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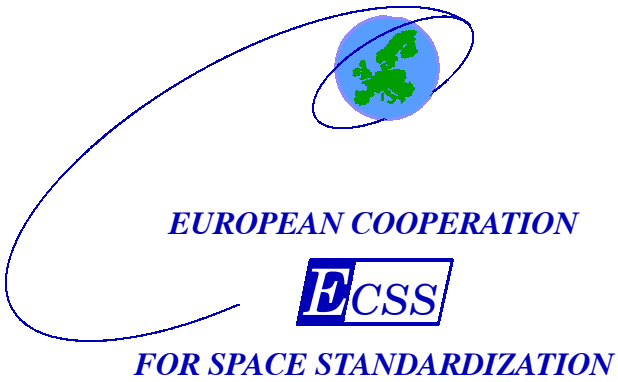

Space project management

Policy and principles

ECSS Secretariat
ESA-ESTEC
Requirements & Standards Division
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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. Annex A provides an overview of the architecture and structure of the series of ECSS Standards. 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 shall be accomplished, rather than in terms of how to organize and perform the necessary work. This allows existing organizational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standard.

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

Significant changes between this version and the previous version are:

- general streamlining of issue A table of contents and text of the document,
- text of bullet list of clause 1 reworded to reflect streamlining of table of contents and to highlight that the main objective of the standard is to define a Management Plan, and
- added DRD for the Management Plan.

This Standard has been prepared by the ECSS Management Panel, reviewed by the ECSS members and approved by the ECSS Steering Board.

This version B cancels and replaces ECSS-M-00A.

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Introduction

The production of complex products requires the cooperation of several organizations that share a common goal: to provide a product that satisfies the customer's needs (technical performance) within cost and schedule constraints.

To reach this goal, corresponding technical activities, and human and financial resources, have to be organized and coordinated in a structured manner in order to obtain the end product or system. This structure, together with related processes, constitutes a project. It implies a target (system), a time frame and actions to be performed under resource constraints.

Project management consists of the definition, implementation and execution of such actions including the verification that results obtained match the expected ones.

Project management requires careful thinking about what shall be accomplished, laying out all the steps needed to build that future, and obtaining the resources required to carry out those steps. But importantly it requires dealing with reality, problems, delays, changes, obstacles and, sometimes, opportunities that arise as a project takes place.

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Scope

This Standard is designed to facilitate the elaboration of a management system which is cost effective, appropriate to the project in which it is implemented, compatible with the actors' existing structures, and which has the flexibility to adapt to changes throughout all the phases of an evolving project and to new projects.

It contains the basic requirements and overall principles to be applied for the management of space projects, from definition of mission objectives to final disposal. It defines the scope and interfaces of this discipline with the activities relative to the domains of engineering and product assurance that are addressed in the engineering and product assurance branches of the ECSS Standards system, and explains how they are interrelated to ensure customer satisfaction. The set of related standards apply to all the actors for the execution of a space project.

In this Standard:

- Clause 4 presents the overall policies and principles to be applied in using ECSS Standards for the management of Space Projects and describes the processes to be followed at all levels of the customer-supplier network in applying and tailoring ECSS Standards for implementing the managerial and technical activities associated with the preparation and execution of Space Projects.
- Clause 5 defines the objectives of each of the major elements of Project Management, together with the policies and principles to be applied for each of these.
- Clause 6 specifies the rules to be followed by the customer in developing Project Management Requirements and defines the Project Management. Plan to be generated by the supplier in response to these requirements in accordance with the DRD presented in Annex B.

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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 normative document referred to applies.

ECSS-P-001	Glossary of terms
ECSS-M-00-02	Space project management — Tailoring of space standards
ECSS-M-00-03	Space project management — Risk management
ECSS-M-10	Space project management — Project breakdown structures
ECSS-M-20	Space project management — Project organization
ECSS-M-30	Space project management — Project phasing and planning
ECSS-M-40	Space project management — Configuration management
ECSS-M-50	Space project management — Information/documentation management
ECSS-M-60	Space project management — Cost and schedule management
ECSS-M-70	Space project management — Integrated logistic support
ECSS-E-00	Space engineering — Policy and principles
ECSS-Q-00	Space product assurance — Policy and principles

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Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this Standard, the definitions given in ECSS-P-001 apply.

3.2 Abbreviated terms

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

Abbreviation	Meaning
DRD	document requirements definition
ECSS	European Cooperation for Space Standardization
EEE	electrical, electronic, electromechanical
ID	implementation document
ITT	invitation to tender
PRD	project requirements document
WBS	work breakdown structure

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Use of ECSS Standards to define project requirements

4.1 Policy and principles

It is the ECSS policy that ECSS level 1 and level 2 standards define requirements in terms of what shall be achieved, interface requirements that shall be satisfied, and constraints that shall not be breached. Particular methods, implementation techniques or organizational arrangements are not imposed.

In addition, ECSS level 3 standards are intended to:

- avoid case-by-case definition of those aspects that are not project-specific;
- permit rapid, standardized response from the supplier;
- facilitate re-use of equipment and associated documentation.

The ECSS Standards are not mandatory documents in the legal sense. Consequently, these standards are made applicable on a project by the customer invoking them in the binding documentation in accordance with the relevant business agreement.

