Chapter 2 – Management Responsibility

2.1 Management commitment

Top management shall provide evidence of its commitment to the development, implementation, maintenance and improvement of the TQM system requirements:

- Communicating to the organization the importance of meeting these TQM requirements
- Establishing the configuration policy
- Ensuring that measurable configuration objectives are established
- Conducting management reviews
- Ensuring the availability of resources.

2.2 Configuration management policy

Top management shall ensure that the configuration management policy:

- Is appropriate to the purpose of the organization
- Includes a commitment to comply with these requirements and continually improve the effectiveness of the configuration management system
- Provides a framework for establishing and reviewing configuration objectives
- Is communicated and understood within the organization
- Is reviewed for continuing suitability.

2.3 Configuration management planning

Top management shall ensure that:

- Planning of configuration management is carried out in order to meet TQM requirements.
- The integrity of configuration management is maintained when changes to the configuration management system are planned and implemented.

2.4 Responsibility and authority

Top management shall ensure that responsibilities and authorities are defined and communicated within the organization.

2.5 TQM Manager

Top management shall appoint a member of management who, irrespective of other responsibilities, shall have responsibility and authority that includes:

- Ensuring that the processes needed to meet the requirements of this document are established, implemented and maintained
- Ensuring that the documentation needed for TQM are established, implemented and maintained
- Reporting to top management on meeting these requirements and any need for improvement
- Ensuring the awareness of TQM requirements throughout the organization.

Note 1 The responsibility of a TQM Manager can include liaison with external parties on matters relating to TQM requirements.

Note 2 The TQM Manager is the contact person for the purposes of TQM.

2.6 Approval Authority (Design Authority)

For each Product, top management shall assign a person or a group of persons (the Product Approval Authority) with responsibility and authority to make decisions on Product Configuration.

The Product Approval Authority shall be competent and knowledgeable about compliance with the relevant Technical Specifications, the relevant sections of these requirements and the implementation of configuration management.

Note 1 Product Approval Authority can also be the Dispositioning Authority, Configuration Control Board, Change Approval Board or Product Approval Board.

2.7 Management review

Top management shall review the implementation of the requirements of this document at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing opportunities for improvement and the need for changes, including the configuration policy and configuration objectives.

As a minimum, the following inputs shall be included in the management review:

- Status and review of actions from previous management reviews
- Review of the suitability of Configuration Management policy
- Review of the Configuration Management objectives
- Review of changes to the Configuration Management System
- Changes that can affect the Configuration Management System
- Results of audits (internal and external, including audits of suppliers)
- Review of interoperability issues
- Process performance
- Product configuration conformity
- Status of preventive and corrective actions
- Resources (Personnel and infrastructure)
- Recommendations for improvement

As a minimum, the following outputs shall be included in the management review. Decisions, actions or recommendations for improvement, including but not limited to:

- Improvement of the effectiveness of the Configuration Management System
- Improvement of the effectiveness of the TQM processes
- Improvement of Product interoperability
- Improvement of Product configuration identification
- Resource needs

Records from management reviews shall be maintained (see Control of Records).

2.8 Resource management

The Vendor shall determine and provide the resources needed to implement and maintain the requirements of this document and continually improve its effectiveness.

Personnel performing work affecting product configuration shall be competent on the basis of appropriate education, training, skills and experience.

The Vendor shall:

- Determine the necessary competence for personnel performing work affecting product configuration
- Provide training or take other actions to satisfy these needs
- Evaluate the effectiveness of the actions taken
- Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the configuration objectives
- Maintain appropriate records of education, training, skills and experience (see Control of Records).

The Vendor shall determine, provide and maintain the infrastructure needed to achieve conformity to requirements of this document. Infrastructure includes:

- Process equipment (test tools, configuration management database(s), support software)
- Supporting services (such as communications)

2.9 Supplier management

Suppliers of services, components and parts to Vendors are categorised as follows:

Category 1: A supplier who supplies services, components or parts that are not critical to compliance of the product with TQM requirements.

Category 2: A supplier who supplies services, components or parts which may have an effect on compliance of the product with TQM requirements, e.g. a supplier of critical components, or a supplier who purchases critical components under their control.

Category 3: Suppliers who supply services, components or parts which are critical to the compliance of the product with the TQM requirements e.g. suppliers who carry out design, validation testing, manufacturing testing, critical processes, service or repair.

No specific requirements apply to Category 1 suppliers.

Note: Suppliers of major parts of the fabrication process that are required to be listed on the TQM scope (e.g. SMT and physical assembly) are not categorised in accordance with this section

Category 2 and 3 suppliers shall hold one of the following for sites supplying products or services used by the Vendor:

- ISO9001:2015 certification
- TL9000 Release 3.0 certification
- IATF 16949:2016 certification

Note: This certification shall be accredited by a National Accreditation Body that is a signatory to the IAF MoU (http://www.iaf.nu//articles/IAF_MEMBERS_SIGNATORIES/4)

In addition, for Category 2 & 3 suppliers, planned audits of the supplier shall be undertaken by the Vendor to ensure that the applicable requirements of this document are implemented, maintained and in use. Records of these audits shall be made available to Mastercard (See Control of Records).

Mastercard reserve the right to audit Category 2 suppliers if doubt is raised during a Category 3 audit or during a VOD assessment that the Category 2 supplier should be classified as a Category 3 supplier. Category 3 suppliers shall be audited on behalf Mastercard as part of the TQM Vendor approval process.

Chapter 3 – Product Design

3.1 General requirements

The Vendor shall establish, document, implement and maintain a product design process including configuration management and continually improve its effectiveness in accordance with these TQM requirements.

The Vendor shall:

1. Identify the processes needed for the Configuration Management System and their application throughout the organization
2. Determine the sequence and interaction of these processes
3. Determine criteria and methods needed to ensure that both the operation and control of these processes are effective
4. Ensure the availability of resources and information necessary to support the operation and monitoring of these processes
5. Monitor, measure and analyze these processes
6. Implement actions necessary to achieve planned results and continual improvement of these processes

These processes shall be managed by the Vendor in accordance with these TQM requirements.

Where a Vendor chooses to outsource any process that affects product configuration (a Category 3 supplier), it shall ensure control over such processes (see Supplier Management). Control of such outsourced processes shall be identified within the configuration management system.

