EUROPEAN COOPERATION

ECSS

FOR SPACE STANDARDIZATION

Space Project Management

Configuration Management

Foreword

This standard is one of the series of ECSS Standards intended to be applied together for the management, engineering and product assurance in space projects and applications. ECSS is a cooperative effort of the European Space Agency, National Space Agencies and European industry associations for the purpose of developing and maintaining common standards.

Requirements in this standard are defined in terms of what must be accomplished, rather than in terms of how to organise and perform the necessary work. This allows existing organisational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standards.

The formulation of this standard takes into account the existing ISO 9000 family of documents.

This standard has been prepared by the ECSS Management Standards Working Group, reviewed by the ECSS Technical Panel and approved by the ECSS Steering Board.

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Introduction

Configuration management is a discipline having two major objectives :

- to identify and document the functional and physical characteristics of a product, to control changes to those characteristics, to record and report change processing and implementation status and to verify compliance with business agreement and other applicable documents,

- to enable all the actors in the project, at any given time during the life–cycle, to use identical data, in the same controlled status.

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Scope

The present document, 'Configuration Management', is part of a collection of ECSS standards belonging to the management branch.

The purpose of this ECSS standard is to define the principles and requirements that shall be respected with regard to the management of the configuration of products within a space project.

This management standard defines all the rules for a proper configuration management.

The requirements specified herein apply to, and affect the supplier and customer at all levels, when the capability to design and supply conforming product needs to be demonstrated. These requirements, as tailored in the related Project Requirements Document, are applicable to any actor of a Space Project.

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References

2.1 Normative References

This ECSS standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this ECSS standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

This ECSS standard belongs to the Space Project Management series called up by the 'Policy and Principles' standard ECSS–M–00. The standards listed below shall be considered in association with this document.

ECSS–M–10   Project Breakdown Structures.

ECSS–M–20   Project Organisation.

ECSS–M–30   Project Phasing and Planning.

ECSS–M–50   Information/Documentation Management.

ECSS–M–60   Cost and Schedule Management.

ECSS–M–70   Integrated Logistic Support.

ISO 10007   Quality Management – Guidelines for configuration management.

The applicable revision index shall be that valid at the time the Project Requirements Documents are created.

2.2 Informative References

RG Aéro 00040   General Recommendation for the Project Management Specification.

CNES IM–40–00   Gestion de la Configuration.

MR–P/01   Management Requirements on Industrial Contracts.
(supersedes ESA PC/941904/TD/510)

ESA PSS–01–11   Configuration Management and Control for ESA Space Systems.

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Definitions and Abbreviations

3.1 Definitions

For the purposes of this standard, the definitions given in ECSS–P–001 Issue 1 apply. In particular, it should be noted that the following terms have a specific definition for use in ECSS standards.

As–built Configuration

Business Agreement

Configuration

Configuration Baseline

Configuration Document

Configuration Item

Contract

Cost

Customer

Data

Development

Deviation

Document

Documentation

Evolution

Implementation Document

Industrial Organisation

Information

Phase (Project Phase)

Process

Product State

Product Tree

Project

Project Requirements Document

Space Element

Space System

Supplier

System

Task

Technical Specification

Waiver

Work Breakdown Structure

The following terms and definitions are specific to this standard and shall be applied.

"Technical description
Technical definition of a product in terms of requirements, design, test and verification documentation, analyses, drawings, products, materials, processes and tooling and is applicable to hardware, software and services."

3.2   Abbreviations

The following abbreviations are defined and used within this standard.

