ECSS-S-00A

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EUROPEAN COOPERATION

ECSS

FOR SPACE STANDARDIZATION

ECSS System

Description and implementation

ECSS Secretariat
ESA-ESTEC
Requirements & Standards Division
Noordwijk, The Netherlands

Foreword

This ECSS document gives a general introduction into ECSS and the use of ECSS Standards in space programmes and projects. 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.

The document has been prepared by a task force of the ECSS Executive, reviewed by the ECSS Panels and approved the ECSS Steering Board.

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Introduction

This document, ECSS–S–00, is the ECSS top-level document for ECSS users. Its function is to provide them with an overview of the ECSS System, together with an introduction to the three domains of applicability and to the disciplines covered by the set of ECSS Standards and the processes involved in generating and using these standards.

Standardization is an important tool for reducing cost and improving both quality and communication during the preparation and execution of programmes. Space agencies in Europe and the main suppliers have in the past individually developed standards and applied them to their projects. The European Cooperation for Space Standardization (ECSS) was initiated to harmonize existing European Standards for space projects, and to provide a single, coherent set of standards for use in all European space projects.

The objective of the ECSS Standardization System is to minimize life cycle cost, while continually improving the quality, functional integrity and compatibility of all elements of a project, by applying common standards for hardware, software, information and activities in projects.

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Scope

This document serves as a reference for the application of ECSS Standards to all categories of space projects by providing a description of the ECSS System and the method of implementation.

The implementation of ECSS Standards relies upon the fact that they are tailorable to different project requirements and apply to all phases and activities from the beginning to the end of a project, including mission analysis and disposal.

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Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revisions of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

ECSS-P-001   Glossary of terms

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Terms, definitions and abbreviated terms

3.1   Terms and definitions

Terms and definitions are contained in ECSS–P–001.

3.2   Abbreviated terms

The following abbreviated terms are defined and used within this Standard:

Abbreviation	Meaning
ASD-STAN	Aerospace and Defence Industries of Europe Standard (former AECMA-STAN)
CCSDS	Consultative Committee for Space Data Systems
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
DRD	document requirements definition
EN	European Standard
ETSI	European Telecommunications Standards Institute
IAQG	International Aerospace Quality Group
ID	implementation document
ESCC	European Space Components Coordination
ISO	International Organization for Standardization
PRD	project requirements document
SDO	standards development organization

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ECSS objectives and policy

4.1 Objectives

The overall objectives of using the ECSS Standards are to:

- achieve more cost effective space programmes and projects in Europe,
- improve the competitiveness of European Space Industry,
- improve the quality and safety of space projects and products, and
- facilitate clear and unambiguous communication between all parties involved, in a form suitable for reference or quotation in legally binding documents.

4.2 Policy

In order to meet the above stated objectives, the ECSS policy is designed to:

- improve industrial efficiency and competitiveness through using an integrated set of management, engineering and product assurance standards which can be tailored to the technical, cost, schedule, programmatic and economic characteristics of the space programmes and projects,
- promote continual improvement of methods and techniques in order to optimize the use of resources,
- promote implementation of an overall systematic programme and project risk management approach,
- ensure that space systems do not cause, during their complete life cycle, a hazard to human life, the environment, public and private property, major space and ground investments,
- make the best use of all available research, including the technology programmes of European space agencies,
- define principles for product and procurement system standardization,
- systematically feed back the experience from past programmes, projects and other appropriate sources into the ECSS System, and
- avoid duplication of existing standards through collaboration with the appropriate standards development organizations (SDOs).

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Introduction into space programmes

5.1 General

ECSS Standards are product oriented. Space products (e.g. launchers, spacecraft and associated ground support installations from system down to the smallest part) are designed, developed, procured, delivered, operated and maintained within specific projects and programme arrangements.

ECSS Standards are applicable with the same rules for all actors.

5.2 Customer-supplier concept

The production of complex space systems calls for the cooperation of several organizations that share the common objective of providing a product that satisfies the customer's needs (performance within cost and schedule constraints).

All space project actors are either a customer or a supplier, or both.

In its simplest form, a project can comprise one customer with just one supplier; however, typically space projects comprise a number of hierarchical levels, where:

- the actor at the top level of the hierarchy is the top level customer,
- the actors at intermediate levels of the hierarchy are both supplier and customer,
- the actors at the lowest level of the hierarchy are suppliers only.

The above hierarchical structure constitutes the customer-supplier chain of a project (see Figure 1).

Within the project, exchanges of products and services are governed by business agreements, used as a generic term throughout the ECSS Standards when referring to a legally binding agreement between two or more actors in the customer-supplier chain. These agreements include the terms and conditions agreed between the parties, typically the rules by which business is conducted, the actors' commitments and obligations for the provision of goods and services, the methods of acceptance and compensation, monetary, or otherwise. Business agreements serve as a framework prescribing the activities throughout the execution of work, and as a reference to verify compliance.