3.2 Documentation requirements

Product design documentation shall include:

1. Documented processes required by these TQM requirements
2. Documented statements of a configuration policy and configuration objectives
3. Documentation needed by the Vendor to ensure the effective planning, operation and control of its processes
4. Records and reports required by these TQM requirements.

3.2.1 Control of Documents

Documents required by the Configuration Management System shall be controlled. Records are a special type of document and shall be controlled according to the requirements given in Control of Records.

A documented procedure shall be established to define the controls needed:

- To approve documents for adequacy prior to issue
- To review and update as necessary and re-approve documents
- To ensure that changes and the current revision status of documents are identified
- To ensure that relevant versions of applicable documents are available at points of use
- To ensure that documents remain legible and readily identifiable
- To ensure that documents of external origin, are identified and their distribution controlled
- To prevent the unintended use of obsolete documents and to apply suitable identification to them if they are retained for any purpose

3.2.2 Control of Records

Records shall be established and maintained to provide evidence of conformity to requirements and of the effective operation of the configuration management system.

Records shall remain legible, readily identifiable and retrievable. A documented procedure shall be established to define the controls needed for the identification, storage, protection, retrieval, retention time and disposition of records.

3.3 Product configuration management

3.3.1 Product life cycle model

The Vendor shall establish and maintain an integrated set of requirements that covers the life cycle of its Products and Implementations.

These requirements shall define:

- The Product and Implementation life cycle stages
- The configuration processes, activities and tasks that are appropriate to each stage of the Product and Implementation life cycle including:
    1. Configuration Items identification and registration
    2. Establishment of Configuration Items baselines whenever it is necessary to define a reference for further activities
    3. Configuration review, verification and validation
    4. The responsibilities and authorities for Product configuration.

Note 1 These requirements shall help the Vendor to identify and manage the interfaces between different groups, within and outside the organization, involved in a Product life cycle to ensure effective communication and clear assignment of responsibility.

Note 2 Product and Implementation life cycle stages should include: concept, definition, development, production, operation, maintenance spanning the Product and Implementation life cycle.

3.3.2 Configuration management plan

The Vendor shall plan and control the configuration management by establishing and maintaining a configuration management plan based on the product life cycle model.

In the situation where the implementation is intended to be used in several products, the vendor shall establish and maintain a configuration management plan for each implementation.

In planning the Product or Implementation configuration, the Vendor shall determine the following:

- Configuration objectives and requirements for the Product and Implementation configuration (including those specified in these TQM requirements).

The need to establish processes, documentation (including configuration information), baselines and to provide resources specific to the Product and Implementation configuration

- Required verification, validation, monitoring, inspection and test activities specific to the Product configuration and the criteria for Product and Implementation configuration acceptance
- Records needed to provide evidence that the configuration processes and resulting Product and Implementation configuration meet requirements (see Control of Records)
- Project organizational structure including:
  - Identification of the interfaces between different groups and entities, within and outside the organization
  - Definition of project roles and responsibilities regarding configuration management
  - Relevant standards, configuration management procedure(s) and tools to be used
  - Qualification and training needs for configuration management and TQM.

The output of this planning shall be documented, approved and controlled in a form suitable for the organization's method of operations.

Note 1 Interfaces between internal groups, for example but not limited to: Product Development (R&D) / Production Control, Product Development (R&D) / Purchasing, Product Development (R&D): Software Team / Hardware Team / Validation Team, Product Development (R&D) / Product Support (Bugs and Interoperability Issues) etc.
Interfaces with external organizations, for example but not limited to: Suppliers, Test Laboratories, EMVCo, TQM Assessment Body, Mastercard etc.

Note 2 The Product or Implementation configuration management plan may be an independent document, a part of another document, or comprised of several documents. TQM questionnaires (VOD and TID) can be used to define parts of the Product configuration management plan.

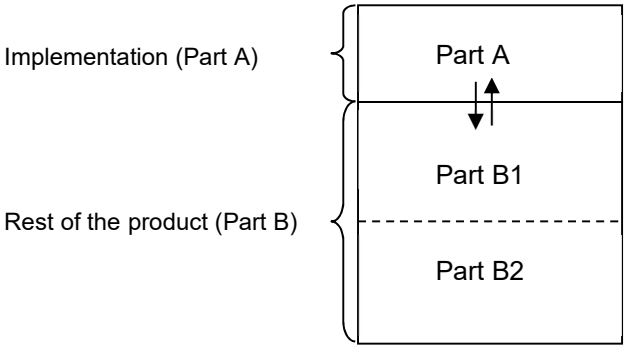
Note 3 General work instructions defining tasks and responsibilities common to all projects need not be replicated as part of a Product configuration management plan.

3.4 Configuration identification

3.4.1 Implementation Critical Configurations Items

The Product Configuration Items (CI) are divided into three sets, as illustrated in Figure 5.1.

Figure 3.1— Product Partition for TQM



Part A: the set of CIs the Vendor defines as the Implementation, fulfilling all requirements of the relevant Technical Specifications. It includes the hardware and software dedicated to and/or involved in the Implementation functionalities. This part is defined by the Vendor's internal specification for the Implementation.

Part B1: the set of CIs that are not part of the Implementation that interface with the Implementation (for example used by Part A / connected to Part A) or have a direct impact on the behavior of the Implementation. This part, also called Implementation Environment, shall be compliant with the Implementation Interface specification.

Part B2: the set of CIs of the rest of the Product that have no direct link with part A and do not impact the Implementation behavior. These CIs are not relevant for TQM purposes.

Note 4 Where hardware and software resources are shared by the Implementation and the rest of the Product, the Vendor is responsible for determining whether they are part A components or can be considered as part B1 components which will depend on the product architecture. Examples of such resources include CPU, memory, unpopulated Printed Circuit Boards (PCB), Operating System, Drivers, Utilities.

The Vendor shall identify and record in the Configuration Management Database (**CMDB**) the Configuration Items within the Product that have an impact on the compliance of the Implementation with the relevant Technical Specifications. Such Configuration Items comprise those from part A and B1.

The part of the Product to which a CI belongs shall be identified as an attribute of the CI and shall be recorded in the CMDB.

3.4.2 Configuration Items Relationships Identification

The relationships between the configuration items shall be identified and recorded in the CMDB.