Abbreviation	Meaning
CDR:	Critical Design Review
DJF:	Design Justification File
EIDP:	End Item Data Package
ICD:	Interface Control Document/Drawings
PDR:	Preliminary Design Review
PRR:	Preliminary Requirements Review
QR:	Qualification Review
TS:	Technical Specification
WBS:	Work Breakdown Structure

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Configuration Management Principles

4.1 Objectives

Configuration Management objectives are to:

- know at any moment the technical description of a system and its components, using approved documentation,
- control the evolution in the system's technical description,
- provide traceability of the evolution of the system's technical description,
- facilitate the consistency of the system's components (control of external interfaces) and the products that make up these components (control of internal interfaces),
- verify that documentation is and remains the exact image of the products it describes,
- identify the current configuration baseline and the as-built configuration, in order to deal with discrepancies detected during production, delivery or operation of the product,
- enable any user to know the operational possibilities and limitations of each product item and, in case of nonconformance, to know which items are affected.

4.2 Policy and Principles

Configuration Management is defined as being the management of the technical description of a product, its components and of the controlled successive evolution in that description.

Actors shall implement Configuration Management concurrent with the approval of the Technical Specifications (TS) related to product elements for which they assume design responsibility.

Documents shall be baselined prior to formal configuration control.

Preparatory activities shall be implemented:

- by customers, during phase A, in order to prepare the configuration management Project Requirements Document as a basis for calls for tenders for contracts in later phases,
- by suppliers during phase B to prepare their Implementation Document in reply to the Project Requirements Document for Configuration Management.

4.3   Configuration Management Tasks

Configuration Management comprises organisation, implementation and supervision of the following tasks:

- identification of the configuration; to identify the systems concerned, and to define their descriptive documentation (configuration identification),

- control of the configuration; to establish configuration baselines, to set up and implement change control, control of interfaces (configuration control),

- recording and follow-up of the configuration; to record the product's different configurations, and to permit its use by means of configuration statuses (configuration status accounting),

- to verify that the product design meeting the required attributes has been adequately documented, as well as the verification article's compliance with the design in order to establish the product configuration (configuration verification),

- auditing the Configuration Management system; to verify that the Configuration Management system is effective and meets the requirements.

4.4   Implementation of Configuration Management

The customer is responsible for drawing up the Project Requirements Document for Configuration Management, before the start of phase B. It will be applicable to all the actors of the project according to the requirements for implementation defined by each level customer for his supplier(s).

To reply to the requirements set out in the Project Requirements Document for Configuration Management at each level of industrial organisation, each actor is responsible for drawing up, presenting for approval and executing his own Implementation Document for Configuration Management (cf. sub–clause 5.5).

At the start of phase B, each actor shall assign the organisation in charge of the Configuration Management activities within the project. Its roles, responsibilities and authorities shall be described as defined in ECSS–M–20.

Taking into account business agreements and the Product Tree, each actor is responsible to his customer for his suppliers' configuration management activities, which shall meet the requirements defined by the Project Requirements Document for Configuration Management.

4.5   Configuration Baselines

The principles of configuration management are based on the establishment of configuration reference bases which represent the approved status of requirements and design, and which provide the point of departure for further evolution (see figure 1). These references are called 'Configuration Baselines'.

A configuration baseline is characterised by a (set of) document(s), which describe(s) the characteristics, or certain characteristics of a product. This (set of) document(s) is formally designated as the configuration reference at a key stage in the product life cycle, which thus corresponds to a major product definition event. Any change of a product attribute specified or disclosed in this (set of) document(s) shall be subject to a formal change procedure involving all the actors and disciplines concerned before it can be taken into account.

During the life cycle of the product, the following configuration baselines are elaborated in the following sequence:

- Functional Configuration Baseline (at system level), described in the Functional Specification. This document specifies the system's characteristics in terms of its mission capabilities, as well as the criteria and corresponding levels of acceptance,

- Development Configuration Baseline, described in the Technical Specification (TS). This set of documents specifies the product's characteristics in terms of

technical requirements and constraints, as well as their verification conditions. The Development Configuration Baseline contains also the Design Justification File (DJF),

- Production Configuration Baseline, described in the Production Master File. This set of documents contains all the detailed performance and design attributes required for production, acceptance, operation, support and disposal. The current product configuration documentation – initial at delivery, or as evolved at a certain point in time – serves as the basis for entries in the Log Book, which will be maintained during the utilisation phase. The Production Configuration Baseline contains the final versions of the Interface Control Documents (ICD).