Business agreements are recorded in a variety of forms, such as

- Contracts,
- Memoranda of understanding,
- Inter-governmental agreements,
- Inter-agency agreements,
- Partnerships,
- Bartering agreements, and
- Purchase orders.

The ECSS Standards by themselves do not have legal standing and they do not constitute business agreements: they are made applicable by invoking them in business agreements, most commonly in contracts. Once they are called up in a business agreement, the relevant actors are obliged to comply with the standards, to the extent they are specified in the project requirements documents (PRDs). The project requirements documents are binding, as they form part of the business agreement.

The top-level customer's PRD forms the basis for the generation of all lower level customer PRDs. An integral part of a PRD, at any level, is the set of requirements derived from the tailoring of ECSS Standards and documented in an "applicable requirement matrix", as described in subclause 7.3.5.

A supplier, at any level, is responsible for demonstrating compliance with the project requirements contained in his customer's PRD, through the elaboration of one or more implementation documents, and ultimately for supplying a conforming product.
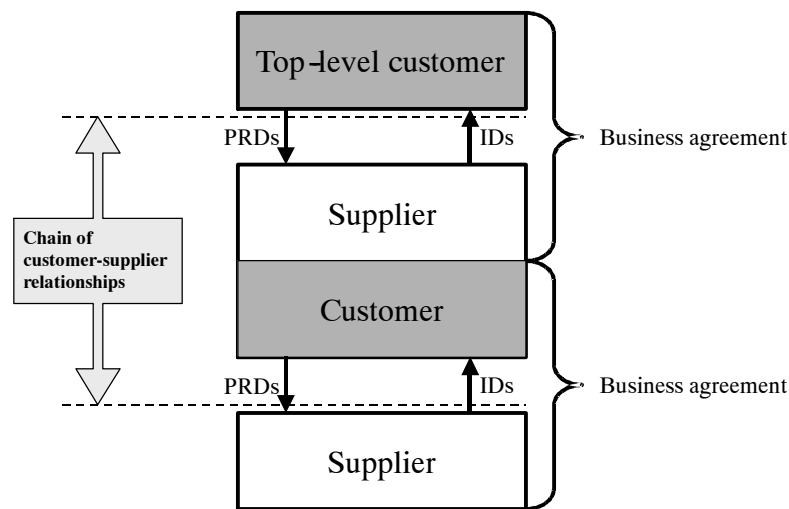
Figure 1: Customer-supplier network concept

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ECSS System description

6.1 Overview

The ECSS System has been developed as a cooperative effort between the European space agencies and space industries. It comprises a comprehensive set of standards addressing all essential aspects of the three major domains for the successful implementation of space programmes and projects, namely

- Project management,
- Engineering, and
- Product assurance.

The ECSS System of standards is an integrated system and is unique in space standardization as it is structured such that standards in each of the three ECSS domains interact with, and to varying degrees are dependent upon, standards in the other domains to create a complete and coherent set of standards for users. This approach ensures that users of the ECSS System are provided with the appropriate tool for efficient and cost effective implementation of space programmes and projects from concept definition through completion of the operational phase.

ECSS Standards are consistent with the ISO definition of a standard, but are focused specifically for direct use in invitations to tender and business agreements for implementing space projects. Their content is limited to:

- Verifiable requirements, supported by the minimum descriptive text necessary to understand their context.
- Recommendations conveying that, among several possible solutions, one is identified as particularly suitable, but does not exclude other suitable alternative solutions.

The standards that together make up the ECSS System are space product oriented, making them relevant to individual space projects or to space programmes that comprise a collection of closely related, or directly interfacing, projects managed under a single unified management structure in order to realize the benefits of improved programmatic and technical efficiencies.

6.2 Key characteristics of the ECSS System

The ECSS System has four prominent characteristics, which are to provide:

- a comprehensive and coherent set of standards offering a complete and stable framework within which customers and suppliers at all levels can implement a project in an efficient and cost effective manner;

- a system of standards constructed in such a way that it can be applied throughout the life cycle of space projects and programmes;

- a system that can be utilized in activities ranging from small, individual, less complex projects to very large programmes comprising several projects involving many products and interfaces;

- a controlled method for tailoring the standards such that they can be applied selectively depending on the type, or phase of the project for which they are being used.

As a consequence, the ECSS System focuses primarily on what is required to comply with each standard, rather than how to achieve this. This approach provides the flexibility for different customers and suppliers to use established "in-house" procedures, or processes, to comply with these standards. The ECSS System also includes supporting standards, which identify specific procedures or processes, and Handbooks, which provide technical data and guidelines for procedures and processes. Handbooks are documents providing orientation, advice or recommendations on non-normative matters.