It is the ECSS policy that:

- The customer defines the project requirements, including constraints, interfaces and, in exceptional circumstances, the essential methods and techniques to be applied.
- The supplier has the freedom to select methods by which they intend to fulfil the project requirements, constraints, interfaces, and propose alternative methods and techniques equivalent to those exceptionally defined by the customer. The supplier has the responsibility to demonstrate that the selected method satisfies the customer's requirements.

In order to fulfil the objectives, the level 1 and level 2 standards allow for the following functions:

a. to enable optimization of aspects of the customer-supplier relationship that is established among all the actors of a space project. Consequently, they have been drafted to facilitate:
   - the critical stages of the elaboration process of the business agreements and contract clauses binding the various participants. They cover the

preparation of an invitation to tender (ITT) by the customer, the elaboration of the industry proposal and the final negotiation preceding the contract award. During these three stages, the ECSS Standards enable the different actors (customer and supplier) to select the requirements set (and the replies to these requirements) tailored to the nature of the particular project;

- the project execution.

b. to ensure the harmonization in Europe of the requirements of various space projects. The availability of the ECSS Standards system as a common source of requirements (applicable to all the actors of a space project, in every stage of the elaboration process of the customer-supplier relations) is the only way to reduce the proliferation of similar requirements, differently expressed from one project to another.

The aim to increase the competitiveness of space products can only be achieved if one maintains strict discipline for the cascade of requirements from the first level customer to the lower levels of the project's industrial organization. At each level the customer applies to his supplier only those requirements strictly necessary at the level of the relevant product or activity.

4.2 Tendering process

The tendering process is how the customer selects a supplier for the supply of goods and services. Typically this establishes a contract between two parties. However, this process may be used to establish other business agreements, such as those for the supply of items from one governmental organization to another for mutual benefit. A variety of legal regulations, both national and international, apply to this process. As this can be competitive or non-competitive, the detailed procedures vary accordingly.

To start the tendering process, the customer, in its ITT to a potential supplier, defines the project requirements, targets, terms and conditions for the performance of the work, and required proposal contents, which collectively constitute the project requirements document. The tenderers respond by submitting proposals, addressing the technical, programmatic and other requirements in the ITT and providing the necessary plans to establish the baselines for the execution of the work. The customer then assesses the responses to its ITT, and determines what action to take, which may be to:

- select one of the proposals, or parts of different proposals (if indicated in the ITT), as the basis to proceed;
- assess one or more of the proposals further before making a decision, requesting additional information if necessary and where the tendering rules allow;
- reject all proposals.

After a proposal has been chosen as the basis to proceed, negotiations finalize the details of the business agreement between the parties, within the applicable tendering rules and without negating the original competitiveness.

4.3 Customer-supplier network

Exchanges of products and services within a project are governed by business agreements, which shall be understood in the wide sense.

A business agreement is a legally binding arrangement between a customer and a supplier.

Business agreements can be made up of terms and conditions, financial provisions, deliverables, delivery dates and project requirements documents (PRDs).

The terms “customer” and “supplier” are used generally in all the ECSS Standards. “Purchaser” and “contractor” are only to be used when the associated requirement applies to a contract in the narrow sense.

The top-level business agreement may lead to a customer-supplier network as shown in Figure 1, consisting of one or more levels covered by lower tier agreements where the supplier at level n plays the role of customer for the lower tier supplier at level n+1. The chain starts with the consumer situated at level 0 of the organization. The role and responsibilities of the various players follows the descriptions below as complemented by Table 1.

The **consumer** is responsible for expressing the needs and expectations of the project covered by the top-level business agreement. They are responsible for identifying/approving the financing of the project and identifying politico-economic and major project constraints.

The **first level customer** is also situated at level 0 of the organization. They can be the consumer or the consumer’s agent. The first level customer defines all the project requirements, [see Figure 1 for following references in italics – *activity* ①] either explicitly (in case of product requirements) or by reference to selected and tailored ECSS Standards [*activity* ②] in order to prepare a PRD [*step* B].

The **first level supplier** is situated at level 1 of the organization. The first level supplier is responsible for responding to the PRD [*activity* ③] and demonstrating compliance to the project requirements, through the elaboration of one or more implementation documents (IDs) [*step C*] and finally for supplying a conforming system.

The **next level supplier** (e.g. subcontractors, equipment manufacturers) is situated at the lower levels of the organization, identified by higher numbers: 2, 3, etc.

The **project general requirements** for the top-level business agreement cover functional requirements (what the product must do) and performance requirements (how well it must perform) at system level. The **project characteristics** [*step* A] determine objectives (e.g. system technical performance, required availability, delivery time, duration of operational life), constraints (e.g. environment of product utilization, budget available, environment impact), planning, project financing and organization leading ultimately to a set of **PRDs**.

The application principle for the PRD in the customer-supplier network is as follows: they are drawn up by the first level customer and are to be followed by all the levels of the industrial organization, with tailoring specified by each customer to the corresponding supplier [*activity* ⑤], leading to local PRDs [*step* D] and IDs [*activity* ⑥ and *step* E]. The tailoring process is addressed in subclause 4.4 .