The hierarchy of Implementation critical CIs within a Product shall be documented in a tree structure called the Product Configuration Tree.

Note 1 The purpose of the Product Configuration tree is to allow Mastercard to easily identify the differences of Implementation critical CIs between two Products.

The Product Configuration Tree shall have the following structure:

The Product Configuration Tree shall contain two sub-trees:

- The A tree (also called Implementation Configuration Tree): tree structure presenting the CIs from part A of the Product, down to the lowest level of independent change. The root of the A tree shall be identified by the Implementation identifier (Implementation ID).
- The B1 tree: tree structure listing the CIs from part B1 of the Product.

The A and the B1 trees shall have the root of the Product Configuration Tree as a direct parent.

The Implementation Configuration Tree shall be composed of two sub-trees:

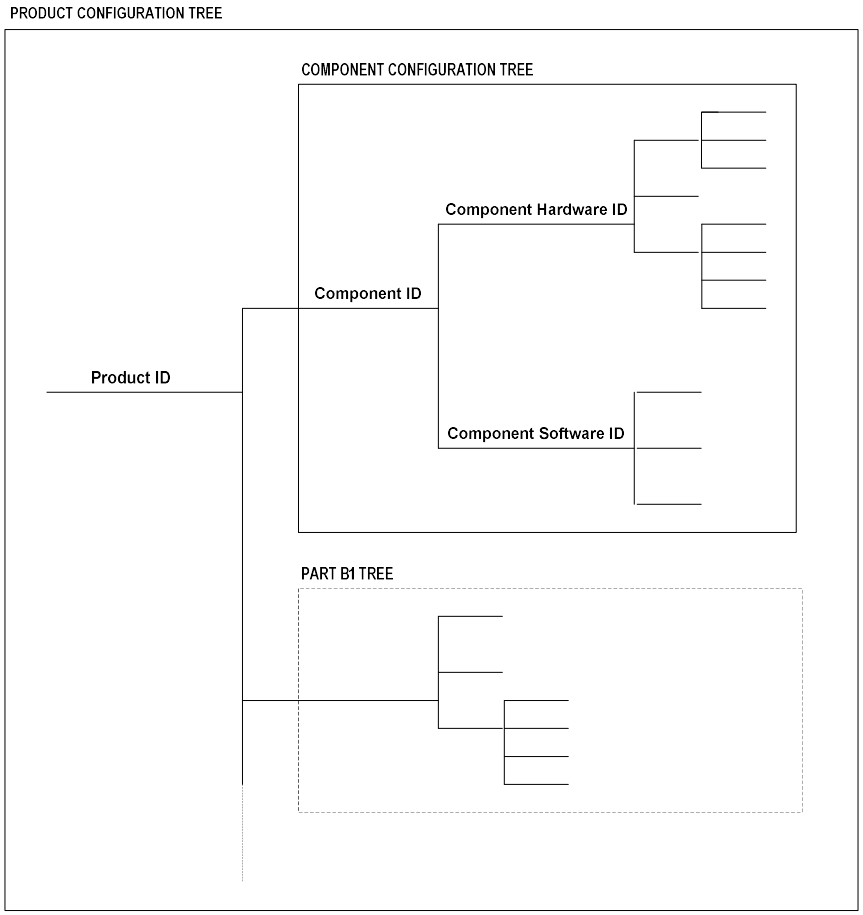
- Implementation hardware tree: tree structure listing the hardware CIs from part A of the Product.
- Implementation software tree: tree structure listing the software CIs from part A of the Product.

The root of the Implementation hardware and software tree shall be identified by the identifiers of the Implementation hardware (Implementation Hardware ID) and software (Implementation Software ID).

The root of the Product Configuration Tree is identified by the Product ID.

The Product ID, Implementation ID, Implementation Hardware ID and Implementation Software ID within the **DUT** Configuration Tree shall be the ones declared in the **ICS** for **Terminal Type Approval Level 1** and reported on the **Level 1 and Level 2 Letter of Approval or implementation evolutions that have been validated by processes conforming to the TQM Requirements.**

Figure 3.2—Product Configuration Tree



Note 2 The Product Configuration Tree may also contain a B2 sub-tree. However, this sub-tree is not relevant from a TQM perspective.

Note 3 The definition of the level of breakdown for Configuration Items for the B1 tree is left to the Vendor. However, the Vendor shall be aware that an insufficient level of breakdown may not prove the limited impact of a change to Mastercard.

Note 4 The Implementation and Product Configuration Trees should preferably be directly generated from the CMDB. However, any kind of documentation is accepted (specifically created document, organized set of print screens, etc.).

Note 5 Any discrepancy from the declared hardware revision associated with Part A or B1 components and that found at audit shall be raised as a major nonconformity.

3.5 Configuration Information

Implementation and Product configuration information shall be developed, established and maintained throughout the Product life cycle.

The Implementation configuration information shall be managed separately from the configuration information of the Product.

3.5.1 Implementation Configuration Information

Implementation Configuration Information shall include (but is not limited to):

- Implementation Configuration Management Plan
- Vendor's internal specifications for the Implementation, including:
    - Implementation Functionalities to be achieved including reference to the relevant Technical Specifications issue.
    - Hardware and software architecture of the Implementation
    - Parts list
    - Source codes list
    - Technical documentation of CIs (chipset, ASIC) if any
    - Requirements for Implementation CIs implementation
        - Electrical schematics
        - Antenna layout
        - Drawings (Implementation layout)
    - Requirements for Implementation software development chain
    - Requirements for Implementation hardware integration (exploded diagram or assembly drawings)
    - Requirements for Implementation software integration (loading process)
    - Requirements for Implementation CIs identification
        - Conventions to be used
        - Implementation Configuration Tree
    - Qualifications methods to be used to check compliance of the Implementation with the relevant Technical Specifications
- Vendor's internal specifications for the Implementation interface, including:
    - Requirements for power supply
    - Definition of the Implementation software interface (APIs, APDUs) with the rest of the Terminal (Level 2)
    - Requirements for antenna landing zone
    - Requirements for Implementation critical CIs (part B1) identification and Conventions to be used
    - Guidelines for implementation of the Implementation within a Product
    - Qualifications methods to be used to check the compliance of a Product with the Implementation interface specification.
- TQM documents:
    - Related TID, VOD questionnaires.
    - Implementation Conformance Statement (ICS)
    - Letter of Approval once obtained (Level 1)
    - TTA L1 Test Report including ICS submitted for TTA L1.