6.3 ECSS communities

The overall ECSS System comprises two communities: ECSS developers, and ECSS users.

The "ECSS developers" are responsible for generating, publishing and maintaining ECSS Standards for use in space projects. The set of published ECSS Standards and Handbooks is arranged in a specific architecture and with a structured identification numbering system.

The ECSS users are responsible for the application of ECSS Standards to projects, including any adaptation through tailoring necessary to meet specific projects' needs. They are also expected to provide feedback to the ECSS developers for the maintenance, updating and enhancement of the ECSS System.

6.4 Structure and architecture of ECSS Standards System

The top level user document of ECSS is this current document. Beneath this document (Figure 2) there are three parallel domains, one each for project management, engineering, and product assurance. Project management branch standards have an "M" prefix, engineering standards have an "E" prefix, and product assurance standards have a "Q" prefix. The standards in each branch are divided into three levels.

- In each branch a top level standard (ECSS-M-00, ECSS-E-00, and ECSS-Q-00) provides an overview and brief description of the various disciplines covered by the branch it heads, together with a "roadmap" and pointers to other standards within the branch or, where relevant, to standards in other branches. These standards are mainly descriptive in nature, but can also contain overall requirements for the branch they head.

- Within each branch, the main disciplines and corresponding requirements are covered by dedicated standards, which are identified by a double digit following the branch prefix letter (e.g. ECSS-M-20, ECSS-E-20, ECSS-Q-20).

- Discipline related standards are supported by specific procedures and process related documents, which are identified by an additional double digit (e.g. ECSS-M-30-01).

The project disciplines addressed by the ECSS are

- Project management
  - project breakdown structures,
  - project organization,
  - project phasing and planning,
  - configuration management,
  - information/documentation management,
  - cost and schedule management, and
  - integrated logistics support.
- Product assurance
  - quality assurance,
  - dependability,
  - safety,
  - EEE components,
  - materials, mechanical parts and processes, and
  - software product assurance.
- Engineering
  - system engineering,
  - electrical and electronic,
  - mechanical,
  - software engineering,
  - communications,
  - control engineering, and
  - ground systems and operations.

Each standard within the ECSS System includes descriptive text identifying the context and purpose of the standard, together with the specific requirements to be adhered to. Each requirement contained within an ECSS Standard has a unique identification, allowing

- full traceability when selecting complete standards, or requirements within a standard for applicability during the tendering phase of a project, and
- an easy implementation of a compliance matrix for verification.

In order to ensure that each requirement statement is clear and concise, the scope and content of the expected response is very often defined in a dedicated DRD (document requirements definition), which forms an integral part of the standard. DRDs are strictly limited to defining the data in response to a particular requirement and do not contain implied additional project management, engineering, or product assurance requirements.

In addition to the ECSS Standards addressed above, the primary purpose of which is to define requirements derived from the definitions and descriptive text included in the Standard, the ECSS System also includes Handbooks and Technical Memoranda. These do not contain requirements, but provide additional useful information on selected topics addressed by the ECSS Standards, which can be used as reference material by customers and suppliers at all levels.

ECSS Handbooks typically provide a knowledge base on specific topics within a main discipline and contain information on such aspects as best practices, specific techniques, typical applications for various techniques and processes, and descriptions of physical and chemical characteristics. They are identified by the letters HB followed by a triple digit number and a unique title (eg. ECSS–HB–001 – Welding).