For software life cycle, comparable configuration baselines are defined, taking into account in particular that there is no software manufacturing.

The number of configuration baselines considered depends on the life cycle for software development. In any case, the first Configuration Baseline consists of the software functional specification. This baseline is updated during development up to the final one, which contains all the product elements (source code, generation file, documentation ...) necessary for production, installation, acceptance and operation.

4.6 Configuration Items

A Configuration Item is an aggregation of hardware, software, processed materials, services or any of its discrete portions, that is designated for configuration management and treated as a single entity in the configuration management process (ISO 10007).

Configuration items are identified at various levels of the Product Tree and defined at least by a Technical Specification. Configuration Item assignment provides the means for configuration control of the system including change management, performance verification and contractual boundaries.

In addition to Configuration Items, there can be interchangeable items, which need configuration control limited to identification by marking or labelling.
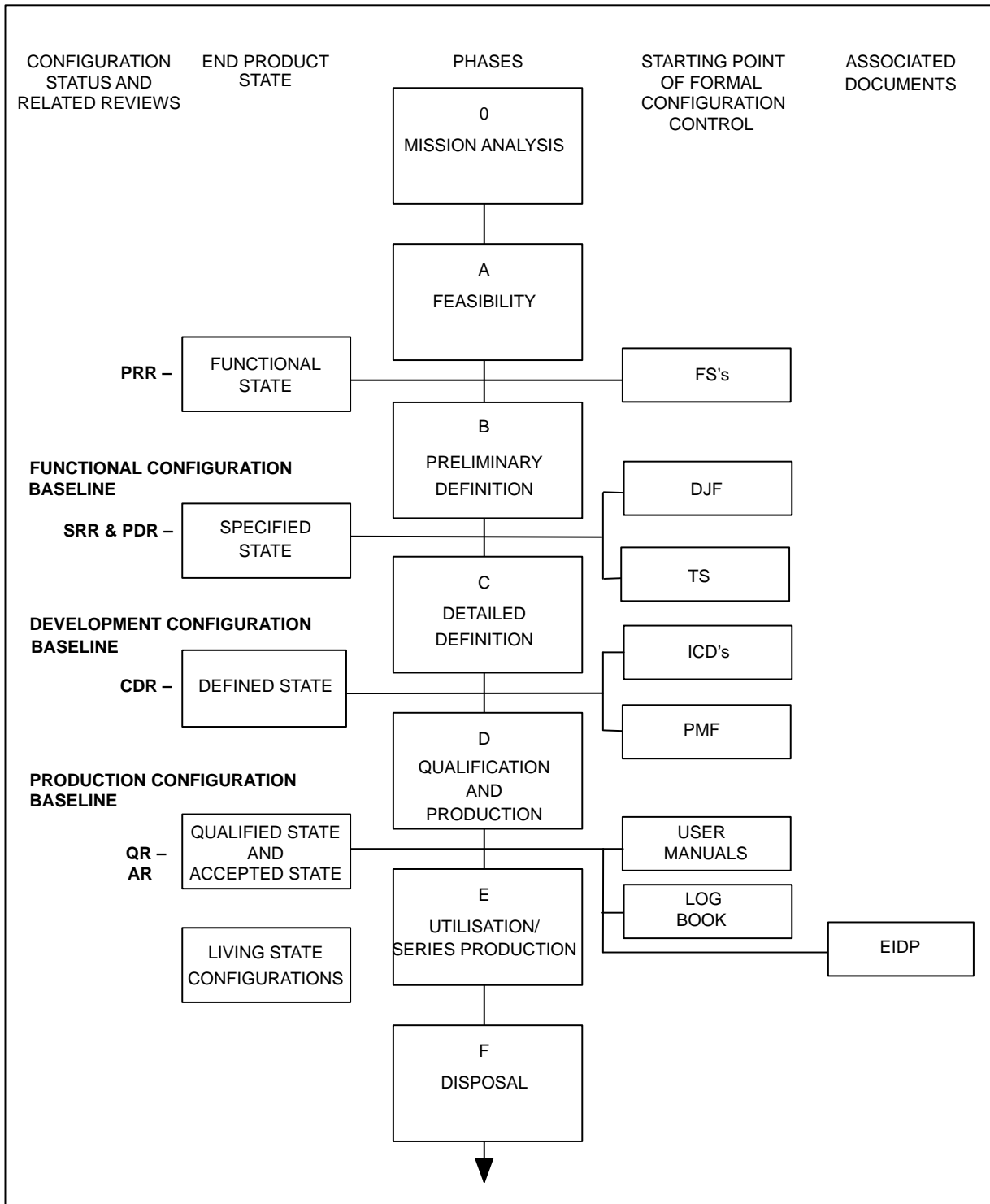
4.6.1 Developed Configuration Item