Each customer level [*activity* ④ ,⑦] verifies conformance between supplier IDs and the PRDs.

Depending upon the project, space agencies can play different roles. They can be the consumer when they intend to benefit from the services of the system. They can be the first level customer under a mandate given by a consumer, but they can also be the supplier when they provide products at a given level in the customer-supplier network (e.g. space-agency-furnished equipment or services). In all situations the requirements of ECSS Standards apply.

Table 1: Participants' roles in customer-supplier network

Participants' roles in customer-supplier network		Outputs ⇒				
Level	Participant ⇓	Requirements and expectations	Project constraints: - financial, - political, - managerial, ...	Project requirements documents	Demonstration of compliance for the outputs to be supplied	Supply of outputs
0	**Consumer** [a]	R	A			
	First-level customer (Can be consumer or consumer's agent) [b]	AR	R	R	A	
1	**First-level supplier** [c] (who is also	C	C	A	R	R
	Customer from next level supplier)	AR for next level	R for next level	R for next level	A for next level	
2	**Next-level supplier** [d] (who is also	C	C	A	R	R
	Customer from next-level supplier, etc.)	etc.	etc.	etc.	etc.	

NOTE R = Responsible for doing the activity A = Agreement with activity output C = Consulted.

[a] e.g. End user: commercial organization, space agency, armed forces, coordinated inter-governmental organization, experimenter.

[b] e.g. Space agency, governmental project management office.

[c] e.g. Prime contractor.

[d] i.e. Level 2, 3, 4, etc., repeated as necessary.

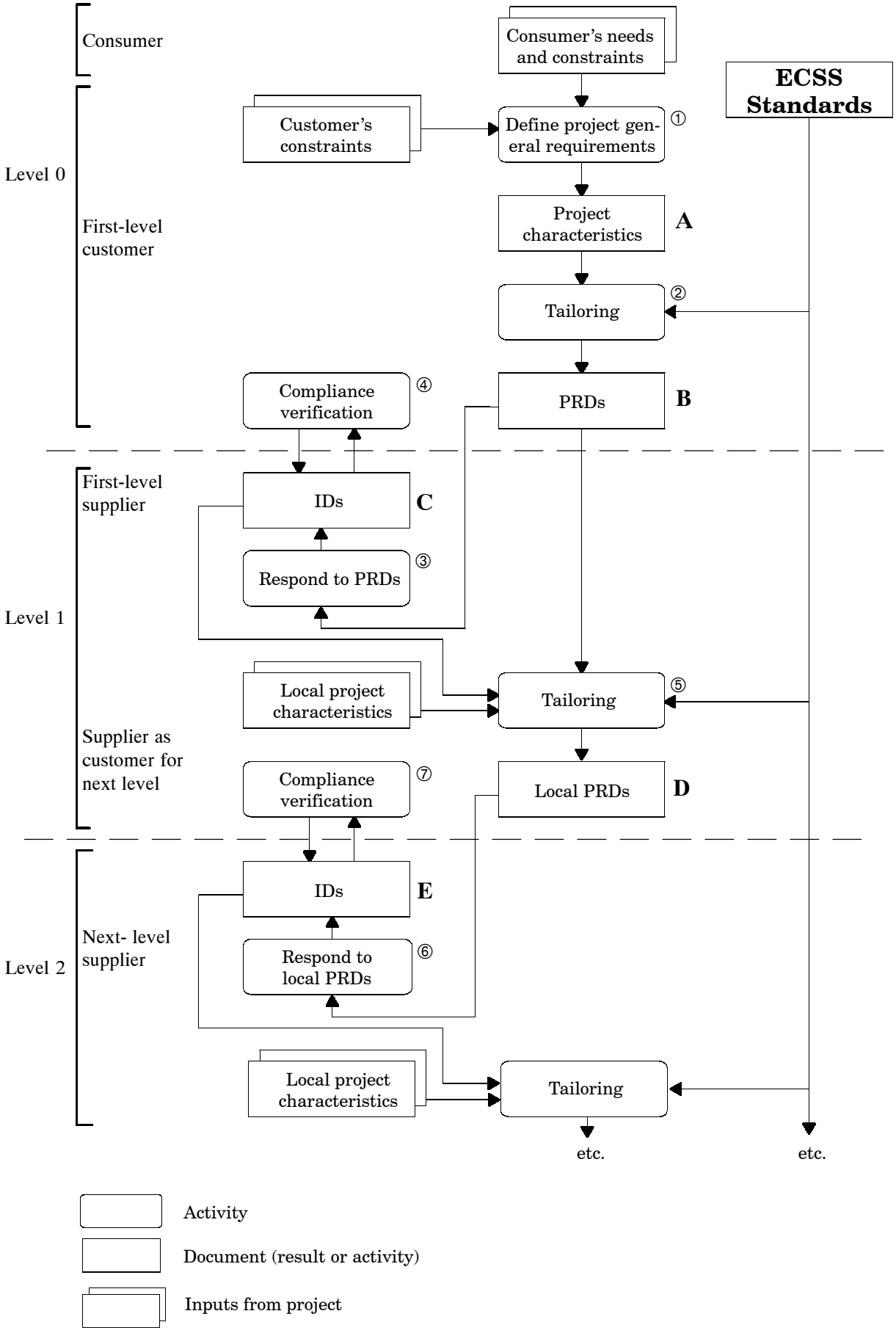

Figure 1: Customer-supplier network concept for PRD establishment

4.4 Tailoring of standards

ECSS Standards draw together a large body of space standards applicable to all the products and projects. However, the application of ECSS Standards to a specific project requires, at all project organization levels, the implementation of a tailoring process in the framework of the customer-supplier network.