ECSS Technical Memoranda are similar to Handbooks, but usually address a specialized topic and typically focus on a specific implementation in some depth. They are identified by the letters TM, followed by a triple digit number and a unique title (e.g. ECSS-TM-001 – Implementation of Fibre Optic data buses on XSat).
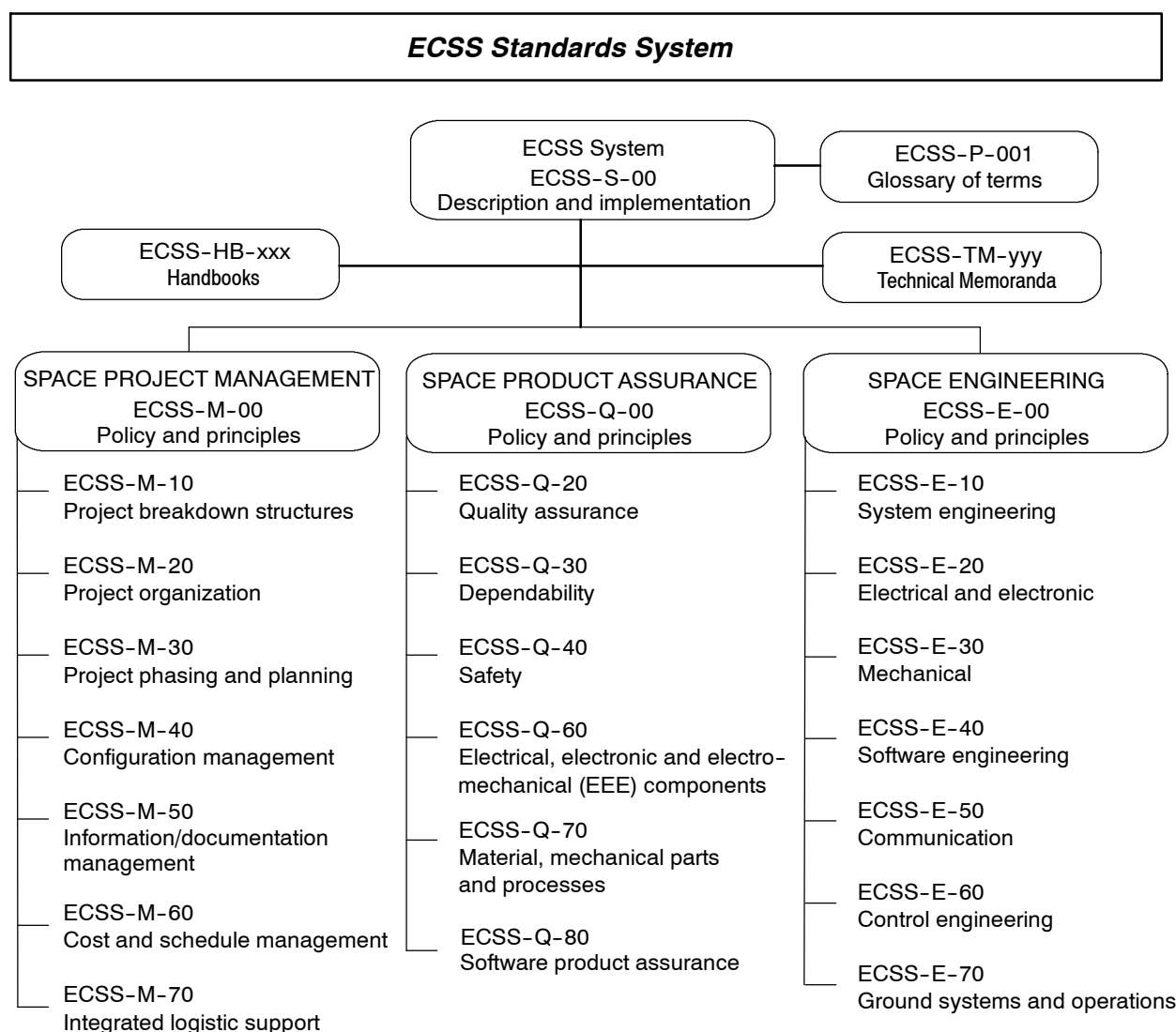

ECSS Standards System

ECSS System
ECSS–S–00
Description and implementation

ECSS–P–001
Glossary of terms

ECSS–HB–xxx
Handbooks

ECSS–TM–yyy
Technical Memoranda

SPACE PROJECT MANAGEMENT
ECSS–M–00
Policy and principles

- ECSS–M–10
Project breakdown structures
- ECSS–M–20
Project organization
- ECSS–M–30
Project phasing and planning
- ECSS–M–40
Configuration management
- ECSS–M–50
Information/documentation management
- ECSS–M–60
Cost and schedule management
- ECSS–M–70
Integrated logistic support

SPACE PRODUCT ASSURANCE
ECSS–Q–00
Policy and principles

- ECSS–Q–20
Quality assurance
- ECSS–Q–30
Dependability
- ECSS–Q–40
Safety
- ECSS–Q–60
Electrical, electronic and electro-mechanical (EEE) components
- ECSS–Q–70
Material, mechanical parts and processes
- ECSS–Q–80
Software product assurance

SPACE ENGINEERING
ECSS–E–00
Policy and principles

- ECSS–E–10
System engineering
- ECSS–E–20
Electrical and electronic
- ECSS–E–30
Mechanical
- ECSS–E–40
Software engineering
- ECSS–E–50
Communication
- ECSS–E–60
Control engineering
- ECSS–E–70
Ground systems and operations

Figure 2: Structure of the ECSS Standards system

6.5   Generation of ECSS Standards

6.5.1   ECSS developer bodies

ECSS Standards are generated and processed by a number of bodies, which are governed by ECSS Procedures, within the "ECSS developers" community. These are

- ECSS Working Groups, which are responsible for drafting ECSS Standards;

- the ECSS Management, Engineering, and Product Assurance Panels, which are responsible for establishing and managing ECSS Working Groups within the ECSS domain for which they are responsible, and for ensuring consistency and coherence of the standards within their domain;

- the ECSS Executive, which is responsible for ensuring that standards forwarded by the Panels for Public Review or Steering Board approval are coherent across the three ECSS domains. The Executive is also responsible

for ECSS interfaces with other standards organizations, and for ECSS training and promotion;

- the ECSS Steering Board, which is responsible for overall ECSS policy, the provision of ECSS resources, and for final approval of ECSS Standards for publication;

- the ECSS Secretariat, which provides support to the "ECSS developers" community, and is responsible for publishing ECSS Standards as well as putting ECSS Standards forward to become EN Standards.