A developed Configuration Item is a Configuration Item specifically designed by the project. Its configuration management shall conform to the requirements of this standard and shall be carried out by the supplier responsible for its development.

A common element used by several project actors shall be a Configuration Item.

The customer can request any product to become a Configuration Item.

4.6.2 Purchased Configuration Item

Purchased Configuration Items are standardized or 'off the shelf' products which are not developed specifically for the project: they are the subject of supplier definition documentation. Configuration management in accordance with this standard shall be applied to the extent negotiated between the supplier and customer and to the levels of control necessary to satisfy appropriate Configuration Management for the next higher level Configuration Item developed under the Configuration Management requirements of the project.

Also included in this category are any products which have been developed and qualified for another project with comparable constraints and which are re-used without modification.

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Figure 1: Summary Diagram of Configuration Evolution at System Level

CONFIGURATION STATUS AND RELATED REVIEWS | **END PRODUCT STATE** | **PHASES** | **STARTING POINT OF FORMAL CONFIGURATION CONTROL** | **ASSOCIATED DOCUMENTS**

Phases (center column, top to bottom):
- 0 MISSION ANALYSIS
- A FEASIBILITY
- B PRELIMINARY DEFINITION
- C DETAILED DEFINITION
- D QUALIFICATION AND PRODUCTION
- E UTILISATION/ SERIES PRODUCTION
- F DISPOSAL

PRR – FUNCTIONAL STATE — FS's

FUNCTIONAL CONFIGURATION BASELINE

SRR & PDR – SPECIFIED STATE — DJF / TS

DEVELOPMENT CONFIGURATION BASELINE

CDR – DEFINED STATE — ICD's / PMF

PRODUCTION CONFIGURATION BASELINE

QR – / AR – QUALIFIED STATE AND ACCEPTED STATE — USER MANUALS / LOG BOOK / EIDP

LIVING STATE CONFIGURATIONS

NOTE	AR=Acceptance Review	CDR=Critical Design Review
	DJF=Design Justification File	EIDP=End Item Data Pack
	FS=Funtional Specification	
	ICD=Interface Control Document	
	PDR=Preliminary Requirements Review	
	PMF=Production Master File	
	PRR=Preliminary Requirements Review	
	QR=Qualification Review	
	SRR=System Requirement Review	
	TS=Technical Specification	

Figure 1: Summary Diagram of Configuration Evolution at System Level

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Configuration Management Requirements

In this ECSS standard, in order to facilitate reading and traceability, the requirements are listed according to numbered topics. Each numbered requirement is composed of a general wording (bold text), and often by an explanatory text attached to the general requirement and an expected output (text in italics).