3.5.2 Product Configuration Information

Product Configuration Information shall include (but not limited to):

- Product Configuration Management Plan including Reference to the relevant Implementation Configuration Information
- Product specifications:
  - Hardware and software architecture of the Product
  - Diagram(s) depicting the interfaces between the Implementation and the Product
  - Antenna landing zone
  - Implementation power supply
  - Printed Circuit Boards layout
  - Implementation critical CIs identification (parts A and B1) and Product Configuration Tree
- Support documentation:
  - Guidelines for application software development
  - Manufacturing package
  - Guidelines for installation, software loading, use and maintenance
  - Maintenance package
- TQM documents:
  - Product configuration audit report
  - Proof of compliance continuity with the relevant Technical Specifications

3.5.3 Naming and numbering conventions

Unique naming and numbering conventions shall be established and documented that define methods for:

- Allocation of a unique identifier to each selected Configuration Item and Configuration Information
- Identification of change control information such as revision status
- Identification of the Implementation ID, Implementation hardware ID and Implementation software ID
- Identification of New Implementation Versions and Derived Implementations
- Identification of Product ID.

These conventions shall allow the unique identification of a Configuration Item to be traceable to its associated documentation and vice-versa.

Note 1 Naming and numbering conventions can be specific to one Implementation or be common to all projects.

These conventions shall allow Mastercard and Mastercard customers (or their agents) to be certain that a Product is covered by a TQM Label.

Note 2 The identifiers could for example consist of a combination of fixed or variable alphanumeric characters. The fixed characters would be identical for all New Implementation Versions or Derived Implementations.

Another solution could be to structure the identifiers in the following manner:

ID = Name + V+v, where:

- v is incremented when the change leads to a change of ID without change of Implementation specification
- V is incremented when the change leads to a change of ID with change of Implementation specification
- Name is unchanged for New Versions or Derived Implementations.

3.5.4 Configuration baselines

The Vendor shall establish and approve item configuration baselines, whenever needed in the product life cycle (see Configuration Management Plan.). These item configuration baselines shall record the configuration information of this item at the specific time or stage of its lifecycle.

In particular, a Product Configuration baseline shall be established, named/numbered and approved for each release of Product configuration information, including the one leading to the manufacturing of DUT submitted to Test Laboratories. The level of details to which the Product is defined in this baseline shall be compliant with the Product Configuration Information requirements.

Note The level of detail to which an item is defined in a configuration baseline depends on the degree of control required at the related stage of the item life cycle.

3.5.5 Change control

After the initial release of product configuration information to allow manufacture of the Product to be tested for EMVCo TTA L1 conformity, all changes to all parts shall be controlled.

The process for controlling change shall be documented and shall include the following:

- Initiation, identification and documentation of the need for change
- Categorization of the change
- Evaluation of the consequences of the change
- Compliance with the Technical specifications
- Compliance with the Vendor's internal specifications for implementation
- Compliance with the Vendor's internal specifications for implementation interface
- Approval of the change
- Implementation and verification of the change

The process definition shall define the associated responsibilities and forms to be used.

3.5.5.1 Initiation, Identification and Documentation of the need for change

Prior to submission for evaluation to the dispositioning authority, all change proposals should be identified and documented.

Change proposals shall include at least the following information:

- The reason for the change
- A description of the proposed change
- Configuration Item(s) and related configuration information to be changed, including details of their title(s) and current revision status
- Details of other Configuration Items or Configuration Information that may be affected by the change.

3.5.5.2 Categorization of the change

Any risk, arising from the change, on the following shall be identified and recorded:

- Noncompliance with the relevant Technical Specifications
- Noncompliance with the Vendor's internal specifications for the Implementation
- Noncompliance with the Vendor's internal specifications for Implementation interface

A change with one of these risks shall be categorized as an Implementation critical (Major) change.

Changes outside the risks above are Minor changes, unless the changes affect Fit, Form or Function, which then shall also be categorized as Major changes.

The categorization shall be recorded.

3.5.5.3 Evaluation of the consequences of the change

When a change is categorized as a Major change, its consequences shall be evaluated before acceptance of the change by the Vendor.

For this purpose, the Vendor shall assess the continuity of the compliance with the relevant Technical Specifications.

In the situation where the Vendor can demonstrate that the compliance with the relevant EMV Specification is maintained, the Vendor shall also evaluate the impact on:

- Compliance with Vendor's internal specifications for the Implementation,
- Compliance with the Vendor's internal specifications for Implementation interface

and shall assess the need for Implementation Critical Configuration Items re-identification.

The Vendor shall keep records of the change evaluation (See Control of Records).

3.5.5.4 Compliance with the Technical specifications

The Vendor shall evaluate whether the changed design is still compliant with the relevant Technical Specifications.

There are three options:

- The proof of compliance requires testing of the relevant Technical Specifications functionality. In this case, an EMV TTA L1 or EMV TTA L2 Test session shall be performed by a Test Laboratory.
- The compliance can be proved by design (proof on paper or through tests that do not include TTA L1 or TTA L2 Test to verify the Technical Specifications functionality. In this case, the demonstration and the associated test reports, if any, shall be recorded (See Control of Records).
- The compliance cannot be proved. In this case, the change shall not be accepted.

In the situation of a change of Technical Specifications, a new EMVCo LoA is required to demonstrate compliance of the Product with the changed specification.

Test Laboratories accredited by EMVCo can perform debug or formal EMV TTA L1 and Test Laboratories accredited by Mastercard can perform debug or formal EMV TTA L2 test sessions.:

- In Formal test sessions:
  - The complete set of tests are executed (e.g. analog & digital tests for contactless; mechanical, electrical and protocol tests for contact)
  - A detailed Test Report is issued.
- In debug test sessions:
  - The Vendor can request the execution of only a subset of the tests.
  - A lightweight Test Report is issued.

When the Implementation already has a TQM Label, results of debug test sessions performed in an accredited Laboratory are accepted by Mastercard. Their results are recognized because Mastercard is confident that:

- The change impact and the testing needs have been correctly evaluated
- The configuration information of the tested sample has been recorded
- The sample configuration is uniquely identified
- The sample identification supplied to the laboratory allows traceability to its configuration information

Without TQM label, only formal test sessions are accepted.