6.5.2 ECSS Standards development process

Each of the above bodies operates on a consensus basis and includes members from the cooperating agencies and European space industry.

ECSS Standards are developed by following the same basic process applied to the development of other international standards, such as ISO and EN standards.

The four key phases of this process are:

1. Drafting:
   The majority of ECSS Standards are drafted by ECSS Working Groups appointed by the responsible ECSS Panel. In some cases, where the expertise is already available at the Panel level, a standard may be drafted directly by a Panel;

2. Public Review:
   Once an ECSS Standard is drafted, it is endorsed by the relevant ECSS Panel and the Executive, and then released for Public Review.
   As for other International Standards, the primary objective of the Public Review is to obtain early feedback from the widest possible audience on the proposed scope and content of a standard. During the Public Review period, reviewers are encouraged to generate Document Review Reports (DRRs), and to submit these to the ECSS Secretariat.

3. Disposition of Public Review responses:
   At the end of the Public Review, the ECSS Secretariat passes all received DRRs to the ECSS Panel and Working Group responsible for the development of the draft standard for their disposition. All DRR dispositions are entered into the DRR record and the originator notified, including as applicable, the reason for rejection. All agreed changes are incorporated into the draft standard.

4. Final Approval:
   The updated draft standard is forwarded to the ECSS Executive for endorsement and subsequently to the Steering Board for approval, after which it is published as an ECSS Standard.

6.6 Maintaining ECSS Standards

In line with other international standards, ECSS developers assess each ECSS Standard for possible updating and improvement no later than 5 years after its publication. Two of the most important factors used to judge the need, or otherwise, for improvement of an ECSS Standard are the assessment of tailoring feedback and the number and importance of the Change Requests received.

Application of the tailoring process provides essential feedback (see clause 8) to the ECSS developers and is used as an important tool for updating and improving existing ECSS Standards.

In addition to the user feedback, automatically available through the tailoring process, users are also encouraged to raise Change Requests proposing modification or deletion of existing requirements, or the addition of new requirements. Change Requests can also be used to propose the use of new technologies or techniques that have come into general use since the ECSS Standard in question was last published.

A decision to update an ECSS Standard at the 5-year review point can lead to a complete re-issue of the standard involving all of the steps identified under subclause 6.5 above (Generation of ECSS Standards).

6.7 Relationship between ECSS Standards and European or International Standards

6.7.1 General

The ECSS developer authorities closely monitor the evolution and ongoing activities of other European Standards Organizations, in particular CEN, CENELEC and ETSI as well as the International Organization for Standardization (ISO), and maintain regular contacts with these organizations, as well as with the European Union. The primary purpose of this monitoring is to avoid unnecessary duplication of standards.

Where an already approved and published European (EN) or International Standard (ISO or CCSDS) exists that can be used by the ECSS System to fulfil an ECSS objective, this standard is directly called up and made applicable by the ECSS System to avoid unnecessary duplication.

Once an ECSS Standard is approved by the ECSS authorities and published for use, the standard may, on a case by case basis, be submitted to CEN, CENELEC or ETSI for approval and release as a European Standard with an EN identification number.

If standards are proposed by ISO members which are similar to existing ECSS Standards, the ECSS will propose a transfer of appropriate ECSS Standard to ISO via its members or the ISO/ECSS cooperation group to avoid the duplication of standards.

For any ECSS Standard that becomes an EN Standard, the ECSS developers retain full control and responsibility for the content and updating of the standard.

The ECSS authorities may also decide to submit an approved and published ECSS Standard to ISO for use as an international standard. In this case, approval and publication of the standard by ISO significantly increases the potential user base, and through this, the competitiveness of European space industries in the international market.

User responses to an EN or ISO standard that indicates an ECSS Standard as the source document are encouraged to continue to address tailoring feedback, or change requests to the ECSS developers who regularly assess these inputs.