5.1 Configuration Identification

5.1.1

Configuration items shall be identified in the Product Tree concurrent with the approval of the Technical Specification, ensuring that the complete system is controlled.

Each supplier shall draw up, obtain his customer's approval of, and keep updated the list of Configuration Items he supplies.

EXPECTED OUTPUT: *List of Configuration Items.*

5.1.2

a. **The starting point of formal configuration control for Functional Specification shall be the Functional Specification approved by the consumer at the end of phase A (PRR).**

b. **The starting point of formal configuration control for Technical Specification shall be:**

   • **the system TS approved after the SRR,**

   • **the product TS approved after the PDR at the end of phase B.**

c. **The starting point of formal configuration control of the Design Justification File shall be the issue of its corresponding Technical Specification.**

d. **The starting point of formal configuration control for the ICDs is the ICDs' version finalised at the CDRs.**

e. **The starting point of formal configuration control for the Production Master File is the version of the file approved after the CDR.**

f. **The starting point of formal configuration control of the User's Manual is the User's Manual version finalised at the Qualification Review.**

g. **The starting point of formal configuration control of the Log Book is the Acceptance Review.**

5.1.3

A unique identification block shall be allocated to each Configuration Item in the Product Tree.

This identification relies on the Product Tree.

It shall remain unchanged during the product's lifetime, unless a modification causes discontinuation of interchangeability.

EXPECTED OUTPUT: *A unique identifier for each Configuration Item.*

5.1.4

A Configuration Item shall be unambiguously defined in the following manner:

– **its complete design description if it is developed for space application,**

– **the list of its performances and interface characteristics (or its procurement specification) if it is a purchased product,**

– **its standardized reference if it is a purchased product defined by a standard in the public domain.**

As an outcome of this definition, the list of constituents to be put under configuration control will be established.

EXPECTED OUTPUT: *Technical description of the Configuration Item.*

5.1.5

All the constituents identified as per 5.1.4 and all the other interchangeable items shall be marked or labelled.

Marking of the constituents shall ensure full identification and traceability.

5.1.6

The documents required to control a Configuration Item shall be identified during phase B and confirmed at the Preliminary Design Review of the corresponding product, or at latest on signing the development business agreement.

AIM: Identify all the documents needed for Configuration Control.

For products mainly made up of hardware, the documents which identify the configuration baselines include:

- the Functional Specification, when applicable,
- the Technical Specification, and general specifications (environment, radiation, design rules, interfaces, …),
- the Interface Control Document,
- the Production Master File,
- the Configuration Items list
- the installation/user/operating/maintenance manuals, of which the recommended contents are defined in ECSS–M–40–08.

For products mainly made up of software, the documents which identify the configuration baselines include:

- the user's requirements,
- the Software Functional Specification,
- the design description,
- the Configuration Items list (modules list),

- the source listing,
- the configuration description of the development tools (e.g. compilers, linkers),

They shall, at any given moment, reflect the actual state of the product.

EXPECTED OUTPUT: *The configuration documentation for the Configuration Items available to the extent required to start phase C.*

5.1.7

The documentation list which identifies the baseline of a Configuration Item shall be approved by the customer.

Prescribed configuration documentation is available at reviews. The successful performance of the review reflects the agreement of the customer on the product characteristics and thus permits configuration baselines to be put into place.

EXPECTED OUTPUT: *The configuration documents of the Configuration Items available for next phase.*

5.1.8

The supplier shall identify and keep up-to-date the baseline of the product states according to figure 1.

This will cover:

- configuration baselines,
- the configuration applicable to the items to be delivered,
- the configuration at delivery of the products.

5.1.9

The consumer shall maintain the baseline of the Configuration Item throughout its use or operation.

For hardware products, the configuration during operation is composed of:

- the configuration at delivery, identified in the End Item Data Package,
- changes made during operation and recorded in the Log Book, of which the recommended contents are defined in ECSS–M–40–07.