Note 1 TTA L1 or TTA L2 tests done internally by the Vendor may not recognized by Mastercard as proof of compliance with Technical Specifications.

Note 2 The configuration management of L2 software is within the scope of TQM. The configuration management of L2 software shall not be assessed during a TID or VOD review but shall be within the scope of a TQM audit.

3.5.5.5 Compliance with the Vendor's internal specifications for implementation

The Vendor shall evaluate whether the modified Implementation still conforms to its specifications by checking if the Fit, Form and Function of any changed item of the Implementation remains compliant with its specifications.

Note 1 A change of supplier for a component is not a change of Fit, Form or Function. For example, replacing a capacitor by an equivalent from another supplier.

There are two cases:

- The modified Implementation still conforms to the Implementation specifications. The modified Implementation is considered a New Version of the Implementation;
- The modified Implementation no longer conforms to the Implementation specifications. New specifications shall be created and the modified Implementation is considered a Derived Implementation.

3.5.5.5 Compliance with the Vendor's internal specifications for implementation interface

The Vendor shall evaluate whether the Product with modified part B1 conforms to the Implementation interface specifications by checking if the Fit, Form and Function of the part B1 that includes the changed item remains compliant with the Implementation interface specifications.

There are two cases:

- The part B1 still conforms to the Implementation interface specifications. The Product is considered as a Derived Product;
- The part B1 does not conform to the Implementation interface specifications. The change is not acceptable unless a deficiency in the Implementation interface specifications can be identified.

3.5.5.6 Re-identification of Configuration Items

The need to re-identify Configuration Items (assign a new identifier) depends on Interchangeability of the superseded and superseding items.

Interchangeability

Two items are considered interchangeable when:

- The Fit, Form and Function of the superseded and superseding items meet the Product specifications
- These previous criteria are met both ways (old in the new and vice-versa)
- These previous criteria are met with no special measures to the item or related item and in all applications (where used).

For instance, a resistor is interchangeable with an equivalent one from another supplier.

The Vendor is responsible for the method used for interchangeability analysis. The interchangeability analysis shall be recorded (See Control of Records).

Re-identification

In the situation where two items are interchangeable, the superseding item does not need to be re-identified, if the traceability is achieved by another means. Otherwise the item shall be re-identified.

In the situation where a superseding item is not interchangeable with the superseded one, the superseding item shall be re-identified. The evaluation of interchangeability and the re-identification shall be pursued back up the Configuration tree until the interchangeability is re-achieved.

The re-identification analysis shall be recorded (See Control of Records).

Note 1 The re-identification back up the Configuration tree could lead to the re-identification of the Implementation-ID, Implementation hardware ID or Implementation software ID.

3.5.5.7 Approval of Change

After a proposed change, has been evaluated, the approval authority shall review the evaluation and shall decide upon the approval of the change.

Prior to approval of a change, the approval authority shall verify that:

- The proposed change is necessary and the consequences would be acceptable
- The change has been properly documented and categorized
- The planned activities for the implementation of the change into Product and Implementation Configuration Information are satisfactory
- The planned activities for submission to Mastercard TQM process are satisfactory.

The change shall be recorded (See Control of Records). Notice of the change shall be circulated to all relevant parties both within and outside the organization.

Note 1 Mastercard are a relevant party outside of a vendor's organization.

3.5.5.8 Implementation and verification of change

After implementation, compliance with the approved change shall be verified. This verification shall be recorded to allow traceability (See Control of Records).

The Vendor shall establish and maintain a documented process(es) which provides traceability of design changes to identifiable manufacturing dates, lots, or serial numbers. This shall enable the Vendor to identify and recall Products that are unfit to remain in service.

3.6 Product Configuration Status Accounting

3.6.1 Product Configuration Records

The Vendor shall perform Product configuration status recording activities throughout the life cycle of the Product in order to support and enable an efficient configuration management process.

The Product configuration records shall include details, when appropriate, of

- The Product Configuration Information (such as identification number, title, effective dates, revision status, change history and its inclusion in any baseline)
- The Product's configuration (such as part numbers, Product design or build status)
- The status of release of new Product Configuration Information
- The processing of changes.

The evolving Product Configuration Information shall be recorded in a manner that identifies the cross-references and interrelationships necessary to provide the required reports to Mastercard at request.

3.6.2 Product Configuration Reports

When needed (at request) the Vendor shall be able to provide records such as:

- A list of Products for which baselines have been established
- A list of Configuration Items included in a specific configuration baseline
- A list of Product Configuration Information included in a specific configuration baseline

A list of configuration baselines containing a specific Configuration Item or a specific Configuration Information

- The current revision status and change history of a specific Configuration Item or a specific Configuration Information
- Status records on changes and concessions
- Details of the status of delivered and maintained Products concerning part and traceability numbers and their revision status
- A list of Products for at least 5 years after delivery of the last Product covered by the relevant TQM Label.

3.7 Organizational interfaces management

The Vendor shall define and maintain documents describing the interface between the different entities –identified in the Product Configuration Management Plan - in terms of:

- Deliverables exchanged between the different entities.
- Responsibilities and authorities to provide and/or receive deliverables (release management)
- Standards and procedures to be followed.
- Common reviews to be conducted.

Note The entities which are not part of the Vendor internal organization are called Suppliers. Manufacturing and Service Providers can be Suppliers.

Chapter 4 Manufacturing and Service

Any manufacturer shall hold one of the following for manufacturing sites that are to be the scope of the TQM approval:

- ISO9001:2015 certification
- TL9000 Release 3.0 certification
- IATF 16949:2016 certification

Note: This certification shall be accredited by a National Accreditation Body that is a signatory to the IAF MoU (http://www.iaf.nu//articles/IAF_MEMBERS_SIGNATORIES/4)

This requirement also applies to any sub-contract manufacturer (Supplier) used by the Vendor (see Supplier Management).

4.1 Interfaces with manufacturing and service provision

4.1.1 Manufacturing and service provision control

The Vendor shall plan and carry out production and service provision under controlled conditions. Controlled conditions shall include, as applicable:

- The availability of information that describes the characteristics of the Product
- The availability of work instructions, as necessary
- The use of suitable equipment
- The availability and use of monitoring and measuring devices
- The implementation of monitoring and measurement
- The implementation of release, delivery and post-delivery activities.