The result of this process is the elaboration of customer requirements applicable to supplier(s).

Selection of requirements during the tailoring process may concern the choice of requirements to be taken into account, possible modification of some of them and the implementation (processes, tooling, described in level 3 documents), whether imposed or not, for some or all of the actors.

The application of the tailoring of ECSS Standards is illustrated in Figure 1.

At each customer level, tailoring of ECSS Standards is needed in order to meet the requirements and expectations of the customer in the most cost effective way. For that, tailoring is based on identified project objectives and constraints.

The tailoring of the ECSS Standards to the specific project needs is done according to a number of characteristics such as:

- the overall project risks, their criticality and their consequences with regard to technical performance, cost and schedule (refer to subclause 5.3);
- the class of products (refer to ECSS-E-00);
- industrial policy;
- the project complexity;
- technology maturity.

Each customer analyses and assesses the part of the project for which they are responsible, according to the combination of technical and programmatic characteristics, both quantitative and qualitative, that are understood in a cross-disciplinary context.

NOTE A particular characteristic can have implications for several disciplines and the relationship between them, e.g. a “low cost” project with a “small” project team can require in the first instance “light” project management. However, if significant technology development is involved, carrying high risks, a standard approach, as followed in the procurement of off-the-shelf technology, is probably inappropriate.

Characteristics expressed by numerical thresholds, such as the overall value of a project, are indicative and should not be treated as rigid categories. To that end, tailoring is carried out in an iterative and disciplined manner, involving a high degree of professional judgement, experience and expertise.

This project characterization facilitates the tailoring of requirements and thus establishes a framework, within which to execute the project, that meets the requirements of the consumer appropriate for the project objectives and constraints. The characterization of projects and the requirements tailoring processes are defined in ECSS-M-00-02.

At any level of the customer-supplier network, an appropriate authority within the customer organization verifies the consistency of local procedures and methodologies with the application of ECSS Standards, in order to avoid conflict between customer requirements and the ECSS Standards.

5

Major elements of project management

5.1 Overall objective

The overall objective of project management is to implement a process to achieve successful completion of the project in terms of technical, cost and schedule performance. This requires the implementation of suitable methods and techniques to support the people managing the project. Project management is performed following a structured approach to manage the scope, quality, time, cost, organization and logistics of the project, throughout all stages of its life cycle and at all levels of its hierarchy.

Project management provides the framework for the definition and implementation of the project through planning, organization, performance monitoring, assessment of the results, introducing recovery actions or changes, if necessary, in order to meet overall project objectives.

It also integrates the other core functions related to the execution of a project, which are grouped into engineering and product assurance disciplines within the ECSS Standards.

5.2 Overall policy and principles

The overall objective of project management, given in 5.1, is met by the implementation of the following principles:

- Project objectives are clearly defined, understood, and known to all participants at the outset of the project, and objectives are maintained during the life cycle of the project. This enables and motivates all participants to work towards a common goal.
- The project is managed with a structured approach, by breaking down the project into manageable elements. This allows scope definition, responsibility assignment, planning, monitoring and reporting at the levels of detail chosen for visibility and control.
- Project management includes measurement of achievements by the identification and tracking of deliverables during the evolution of the project. The totality of all deliverables, conformant with the requirements, contributes to the successful completion of the project.

- Formal relationships are established between project participants to allocate responsibility boundaries and to govern interfaces between them. The formalized relations provide the means to establish an infrastructure for conducting business consistently and efficiently.
- The incorporation of quality into the product is the responsibility of everyone in the customer-supplier network.
- The responsibility for monitoring, assessing and certifying that quality has been incorporated is clearly allocated at each level in the network.
- Project management includes risk management as inherent in all aspects of project work.
- Project management includes the management of human resources, which is fundamental to the success of the project.

Major elements of project management to serve these principles are:

- management of risk,
- project breakdown structures,
- project organization,
- project phasing and planning,
- configuration management,
- information/documentation management,
- cost and schedule management,
- integrated logistic support,
- product assurance management, and
- engineering management.

5.3 Management of risk

5.3.1 Objective

Risks are integral elements of any project. In space projects, there are specific risk aspects:

- specific environmental conditions of space;
- for high level of performance;
- low production number;
- related high costs involved;
- high development effort with limited opportunity for amortization over production;
- inability to fully operate the space element on ground under realistic conditions;
- limited access to the product during operation.

The consequences of the risks are of very broad range, from performance reduction, cost increase and schedule delays, to mission failure, damage to property and consequential loss, environmental impact, loss of life or illness or injury.

The objective of the management of risk is to identify all risks and to keep these risks within defined and accepted boundaries, which constitute the risk policy for the concerned project.