For software products, the configuration during operation is identified in the Software Configuration File. Guidelines for Software Configuration File are given in ECSS–M–40–09.

EXPECTED OUTPUT: *Appropriate identification of the Configuration Item throughout the product life-cycle.*

5.1.10

Each product forming a Configuration Item shall bear a unique identifier, which is traceable to its technical description.

AIM: Establish unambiguous links between the Product Tree and the related configuration documentation.

EXPECTED OUTPUT: *Coherent product and documents identification system.*

5.1.11

Interface management responsibilities shall be defined according to ECSS–M–10.

Interfaces shall be controlled using Interface specifications and/or Interface Control Documents/Drawings.

Interfaces shall be controlled according to the different types below:

- interfaces external to the system,

- interfaces between system components,
- interfaces among Configuration Items.

Interface requirements shall be included, directly or indirectly, in the product TS and managed in the same way as this TS.

EXPECTED OUTPUT: *Interface Control Documents/Drawings.*

5.1.12

Configuration documents (including changes) shall be released according to ECSS–M–50 requirements.

AIM: Ensure that only released configuration documents are used.

EXPECTED OUTPUT: *Only released configuration documents in use.*

5.2   Configuration Control

5.2.1

A product's configuration baseline shall be identified by approved documents.

The establishment of a configuration baseline determines the point of departure for formal evolution procedure for products and configuration documents.

EXPECTED OUTPUT: *Documented configuration baseline.*

5.2.2

Document changes are subject to the same authorisation and circulation conditions as the initial documents.

AIM: Ensure that the information is modified only when all the requirements have been met and the modification communicated to the actors involved.

EXPECTED OUTPUT: *Document changes approved or agreed.*

5.2.3

Formal actions shall be defined for the approval of configuration baselines.

Approval of configuration baselines is obtained through the reviews described in ECSS–M–30.

At the end of a review, the configuration documentation is updated with approved recommendations (as per ECSS–M–30–01).

For each hardware product, the approval of configuration baselines shall be obtained as follows:

- for the Development Configuration, after the Preliminary Design Review on approval of the TS and DJF,
- for the Production Configuration, after the CDR by approval of the Production Master File and ICD and confirmed at QR by approval of user's manuals, Log Books and EIDP of the qualification models.

For software products, the approval of the configuration baseline shall be obtained:

- at the end of Software Requirements Review,
- at the end of the Critical Design Reviews,
- at the Test Readiness Review and Post Test Review.

EXPECTED OUTPUT: *Approval procedure available at reviews.*

5.2.4

A change procedure shall be established to document any evolution of a configuration baseline.

EXPECTED OUTPUT: *Change procedure.*

5.2.5

Any evolution of a Configuration Item, in relation to an approved configuration baseline, shall be described, justified and classified by the requesting party, then submitted to the actor's organisation responsible for review and approval.

AIM: Ensure that each evolution will be examined and its consequences known by all the actors concerned.

Only evolution in relation to an approved configuration baseline will be processed according to the change procedure.

They shall be presented and justified by the originating actor.

They shall be analysed by the actor's organisation responsible for review and/or approval.

The decision shall derive from a dedicated formal review process.

Interrelated evolution of several products resulting from a common need for change shall be processed and granted simultaneously.

Evolution of a 'common element' shall be presented to all the concerned actors for analysis and impact assessment.

EXPECTED OUTPUT: *Documented and approved evolution of a configuration item.*

5.2.6

Proposed changes shall be classified by the originator, according to the rules of the business agreement.

AIM: The classification of proposed changes determines the level authorised to take the approval decision.

Two classes of changes are to be distinguished:

- Class 1 concerns any change that affects approved technical specifications (including interfaces of the same level) or the terms of the business agreement between a customer and his supplier. A class 1 modification needs the customer's approval before its implementation.