Note Service provision includes processes where deficiencies become apparent only after the Product is in use or the service has been delivered, such as application software development, installation, software loading or maintenance of the Product by third party entities.

The Vendor shall ensure that the controls apply to internal manufacture or manufacture sub-contracted to a Supplier.

4.1.2 Validation of processes for manufacturing

4.1.2.1 Manufacturing qualification process

The Vendor shall implement a manufacturing qualification process. The qualification process shall be applied to each manufacturer and is a precondition for the application of any Product acceptance plan.

The manufacturing qualification process shall include an audit of the quality management system and capability of the Manufacturer.

4.1.2.2 Product Acceptance Plan

The Vendor shall implement a Product Acceptance Plan that defines Vendor's acceptance for product mass production. Product acceptance shall apply to each manufacturer and shall be effective upon completion of the qualification of the manufacturing process.

This Product Acceptance Plan shall include verification of the built Product configuration with its Product configuration information.

4.1.2.3 Manufacturing monitoring

Production control shall include ongoing and scheduled inspections, including Product configuration and configuration processes verification demonstrating the consistency of each Product to its Product Configuration Information.

The Vendor shall make sure that quality variance is effectively analyzed by its manufacturers and that corrective actions are made to remedy any deviations.

4.1.3 Validation of processes for service provision

The Vendor shall validate any processes for service provision.

Validation shall demonstrate the ability of these processes not to alter the conformity of the Product to the relevant Technical Specifications.

The Vendor shall ensure that the processes of the Service Provider prevent the use of non-approved Implementations.

The Vendor shall ensure that any servicing activity cannot change the revision of software of the serviced Product or component, unless specifically authorised by the design authority.

Note In particular, the Vendor shall prevent the use of non-approved combinations of PCD hardware and PCD software or of IFM hardware and IFM software.

The Vendor shall establish arrangements for these processes including, as applicable:

- Defined criteria for review and approval of the processes
- Approval of equipment and qualification of personnel
- Use of specific methods and procedures
- Requirements for records and reports (see Control of Records and Product Configuration Status Accounting)
- Revalidation.

4.2 Supplier management

4.2.1 Supplier selection

The Vendor shall evaluate and select suppliers based on their ability to supply Product in accordance with the Vendor's requirements. Criteria for selection, evaluation and re-evaluation shall be established. Records of the results of evaluations and any necessary actions arising from the evaluation shall be maintained (see Control of Records).

For determining criteria for re-evaluation of suppliers, this section applies.

4.2.2 Supplier Agreement

The Vendor shall establish, document and maintain an agreement with the supplier about Quality and Configuration Management.

The agreement shall document, among others, the Vendor's specifications for the interface between the supplier and the Vendor in terms of:

- Product and process requirements
- Procedures and criteria to be used in monitoring the supplier performance
- Criteria for qualification of sub-contracted process(es)
- Product acceptance criteria.

4.2.3 Supplier responsibilities

The supplier shall not invalidate or jeopardize the integrity the L1 LoA or L2 LoA, the Vendor shall take reasonable actions to ensure this.

4.2.4 Supplier management and monitoring

The Vendor shall have full control over every element of supply and fabrication and have processes in place to ensure that any proposed changes are notified and approved before implementation into manufacture.

4.3 Communication regarding compliance with Technical Specifications

The Vendor shall inform all entities purchasing TQM approved devices regarding their compliance with the Technical Specifications of the devices and shall provide the related EMVCo LoA and TQM Label.

Note If there are any restrictions associated with the L1 LoA this shall be disclosed.

4.5 Requirements for assessing alternative components

The Vendor shall state each component that will be used for manufacturing and the manufacturer of the component at L1 Approval.

The Vendor shall validate any proposed changes to component values or physical characteristics.

The Vendor shall validate any proposed change of component manufacturer. Any change to a part A or B1 component shall have the relevant L1 and or L2 validation report to support the change.

4.6 Controls for producing and controlling production process and assembly documentation

The Vendor shall ensure that the manufacturer(s) have appropriate process instructions in place. Any variation to manufacturing processes shall be approved and validated by the Vendor.

4.7 Controls for producing and controlling automated manufacturing processes

The Vendor shall ensure that an automated manufacturing process is appropriate for the task being performed. Any variation or change to an automated manufacturing process shall be approved and validated by the Vendor.

A Vendor shall be able to demonstrate that the software that is installed in each component has its revision validated.

The Vendor shall be able to demonstrate that effective measures are in place to ensure that the software installed in a component at manufacture cannot be modified after manufacture.

4.8 Minimum requirements for final testing of Products and Implementations.

Products (components) shall be verified and tested at the final production stage, this testing SHALL verify the physical performance of the Product or Implementation across all manufactured products. The testing shall be performed on a physical test bench or tool with traceable test equipment or using some contactless cards as some references. The vendor shall ensure yearly (unless another period is justified) calibration and verification of the test bench or tool or reference Cards used to perform this final test.

For PCD's, as a minimum, PCD to PICC communication shall be established at 0cm and at 4cm using communication signal interface Type A and Type B.

For IFM's, as a minimum, card operation procedures "Activation", "Reset", "information Exchange" and "Deactivation shall be performed with a representation of an integrated circuit card.

As a reminder, the vendor shall perform TTA L1 & TTA L2 tests at Mastercard's discretion at an accredited laboratory as requested by Mastercard.

4.9 Post manufacturing service provisions

If the service or repair centre is not at the same location as the manufacturing facility as the original production of IFM or PCD, the service or repair centre shall be categorised in accordance with Supplier Management.

Vendors shall have a robust process in place for post manufacturing activities including those at service or repair centres to ensure that the integrity of the hardware and software will not be compromised.

If a critical component has been changed or the software reloaded, then the Minimum requirements for final testing of Products and Implementations shall be applied before the products are released.

Chapter 5 Measurement, Analysis and Improvement

This chapter defines requirements for the implementation of processes for measurement, analysis and improvement of the product design processes including configuration management.