Risk management aims at all aspects of the programme, including performance (technical and quality), programmatic (funding, political environment), cost (contract performance and project cost), schedule and operation (logistic support, dependability and safety).

5.3.2 Policy and principles

Risk management is an integral part of the project's management. Management of risk should be central to the project manager's understanding of the project. Management of risk is an important part of the overall project management with respect to the process of project decisions. Risk data are one element in the multi-attribute decision making process.

Any difficulty in attaining the project objectives is communicated to the concerned parties, including the consumer when applicable, at the earliest opportunity.

The management of risk includes:

- the systematic identification, evaluation and classification of all risk causes and consequences prior to definition and implementation of a decision to accept, to monitor or to take action. The risk assessment supports the decision making process, including consideration of uncertainties about the risk involved;
- the systematic definition, implementation, control and verification of actions appropriate for elimination or reduction of risk to an acceptable level.

More details, descriptions and requirements are given in ECSS-M-00-03.

5.4 Project breakdown structures

5.4.1 Objectives

The project breakdown structures, which constitute the common and unique reference system for the project management, have the following objectives:

- ensure the coherence between technical, documentary, administrative and financial activities of the whole project;
- identify the responsibilities of each actor;
- provide a frame for planning, scheduling, costing and means of control.

5.4.2 Policy and principles

These objectives are achieved by observing the following policy and principles:

- Project breakdown structures derive from the functional requirements of the first-level customer (function tree); through the detail definition of system elements (product tree); leading to the definition of tasks to develop and produce an element (work breakdown structure); against which the breakdown of cost categories can be mapped (cost breakdown structure), together with the allocation of the industrial organization (business agreement structure).
- Project breakdown structures provide breakdown of project objectives and content for different purposes, but they are coherent between themselves, in a systematic top-down approach.

More details, descriptions and requirements are given in ECSS-M-10.

5.5 Project organization

5.5.1 Objective

The project organization objective is to make the actors' existing structures compatible with the requirements and constraints of the project concerned.

5.5.2 Policy and principles

The objective is achieved by elaboration of project management schemes applicable to all the actors in a space project, addressing in particular:

- responsibility and authority of the participants;
- resource requirements;
- personnel qualification and training;
- interrelation between the participants;
- business-agreement-related aspects between the participants;
- facilities and logistics (e.g. offices, cleanrooms);
- information technology and systems;
- project documentation.

More details, descriptions and requirements are given in ECSS-M-20.

5.6 Project phasing and planning

5.6.1 Objective

The objective of project phasing and planning is to minimize the technical, scheduling and economic risks of the project. This is done by introducing phases and formal milestones enabling the progress of the project to be controlled with respect to cost, schedule and technical objectives.

5.6.2 Policy and principles

The objective is achieved by observing the following policy and principles:

- At the beginning of the project, distinct phases are identified in the project life cycle, with clearly defined overall objectives and work content, which are further elaborated as the project progresses.
- The project phases are tied to each other by milestones, enabling control of technical, cost and schedule progress and the subsequent operation of the system.
- A formal review is conducted at each milestone, controlling the evolution of the technical baseline, which is subject to configuration management, appropriately documented.
- The number of phases, their objectives and content can be tailored, taking into account the cost, schedule and technical risks to the successful completion of the project.

More details, descriptions and requirements are given in ECSS-M-30.

5.7 Configuration management

5.7.1 Objectives

The objectives of configuration management are to identify, describe and control the technical description of the system in a traceable way and throughout its life cycle.

5.7.2 Policy and principles

These objectives are achieved by the drawing up and validation of configuration baselines at predefined stages and by controlling their evolution.

Configuration management addresses in particular:

- the identification and description of each entity in the system subject to configuration control;
- the establishment of configuration baselines;
- the control of the evolution of the configurations from established baselines;

- the control of interfaces;
- the establishment of a documented configuration status at any time in the project life cycle, including all the agreed changes;
- the validation of completeness of the configuration identification;
- the identification of discrepancies related to the configuration of the system.

More details, descriptions and requirements are given in ECSS-M-40.

5.8 Information/documentation management

5.8.1 Objective

The objective of information/documentation management in the context of project management is to ensure that the information necessary for effective execution of all the other management processes can be recorded, retrieved and modified in a traceable, effective manner.

5.8.2 Policy and principles

The objective is achieved by observing the following policy and principles:

- Information/documentation management being performed as an essential support function in the execution of the project.
- Customer requirements for information/documentation systems respecting the supplier's established practices and systems, where efficient.
- Except where national or commercial security considerations demand otherwise, information/documentation management systems being open to all project users, who determine their own access requirements.
- Authority and responsibility for information content, input and retrieval being placed within the project organization at the level closest to the data source, to avoid non-value-adding interventions by intermediate layers.
- Information/documentation management system allowing measurement of its performance so that its activity can continually be improved.

More details, descriptions and requirements are given in ECSS-M-50.

5.9 Cost and schedule management

5.9.1 Objective

The objective of cost and schedule management is to provide a collective system of organized processes and actions in support of project management. This is aimed at establishing the optimum use of human resources, facilities, materials and funds in order to achieve the successful completion of the space project within its established goals:

- cost targets;
- timely completion;
- technical performance.