6.7.2 Transfer into CEN

The mechanism for transferring ECSS Standards to CEN is as follows:

- In accordance with a protocol between the ECSS and CEN, a selection of ECSS Standards are transferred to CEN.
- The CEN rules require for each CEN draft standard an enquiry process, i.e. a Primary Questionnaire (PQ) process, whereby national bodies can submit editorial and technical comments, and a formal approval process, where, with the vote, only editorial comments are accepted.
- Under the agreement by CEN, the process is generally shortened to the Unique Acceptance Procedure (UAP), if a standard is ready for publication under ECSS and the enquiry process had been performed by ECSS.
- CEN technical comments, incorrectly posted after CEN formal voting or the UAP, are collected as improvement proposals for a next revision to the standard, but they are not incorporated into the current version.
- If an ECSS Standard was published in CEN, no revision to the standard is initiated by CEN alone, but it is handled by the ECSS in a similar way to a CEN Technical Committee. As a result, the ECSS retains control over any EN Standard originating from the ECSS.

6.7.3 Other standards development organizations (SDOs)

ECSS collaborates with the following SDOs and entities:

- ESCC,
- IAQG,
- ISO,
- CCSDS, and
- ASD-STAN.

The collaboration of ECSS with the above mentioned SDOs covers assessment of the work plan, and the identification of possible cooperation areas, which are described in the ECSS policy of SDOs.

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7

Application of ECSS Standards

7.1 Introduction

ECSS Standards are made applicable to a project through a business agreement in which a customer defines the work to be performed by his supplier(s), together with the programmatic and technical requirements to be adhered to during the execution of the project, and against which the resultant products or services are accepted. The ECSS Standards and requirements to be made applicable at each level of the customer-supplier chain are significantly influenced by the type and phase of the project involved, and by the type of business agreement to be used for managing the project.

As the total ECSS System provides a comprehensive set of coherent standards for application across a wide range of project types, it is important to complete two important preparatory activities before addressing the range, degree and phasing of applicability of the total set of ECSS Standards to a particular project.

Figure 3 and the following subclauses describe a **7-step process** for the preparation and application of tailoring to establish the applicability of ECSS Standards and their requirements to a project.

7.2 Preparatory activities

7.2.1 Identification of project characteristics - ①

Overall project characteristics are derived mainly through experience gained and lessons learned from comparable projects, and are used for establishing the project context, scope, scale, orientation and other key elements important to the successful achievement of the project objectives. They are specified in both programmatic and technical terms. Programmatic characteristics cover overall risk policy, including risk sharing, as well as political, financial, schedule, economic and contractual aspects. Technical characteristics cover mission objectives, technical complexity, technology, engineering, quality, scientific and product-oriented aspects.

7.2.2 Analysis of project characteristics and identification of risks - ②

After identifying its characteristics, the project is analysed to identify significant cost, schedule and technical drivers, as well as critical issues and specific constraints. These are used to identify and evaluate inherent and induced risks.

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The resulting project risk factors are documented and the causes and consequences of the identified risks are determined. This is the first step in the risk management process, which is continued to monitor and manage risk mitigation actions throughout the life of the project.

7.3 Tailoring activities

7.3.1 Selection of applicable ECSS Standards - ③

Using the results of the preparatory activities as the primary input, the complete set of ECSS Standards is evaluated for relevance to the overall project needs. Those standards found to be relevant are identified as applicable standards for the implementation of the project. In making this determination, it is important to recognise that at this level, due to the integrated structure of the ECSS System, identifying a standard as directly applicable also makes other standards called by it explicitly applicable to the extent defined within the directly applicable standard.

The set of applicable standards selected through the above process can range from the complete set of ECSS Standards, down to a subset of ECSS Standards, depending mainly on the type, size and complexity of the project being addressed. The project phase, or phases, for which the applicability of ECSS Standards and their requirements is being selected, is another important factor to be considered. The early phases in a project lifecycle typically do not need a high percentage of the requirements available in ECSS Standards to be made applicable to achieve their objective. However, in order to establish an overall view of the phasing in of requirements, it is good practice that this initial selection of applicable standards covers all project phases up to and including the development phase, which is typically the most demanding phase of a project. With this initial selection established, appropriate and coherent subsets of the standards to be made applicable during the course of project implementation can then be selected to match the specific needs of the earlier project phases.

7.3.2 Selection of applicable ECSS requirements - ④

Having established the list of applicable ECSS Standards for a project, the extent to which the requirements contained within these standards are made applicable is assessed against cost, schedule, and technical drivers, as well as against the identified risks and their mitigation strategies.

Each requirement within the applicable standards is assessed and classified as:

    (A) Applicable without change,

    (M) Applicable with modification, or

    (D) Not applicable (deleted).

Where all requirements in a standard are classified as applicable without change, the whole standard is fully applicable.

Where an applicable standard contains requirements of different classifications, these are recorded as follows:

- for each requirement classified as (A), the applicability is recorded as such;
- for each requirement classified as (M), the modification can be a change to, or deletion of, part of the existing text, or new text added to the existing text to enhance or clarify the requirement. In all cases, the complete modified text is recorded;
- for each requirement classified as (D), the non-applicability is recorded as such.