- Class 2 concerns any change that does not fulfil class 1 criteria. A class 2 change is approved by the supplier, but each class 2 change shall always be transmitted to the next level customer for information and possible new classification.

According to the effects of its impact, a change proposal rises through the different levels of the organisation, until it reaches the level appropriate to decide its application, that is, the level for which the effects of the evolution have no repercussions on the commitments made to the customer. The evolution is, however, transmitted to the next level customer for information.

EXPECTED OUTPUT: *Classification of changes.*

5.2.7

Any evolution of a Configuration Item in relation to a configuration baseline shall be subject, after examination, to an evaluation and decision taken by the assigned control authority and in a formal process to which the actors involved have to contribute.

AIM: Ensure that any evolution will be applied in full consideration of all the actors concerned.

An evolution can be:

- requested by the customer (evolution of requirements). This request implies a reply from the supplier in a time limit to be defined in the business agreement. Changed requirements can only be applicable after examination and approval of the supplier's reply by a formal change proposal.
- proposed by the supplier (self-initiated improvement of design). In this case, approval authority may reside with the first level customer.

Decisions are:

- either approval. This shall define the applicability of evolution and associated application modes,
- or rejection. This shall state briefly the reasons for rejection,
- or deferral until additional information is provided.

EXPECTED OUTPUT: *Assessed and documented impact of the evolution.*

5.2.8

Any evolution of a Configuration Item's baseline shall be reported in accordance with business agreement requirements. Such evolution to the configuration baseline shall have formal back-up.

AIM: Formalise product evolution and make them traceable.

For an evolution requested by the customer, the corresponding change proposal shall include:

- the description of the change to the requirement documents, derived from the customer's request and as a result from the changes of requirements,
- the change description for the design including a risk assessment and a justification for the need of evolution.

For an evolution proposed by a supplier, the corresponding change proposal shall contain:

- the change descriptions related to the desired evolution of design,
- changes to the requirement documents, if any, to correspond to the changes to design,
- resulting changes to logistics documentation including modification data packages,
- description of any modification to business agreement provisions (e.g. cost, schedule, special clauses, data requirements, etc.).

EXPECTED OUTPUT: *Change proposal.*

5.2.9

The customer or supplier shall initiate all the changes including cost and schedule impacts, by the means of a formal procedure.

AIM: Clarify the status of the business agreement requirements.

EXPECTED OUTPUT: *Change Proposal disposition.*

5.2.10

Each project actor shall examine, in the time limits specified by the business agreement, any request or proposal for an evolution of a configuration baseline, which is presented to him by his customer or supplier.

AIM: Conduct a thorough change impact assessment under given schedule limits.

Each actor shall establish an internal procedure which permits the analysis and review disposition on proposed change.

This analysis shall focus on the impact (contractual, technical, quality, dependability and safety) on all the products for which the actor is responsible within the project.

EXPECTED OUTPUT: *Internal procedure for change impact assessment.*

5.2.11

In all the cases where a negotiated and agreed change proposal affects directly the conditions of the business agreement baseline, the new baseline shall be introduced into the business agreement by means of a rider.

AIM: Maintain the business agreement in line with the agreed baseline.

EXPECTED OUTPUT: *Update of the business agreement baseline.*

5.2.12

The supplier shall request permission for non-conformances to requirements and design in relation to baselined configuration identification documentation.

AIM: Any departure from baselined requirements and design have to be granted by the concerned level of customer.

For planned departures from requirements or design, the supplier shall submit a request for deviation which shall describe the extent to which the concerned product will not fulfil the baselined configuration identification documentation.

For unplanned departures from design through manufacturing or software coding errors, which are usually detected by product assurance through nonconformance reports, the supplier shall conduct an appropriately established material review board or software review board. When such board has made disposition for 'use as is' or 'repair'/'patchcode', the supplier shall submit a request for waiver which shall describe the departure from design in the same fashion as described above with the exception that the non-conforming product has already been produced and await permission for use as described in the waiver.