Cost and schedule management allows costs and tasks to be planned and actively controlled.

5.9.2 Policy and principles

The objective is achieved by observing the following policy and principles:

- Work is planned and controlled on the basis of the work breakdown structure, to a level of detail commensurate with the achieved design maturity and adequate to the project phase for which tasks and cost are planned.

- Costs are estimated and planned by cost categories, on the basis of defined economic conditions.
- Reference cost data serve for cost reporting and control, at the level of detail and frequency specified in the business agreement.
- Schedule planning and control is implemented by establishing and maintaining a schedule of project activities, identifying external interfaces and project milestones, including payment milestones.
- Reference schedule data serve for schedule reporting and control, at the level of detail and frequency specified in the business agreement.
- Critical cost and schedule items requiring attention are subject to special reviews.
- Deviations from baseline plans affecting project milestones identified in the business agreement are corrected by re-planning, subject to customer approval.

More details, descriptions and requirements are given in ECSS-M-60.

5.10 Integrated logistic support

5.10.1 Objective

The objective of integrated logistic support is to ensure the satisfaction of requirements in terms of logistic support throughout the system life cycle.

5.10.2 Policy and principles

The objective is achieved by observing the following policy and principles:

- definition of the support system, which aims at maintaining the technical and availability performance of the system and which includes all the support resources being delivered as well as implemented;
- integration of the logistic support activities into the project activities;
- deployment of such activities throughout the system life cycle.

More details, descriptions and requirements are given in ECSS-M-70.

5.11 Product assurance management

5.11.1 Objective

The objectives of Product Assurance management are to provide an efficient and effective management of all the Product Assurance functions required by the project and to ensure that Product Assurance requirements are adhered to by all elements of the project.

5.11.2 Policy and principles

These objectives are achieved by observing the following policies and principles:

- establishing a Product Assurance management structure optimized to the needs of the project;
- clearly defining management and technical responsibilities for each Product Assurance function, with clear reporting lines;
- clearly defining management and technical interfaces between the various Product Assurance functions;
- clearly defining management and technical interfaces with other elements within the project structure, and with external bodies;
- assuring the necessary independence and authority of the overall Product Assurance function by ensuring a separate and direct reporting line to the highest authority outside the project.

More details, descriptions and requirements are given in the Q-series of ECSS Standards.

5.12 Engineering management

5.12.1 Objective

The objectives of Engineering Management within a project organisation are to provide efficient and effective management of all of the engineering functions and disciplines required by the project, and to provide this within a coherent project structure with clearly defined responsibility assignments.

5.12.2 Policy and principles

These objectives are achieved by observing the following policies and principles:

- establishing an engineering management structure, optimised to the needs of the project;
- clearly defining management and technical responsibilities for each engineering function and discipline with clear reporting lines;
- clearly defining management and technical interfaces between the various engineering functions and disciplines;
- clearly defining management and technical interfaces with the elements within the project structure as well as with external bodies.

More details, descriptions and requirements are given in the E-series of ECSS Standards.

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6

Project management requirements

6.1 General

This ECSS Standard is limited to defining the highest level of project management requirements on the customer and supplier for the preparation and generation of the project management plan.

More detailed requirements for each of the major elements of the project management plan are addressed in the ECSS-M, -E or -Q series of standards, as called up in clause 5 of this Standard.

The requirements applicable to a project are identified in documents called the project requirements documents (PRDs). A PRD includes all normative references that establish requirements which are subsequently used to control work or work products. In particular, they contain a tailored set of requirements derived from the ECSS-M, -E or -Q series of standards.

The formal responses of a supplier describing how the requirements in the PRDs are met at their level and in respect of their own organization are called implementation documents (IDs).

In this ECSS Standard, in order to facilitate reading, tailoring and traceability, the requirements are listed according to numbered topics. Often an explanatory text, such as the aim of the requirement or the expected output, is attached to the numbered requirement.

6.2 Overall requirements for the customer

a. The customer at every level shall use the ECSS Standards to establish the project management requirements.

b. The customer at every level shall specify the minimum requirements necessary for their supplier to achieve the project objectives.

c. The customer at every level shall consider tailoring in order to minimize requirements.

NOTE Guidelines for tailoring are given in ECSS-M-00-02.

d. The project management requirements shall only specify what shall be achieved, not how it shall be done.

e. The project management requirements shall use standard terms and definitions wherever practicable.

EXPECTED OUTPUT: *Project management requirements*.

6.3 Overall requirements for the supplier

The supplier at every level shall respond to the project management requirements with a project management plan as defined in Annex B.

EXPECTED OUTPUT: *Project management plan.*

Annex A (informative)

ECSS Standards architecture and domains

The ECSS Standards system has three branches, designated as management, engineering, and product assurance (see Figure A-1). These branches are introduced by level 1 documents numbered, respectively, ECSS-M-00, ECSS–E-00 and ECSS-Q-00. These top-level standards are both of a normative and an informative nature. The basic principles described therein are presented in detail in level 2 standards. Methodology guidelines and constraints are presented in level 3 standards.

ECSS-M-00, the top-level standard in the management branch, serves to introduce the domain, content and architecture of the ECSS Standards system. It also covers common topics such as tailoring, risk management and overall project management, which are applicable to all branches of ECSS. Tailoring and risk management requirements are defined in specific standards within the management branch (numbered M-00-02 and M-00-03, respectively).