5.1 General requirements

The Vendor shall plan and implement the monitoring, measurement, analysis and improvement processes needed to:

- Demonstrate conformity of the Product configuration
- Ensure conformity of the product design process including configuration management
- Continually improve the effectiveness of the product design process.

This shall include determination of applicable methods and the extent of their use.

5.2 Interoperability Issues

The Vendor shall record any interoperability issue regarding a Product by one of its customers, by a subsequent purchaser of the Product, or any other involved entity (e.g. Mastercard).

These records shall describe clearly the problems encountered, their causes and corrective actions taken (see Control of Records).

5.3 Internal audit

The Vendor shall conduct internal audits at planned intervals to ensure that the product design, configuration management, production and service provision, where applicable, meet the requirements of this document. All of the requirements in this document shall be covered, where applicable, at least once every 12 months.

The following shall be defined in a documented procedure:

1. The audit criteria, scope, frequency and audit methods
2. Selection of auditors
3. The responsibilities and requirements for planning and conducting audits
4. Results of the audits are reported to the relevant management
5. Retain documented information as evidence of the implementation of the audit programme and the audit results
6. Follow-up activities shall include the verification of the actions taken and the reporting of verification results

Internal audits shall include a follow up of previous audit results.

The conduct of audits shall ensure objectivity as well as impartiality of the audit process. Auditors shall not audit their own work.

The management responsible for the area being audited shall ensure that actions are taken without undue delay to eliminate detected nonconformities and their causes.

Note See ISO19011:2018 for guidance.

5.4 Monitoring and measurement of configuration processes

The Vendor shall apply suitable methods for monitoring and where applicable, measurement of the Configuration Management System processes. These methods shall demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, corrective action shall be taken, as appropriate, to ensure conformity of the Product configuration.

5.5 Monitoring and measurement of Product Configuration

The Vendor shall monitor and measure the characteristics of the Product to verify that configuration requirements for the Product have been met. This shall be carried out at appropriate stages of the Product life cycle process in accordance with the planned arrangements of the configuration plan.

Configuration audits shall be performed in accordance with documented processes to determine whether a Product conforms to its requirements and Product configuration information.

Two types of Product configuration audits shall be performed in compliance with the planned arrangements:

- A functional configuration audit; this is a formal examination to verify that a Configuration Item has achieved the functional and performance characteristics specified in its Product configuration information;
- A physical configuration audit; this is a formal examination to verify that a Configuration Item has achieved the physical characteristics specified in its Product configuration information.

Evidence of conformity with the acceptance criteria shall be maintained (see Control of Records). Records shall indicate the person(s) authorizing release of Product.

Product release and service delivery shall not proceed until the planned arrangements (see Configuration Management Planning) have been satisfactorily completed, unless otherwise approved by a relevant authority and, where applicable, by the customer.

5.6 Control of Non-Conforming Product

The Vendor shall ensure that Product which does not conform to its Product configuration information is identified and controlled to prevent its unintended use or delivery. The controls and related responsibilities and authorities for dealing with non-conforming Product shall be defined in a documented procedure.

The Vendor shall deal with non-conforming Product by one or more of the following ways:

- By taking action to eliminate the detected non-conformity
- Evaluate the need for action to eliminate the cause(s) of the nonconformity, in order that it does not recur or occur elsewhere
- By taking action to preclude its original intended use or application.
- By authorizing its use, release or acceptance under concession by a relevant authority
- Make changes to the configuration management system, if necessary.

Records of the nature of nonconformities and any subsequent actions taken, including concessions obtained and identifies the authority deciding the action shall be maintained (see Control of Records).

When non-conforming Product is corrected, it shall be subject to re-verification to demonstrate conformity to the requirements.

When non-conforming Product is detected after delivery or use has started, the Vendor shall act appropriate to the effects, or potential effects, of the non-conformity.

5.7 Analysis of data

The Vendor shall determine, collect and analyze appropriate data to demonstrate the suitability and effectiveness of the Management System, specifically addressing the requirements of configuration management and to evaluate where continual improvement can be made. This shall include data generated as a result of monitoring and measurement and from other relevant sources.

The analysis of data shall provide information relating to:

- The compliance with TQM requirements
- Conformity to Product configuration management requirements (see Product Design)
- Characteristics and trends of processes and Products including opportunities for preventive action
- Suppliers

5.8 Continual improvement

The Vendor shall continually improve the effectiveness of the Management System, specifically including configuration management through the use of the Configuration Management policy, Configuration Management objectives, audit results, analysis of data, corrective and preventive actions and management review.

5.9 Feedback Process on TQM Compliance

For any Product, the Vendor shall implement a feed-back process whose objective shall be to regularly capitalize on information collected on similar projects, on information received from any 3rd party suppliers, on feedback from customers or any other reliable source, for TQM compliance of current and future projects of the same nature.

Appendices

Appendix 1 – Acronyms:

The following acronyms are used in this document:

Abbreviation	Description
CI	Configuration Item
CMDB	Configuration Management Database
CMS	Configuration Management System
DUT	Device Under Test
ICC	Integrated Circuit Card
IFM	InterFace Module
ISO	International Organization for Standardization
LoA	Letter of Approval
OEM	Original Equipment Manufacturer
PCD	Proximity Coupling Device
PICC	Proximity Integrated Circuit Card
SMT	Surface Mount Technology
TID	Type Identification Description
TTA L1	Terminal Type Approval Level 1
TQM	Terminal Quality Management
TVTP	Terminal Vendor Testing Process
VOD	Vendor Organization Description

Appendix 2 – Terminology

The following terminology is used in this document:

Approval Authority: Person or group of persons assigned responsibility and authority to make decisions regarding the configuration. The Approval Authority can also be called the Dispositioning Authority or Change Control Board (CCB). [ISO10007:2017]

Automated Manufacturing Process: Any process completed by a computer or a machine. Examples include SMT assembly, software loading programs, final production test software etc.

Change Control: Element of Configuration Management comprising the evaluation, coordination, approval or disapproval and implementation of changes to Configuration Items after formal approval of their Configuration Information.

Concession: A concession is a permission to use or release a product that does not conform to specified requirements within specified limits for an agreed time or quantity of that product. A concession does not affect the configuration baseline. Some organizations use terms such as “waivers” or “deviations” instead of “concession”.

Configuration: Functional and physical characteristics of a product, as defined in technical documents and achieved in the product.