EXPECTED OUTPUT: *Request for deviation or waiver.*

5.2.13

The control of physical and functional interfaces shall be implemented at every level of the organisation and integrated into project activities.

Each supplier shall identify and control the internal interface of its products and provide the needed data for external interface control.

Procedures shall exist in the project for drawing up and formal agreement of interface documentation.

EXPECTED OUTPUT: *Interface Control Documents.*

5.2.14

The interface evolution shall be processed according to a formal change procedure.

The change proposals of all the products affected by an interface evolution shall be processed simultaneously and presented to all the actors concerned with respect to evolution control requirements.

EXPECTED OUTPUT: *Formal change procedure for interface evolution.*

5.3   Configuration Status Accounting

5.3.1

Configuration status accounting shall be organised in such a way as to be processable by a system enabling the recording and usage of configuration data.

AIM: The overall consistency required at project and component level makes knowledge and follow-up of data relative to items configuration necessary at every level.

Each actor shall implement a system that allows the recording of the configuration data for his products and the full traceability of their evolution. This system shall allow information to flow rapidly without being altered.

This system shall enable each supplier to know:

- the status of Configuration Items,
- the status of configuration documentation,
- the status of approval of change proposals and their status of implementation into products and documents,
- the status of waivers,
- the status of actions derived from technical reviews and configuration verification reviews.

The system implemented by each actor shall be described.

EXPECTED OUTPUT: *Documented status accounting system.*

5.3.2

Each supplier shall deliver to his customer status reports of the configuration of the products for which he is responsible.

The Configuration Management recording system shall provide:

- by product, the status of baselined documents and a list of the approved evolution,
- for each individual model, the status of applicable and applied change proposals,
- a configuration status indicating for each individual model:
  - applicable documents,
  - the status of implementation of approved evolution,
  - the applicable engineering waivers and their status.

EXPECTED OUTPUT: *Configuration status reports,*
Software Configuration file.

5.4 Configuration Verification

5.4.1

Project reviews shall conclude with the establishment of Configuration Baselines as defined in sub-clause 4.5.

Project reviews and their aims are defined in ECSS–M–30; details on how they are organised and conducted are provided in ECSS–M–30–01.

For Configuration Management, they are used to review the product configuration and to establish and approve a configuration baseline.

At the end of each review, the documents that identify the current configuration baseline are brought up-to-date with the recommendations made, then presented to the customer for approval.

EXPECTED OUTPUT: *Configuration baselines.*

5.4.2

Audits to verify the application of Configuration Management requirements shall be conducted in the life cycle of the product.

Each customer shall conduct internal and external audits, relative to configuration management activities. The planning and reporting of these audits shall be communicated to his customer, who may reserve the right to participate in such audits.

EXPECTED OUTPUT: *Audit reports.*
Definition and implementation of recovery actions.

5.5 Application Methods: Implementation Document for Configuration Management

5.5.1

Each actor shall prepare an Implementation Document for Configuration Management and submit it to his customer for approval.

The ECSS–M–30 standard defines the Project phase during which the Implementation Document for Configuration Management shall be prepared and approved.

Each actor's Implementation Document (as per ECSS–M–40–01) shall describe the organisation, methods, means and procedure implemented to manage the configuration of his supplies in accordance with the Project Requirements Document for Configuration Management.

At every level of the organisation, each customer is responsible for the acceptance of his suppliers' Implementation Documents.

The contents of the project Implementation Documents shall cover all configuration management tasks and activities without redundancy but not lacking defined interfaces between actors.

The Implementation Document shall include a compliance matrix to the requirements of the Project Requirements Document for Configuration Management.

Internal procedures implemented to ensure configuration management as set out in the Implementation Document shall be presented as required at the supplier's premises according to the access rules defined in ECSS–M–50.

EXPECTED OUTPUT: *Implementation Document for Configuration Management.*