Where any requirement in an applicable standard is classified as (M), or (D), the standard is partially applicable.

7.3.3　　Addition of new requirements - ⑤

Where the applicable ECSS Standards do not include a specific requirement needed for the project, a new requirement is generated or adopted from an international standard. Such requirements are classified as:

> (N) New.

For each requirement classified as (N), the complete new text is recorded.

It is important to support the addition of new requirements by a justification.

7.3.4　　Harmonization of applicable requirements - ⑥

Having completed the selection of applicable ECSS Standards and requirements and the addition of any new requirements in accordance with the above process, the coherence and consistency of the overall set of requirements to be applied to the project is reviewed to eliminate the risk of conflict, duplication, or lack of necessary requirements.
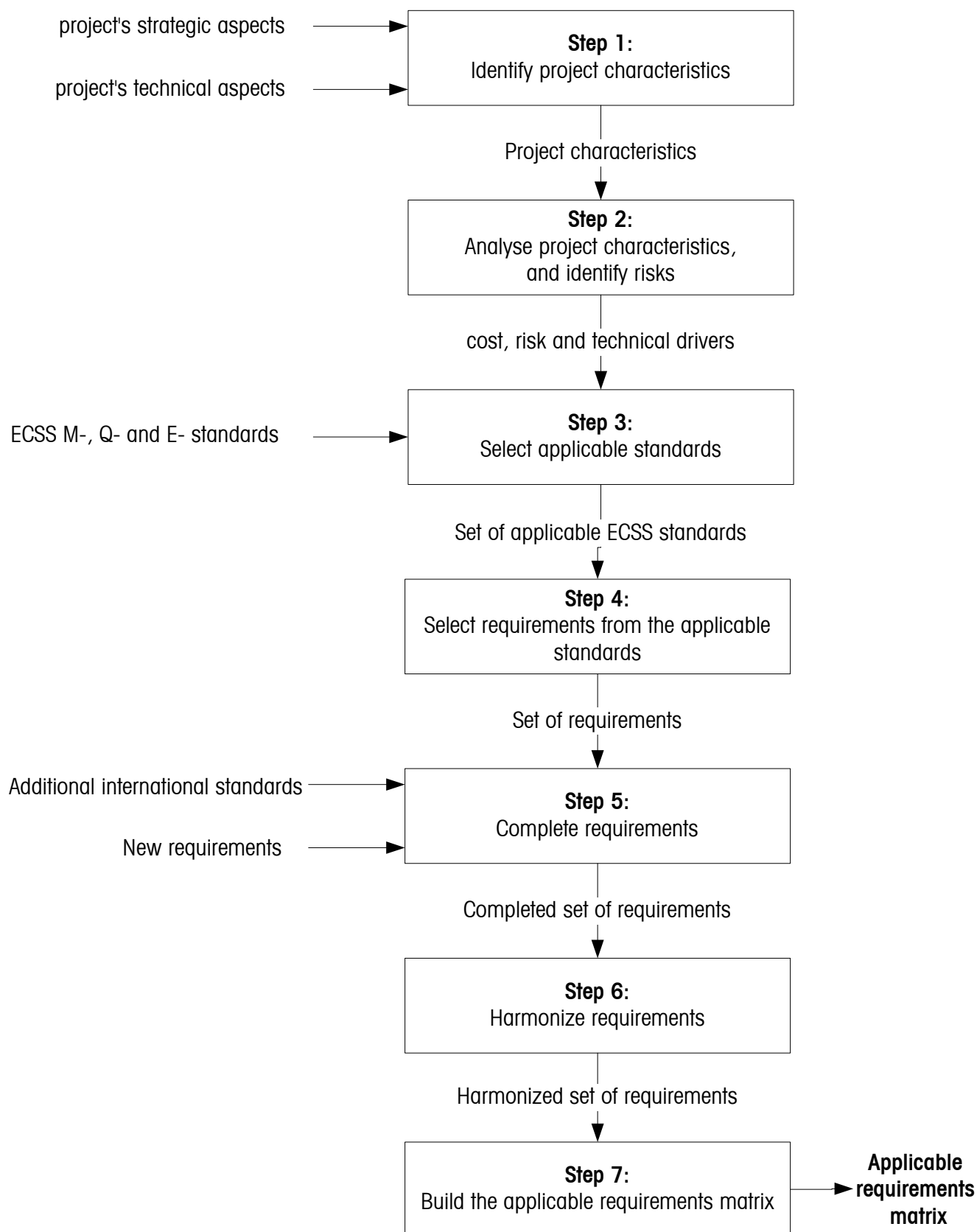
7.3.5　　Documenting ECSS Standards and requirements applicability - ⑦

The process summarized above for selecting the applicability of ECSS Standards and requirements for a project intentionally does not define a specific format for generating and recording the results of the process. This approach is in line with the ECSS principle of identifying what is required, but not how this is to be achieved, and provides a degree of freedom for customers to select the most appropriate way to present the data within their particular environment.