The following points explain the role of the ECSS management standards, together with their interfaces with the ECSS engineering standards and the ECSS product assurance standards:

- The ECSS management standards define the process requirements to be applied to the overall project activities during the life cycle. They describe what shall be achieved to establish project breakdown structures (e.g. product tree, work breakdown structure), the project organization and cost and schedule management, and cover also the management of configuration, documentation and integrated logistic support.
- The ECSS product assurance standards define the requirements for the management and performance of product assurance activities during a space project (e.g. quality assurance, dependability, safety, EEE components control, materials, mechanical parts and processes control, software product assurance).
- The ECSS engineering standards are devoted to the products themselves as well as to their use and disposal. They cover:
  - the engineering process as applied to space systems and their elements or functions;
  - technical aspects of parts, assemblies, equipments, sub-systems and systems used to accomplish, or associated with, space missions.

  They include specifications, guidelines, manuals, handbooks and procedures, all identified as ECSS Standards. Their objective is to enable

engineers to work as efficiently as possible and to achieve the most appropriate product for the project application.

Level 3 standards, which are not represented on Figure A-1, include:

- methodology guidelines;
- description of recommended procedures;
- presentation of formats, protocols or interfaces for information exchange;
- definition of the information to be exchanged between actors in document requirements definition (DRD).

All these standards are designated in the ECSS Standards system under the generic title of level 3 standards and are numbered: ECSS-M (or Q or E)-XX-YY.

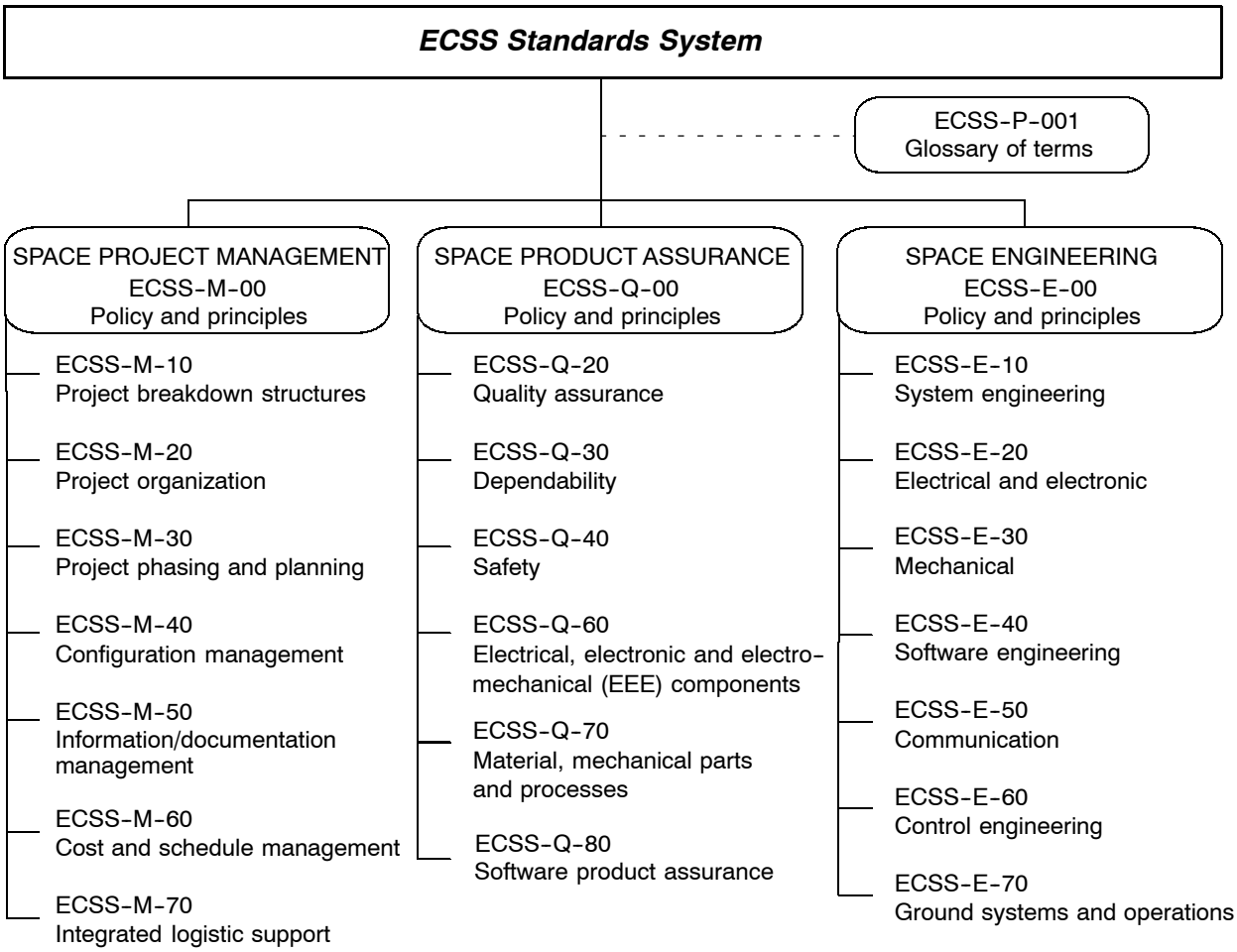

Figure A-1: Structure of the ECSS Standards system (for level 1 and 2 standards)

Annex B (normative)

Project management plan DRD

B.1 Introduction

This DRD defines the requirements for establishing the project management plan, which can consist of one or several documents.