Configuration Audit: Element of Configuration Management consisting of the verification that a Configuration Item conforms to its Configuration Information.

Configuration Identification: Element of Configuration Management consisting of selecting the Configuration Items for a product, assigning unique identifiers to them and recording their functional and physical characteristics in technical documentation (Configuration Information).

Configuration Information: Requirements for product design, realization, verification, operation and support. Product configuration information comprises both product definition and product operational information. [ISO 10007:2017]

Configuration Item (CI): Entity within a Configuration that satisfies an end use function. [ISO 10007:2017].

Configuration Item Baseline: Approved Configuration Information that establishes the characteristics of an item at a specific time in the item’s life cycle and that serves as reference for activities throughout the life cycle of the item.

Configuration Management: Coordinated activities to direct and control Configuration. [ISO 10007:2017]

Configuration Status Reporting: Element of Configuration Management consisting of formalized recording and reporting of information needed to manage a configuration efficiently. This information consists of approved Product Configuration Information, the status of proposed changes to the configuration and the implementation status of approved changes. [ISO 10007:2017]

Configuration Tree: Document showing the hierarchical path from an item down to selected lower level CIs constituting this item. The Implementation configuration tree identifies the Implementation - ID down to the Implementation hardware ID and Implementation software ID declared in the Letter of Approval for Terminal Type Approval Level 1 and down to their lower levels items.

Critical Components: PCD / IFM Part A & B1 compnents.as defined in section 5.2

Device Under Test (DUT): Product that was submitted to TTA L1.

Fit: The ability of an item to physically interface, or interconnect with, or become an integral part of another item.

Form: The defined configuration of an item including the geometrically measured configuration, density and weight or other visual parameters which uniquely characterize an item, component or assembly. For software, form denotes the language, language level and media.

Function: The action or actions which an item is designed to perform.

Identifier (ID): Identifying number which uniquely identifies an item (part number) or a document.

InterFace Module (IFM): Implementation of the Technical Specifications for Contact Terminal Level 1.

Implementation: Means the combination of hardware and software sub-sets of the product implementing the Technical Specifications. It is also called Part A in this document.

Implementation's environment (or Part B1): Component(s) of the Product that are not part of the Implementation but interface with the Implementation (for example used by or connected to the Implementation) or have a direct impact on the behavior of the Implementation.

Interchangeability: Two items of a product are interchangeable when:

- the Fit, Form and Function of the superseded and superseding items meet the product specifications, these previous criteria are met both way (old in the new and vice-versa) and
- these previous criteria are met with no special measures to the item or related item and in all applications (where used).

Interface: The functional and physical characteristics required to exist at a common boundary. Within an organization, a relationship among two or more entities in which the entities share, provide, or exchange data. Interfaces are not items but relationships between them.

Item: Non-specific term used to denote any product, including systems, subsystems, assemblies, sub-assemblies, units, sets, accessories, computer programs, computer software or parts.

Letter of Approval: See "Terminal Type Approval Level 1 Letter of Approval".

Management System: A set of interrelated or interacting elements of an organisation (Vendor) to establish policies, objectives and processes to achieve those objectives.

Manufacturer: Entity responsible of the manufacturing of the products. The Manufacturer can be a Supplier or a Vendor entity.

Proximity Coupling Device (PCD): Implementation of the Technical Specifications for Contactless Terminal Level 1.

Product: Device embedding the Implementation and the Implementation Environment. It can be either a terminal or a standalone card reader.

Release: Distribution of Configuration Information from one entity to another.

Statement of Compliance: Document issued by Mastercard Assessment Body and renewed annually, which lists the Labels issued to the Vendor.

Supplier: Entity having an agreement with the Vendor for the design, development, manufacture, maintenance, modification or supply of items under the terms of this agreement. See Appendix 1.

Supply Chain: Business organization used by the Vendor to design, develop, manufacture, maintain or modify the products.

Technical Specifications: Document defining the specifications against which an implementation is tested and approved for TTA L1.

Terminal: Device used at the point of transaction to perform a financial transaction and incorporating the host communication. It may also include other interfaces and Implementations or be connected to other devices (Card Readers) containing needed Implementations.

Test Laboratory: A facility accredited by EMVCo for performing TTA L1 tests and/or by Mastercard for performing TTA L2 tests.

Terminal Type Approval Level 1 Process (TTA L1 Process): Process used by EMVCo to verify and acknowledge that an Implementation within a Product is compliant with the relevant Technical Specifications.

Terminal Type Approval Level 1 Letter of Approval (TTA L1 LoA): Written acknowledgement by EMVCo that the TTA L1 Test results for vendor's Implementation are in sufficient conformance with the relevant Technical Specifications.

Terminal Type Approval Level 1 Test (TTA L1 Test): Set of tests established by EMVCo to determine whether an Implementation meets the requirements of the related Technical Specifications.

Terminal Type Approval Level 2 Test (TTA L2 Test): Set of tests established by EMVCo (EMVCo L2 contact type approval) & Mastercard (Mastercard L2 Contactless Approval) to determine whether an Implementation meets the requirements of the related Technical Specifications.

TQM Label: Formal recognition from Mastercard that Products:

(1) which embed a specific Implementation which has been granted an EMVCo TTA L1 LoA,

(2) designed by the owner of this LoA

(3) and produced in specified manufacturing sites, are compliant with TQM requirements.

See also: SoC (Statement of Compliance)

Traceability: Ability to trace the history, application or location of that which is under consideration.

Vendor: Entity responsible for the design, development and production of Products or Modules. The Vendor is the entity requesting TQM Label for an Implementation. If this request is accepted, the Vendor is the owner of the TQM Label.

Appendix 3 - Technology-specific Terminology and Information

Contact Terminal Level 1

Implementation Name: Interface Module or IFM

Definition: Virtual or abstract Implementation that contains the necessary hardware and software to power the ICC and to support communication between the Product and the Integrated Circuit Card (ICC) up to the transport layer, as specified in the Technical Specifications.

Contactless Terminal Level 1

Implementation Name: Proximity Coupling Device or PCD

Definition: Peripheral Implementation of the Product, that uses inductive coupling to provide power to a Proximity Integrated Circuit Card (PICC) and also to control the data exchange with the PICC, up to the transport layer (included), as specified in the Technical Specifications.