However, the record of the process normally contains the following data:

a.　a complete list of all ECSS Standards either fully or partially applicable;

b.　a complete list of all Standards made applicable via a normative reference in an ECSS Standard in list under a.;

c.　a complete list of all requirements in partially applicable ECSS Standards that are either applicable with modifications, or not applicable, together with the full new text in the case of all requirements applicable with modifications;

d.　the complete text of any new requirements, together with a cross-reference to where they are inserted within the overall applicable requirements.

One method of recording the applicability data in an efficient and structured manner is to consolidate it into an "**applicable requirements matrix**". The feedback of these data to the developers of ECSS Standards is an essential element for continuous improvement of the ECSS System.

ECSS

project's strategic aspects ⟶ **Step 1:** Identify project characteristics

project's technical aspects ⟶

↓ Project characteristics

Step 2: Analyse project characteristics, and identify risks

↓ cost, risk and technical drivers

ECSS M-, Q- and E- standards ⟶ **Step 3:** Select applicable standards

↓ Set of applicable ECSS standards

Step 4: Select requirements from the applicable standards

↓ Set of requirements

Additional international standards ⟶ **Step 5:** Complete requirements

New requirements ⟶

↓ Completed set of requirements

Step 6: Harmonize requirements

↓ Harmonized set of requirements

Step 7: Build the applicable requirements matrix ⟶ **Applicable requirements matrix**

Figure 3: 7-step tailoring process

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User feedback

User feedback is the primary source used by ECSS developer for enhancing and keeping current the ECSS System and its standards in order to meet the need of projects better.

In addition to user feedback provided during the development of ECSS Standards, continuing feedback is expected as presented below:

1. Feedback during tendering phases

   The result of the tailoring process described in clause 7 is recorded in the tender documentation in some form of "Applicability Matrix". This matrix represents the first important user feedback because it provides information on how ECSS Standards were applied in generating the ITT.

2. Feedback during project implementation phases

   The approval of the business agreement constitutes the second source of feedback as it provides the actual application of standards and requirements, as finally negotiated and agreed between the customer and his supplier(s).

   During the course of the project, contract changes provide another potential opportunity for users to provide feedback.

3. Independent feedback

   At any time, users of ECSS Standards can propose changes or improvements to those standards, or to the ECSS System as a whole. Such proposals represent another source of feedback and can be generated by any actor in the form of an ECSS Change Request.

During the project tendering process and its implementation phases, all feedback data needed by the ECSS Developers is either generated by, or becomes available to the customer, who is the primary source for submitting this data to the ECSS Secretariat for recording and passing it onto the appropriate ECSS Panels and Working Groups for assessment and further processing.

For independent feedback, the Change Requests can be submitted to the ECSS Secretariat or uploaded to the ECSS website (www.ecss.nl). Subsequently, the Secretariat records and processes them as for feedback provided during project tendering or implementation phases.

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Bibliography

ECSS-P-00	ECSS — Standardization policy
ISO 9000:2000	Quality management systems – Fundamentals and vocabulary
PMI Institute	Project Management Institute — PMBOK Guide 2000 edition

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ECSS Change Request / Document Improvement Proposal

A Change Request / Document Improvement Proposal for an ECSS Standard may be submitted to the ECSS Secretariat at any time after the standard's publication using the form presented below.

This form can be downloaded in MS Word format from the ECSS Website (www.ecss.nl, in the menus: Standards – ECSS forms).

ECSS Change Request / Document Improvement Proposal

1. Originator's name: Organization: e-mail:			2. ECSS Document number: 3. Date:	
4. Number.	5. Location of deficiency clause (e.g. 3.1) / page (14)	6. Changes	7. Justification	8. Disposition

Filling instructions:

1. **Originator's name -** Insert the originator's name and address
2. **ECSS document number -** Insert the complete ECSS reference number (e.g. ECSS–M–00B)
3. **Date -** Insert current date
4. **Number -** Insert originator's numbering of CR/DIP (*optional*)
5. **Location -** Insert clause, table or figure number and page number where deficiency has been identified
6. **Changes -** Identify any improvement proposed, giving as much detail as possible
7. **Justification -** Describe the purpose, reasons and benefits of the proposed change
8. **Disposition -** not to be filled in (*entered by relevant ECSS Panel*)

Once completed, please send the CR/DIP by e-mail to: ecss-secretariat@esa.int

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