B.2 Scope and applicability

B.2.1 Scope

This DRD establishes the data content requirement for the project management plan as controlled by the following source document:

ECSS-M-00 Space project management — Project management

This DRD does not define format, presentation or delivery requirements for the project management plan.

B.2.2 Applicability

This DRD is applicable to all projects using the ECSS Standards.

B.3 Terms, definitions and abbreviated terms

For the purpose of this DRD, the definitions and abbreviations given in ECSS-P-001 and in ECSS-M-00 shall apply.

B.4 Description and purposes

The project management plan is prepared to state the purpose and provide a brief introduction to the project management system. It covers all aspects of the latter. It is maintained and updated during the life cycle of the project.

B.5 Application and interrelationship

A Project Management Plan is prepared for each tendering phase of a project throughout the whole life cycle of the programme or project. Where a programme consists of several inter-related projects, each project shall have a project management plan.

B.6 Project management plan preliminary elements

B.6.1 Title

The document to be created based on this DRD shall be titled "[insert the configuration item name] Project management plan".

B.6.2 Title page

The title page of this document shall identify the project document identification number, title of the document, date of release and release authority.

B.6.3 Structure

The project management plan should contain the following clauses and subclauses:

Foreword

Content list

Introduction

1 Scope and Applicability

1.1 Scope

1.2 Applicability

2 References

2.1 Normative references

2.2 Informative references

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

3.2 Abbreviated terms

4 Risk management

5 Project breakdown structures

6 Project organization

7 Project phasing and planning

8 Configuration management

9 Documentation and information management

10 Cost and schedule management

11 ILS (Integrated logistic support)

12 Product assurance management

13 Engineering management

B.6.4 Foreword

A foreword shall be included in the document describing the following items as are applicable to the project:

- Identification of which organizational entity prepared the document;
- Information regarding the approval of the document;
- Identification of other organizations that contributed to the preparation of the document;

- A statement of effectiveness identifying which other documents are cancelled and replaced in whole or in part;
- A statement of significant changes between this document and any previous document;
- The relationship of this document to other standards or documents.

B.6.5 Content list

The content list shall identify the title and location of every clause, major subclause, figure, table and annex contained in the document.

B.6.6 Introduction

The introduction shall contain a brief description of the purpose of the project management plan and its objectives. The purpose is to provide the rules that shall be applied to manage the project.

B.7 Project management plan content

B.7.1 Scope and applicability

B.7.1.1 Scope

This subclause shall contain a statement defining the project management approach and methodology to be used throughout the life cycle of the project.

B.7.1.2 Applicability

This subclause shall contain a statement defining applicability of the project management plan across all phases of the project.

B.7.2 References

B.7.2.1 Normative references

This subclause shall contain the following statements:

> "The following normative documents contain provisions, which through reference in this text constitute provisions of this customer requirement document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this customer requirement document 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 normative document referred to applies.
>
> [insert document identifier] [insert document title]"

B.7.2.2 Informative references

This subclause shall contain the following statements:

> "The following documents, although not a part of this project management plan, amplify or classify its contents.
>
> [insert document identifier] [insert document title]"

B.7.3 Terms, definitions and abbreviated terms

B.7.3.1 Terms and definitions

This subclause shall list any applicable project dictionary or glossary, and all unusual terms with a meaning specific to the project management plan with a definition for each term.

If a project dictionary or glossary is applicable, the following sentence shall be inserted:

> "The definitions of [insert title and identifier of applicable dictionaries or glossaries] apply to this document"

Insert the following sentence:

> "The following terms and definitions are specific to this document:
>
> [insert term] [insert definition]"

B.7.3.2 Abbreviated terms

This subclause shall list all abbreviations used in the project management plan with full meaning or phrase for each abbreviation.

B.7.4 Risk management

This clause shall briefly describe the risk management approach which can be described in more detail in a dedicated risk management policy and plan.

B.7.5 Project breakdown structures

This clause shall define all breakdown structures used to present project information normally presented in chart form:

- Function tree,
- Product tree,
- Work breakdown structure (WBS),
- Other structures, and
- Work packages description.

B.7.6 Project organization

This clause shall describe the project organization at all levels and shall include a list of key personnel. It can be contained in a dedicated project organization plan, in which case this clause need only contain a brief description together with a pointer to the project organisation plan.

B.7.7 Project phasing and planning

This clause shall describe the project phasing and planning approach. It can be contained in a dedicated design and development plan, in which case this clause need only contain a brief description together with a pointer to the design and development plan.

B.7.8 Configuration management

This clause shall describe the configuration management approach. It can be contained in a dedicated configuration management plan, in which case this clause need only contain a brief description together with a pointer to the configuration management plan.

B.7.9 Documentation and information management

This clause shall describe the documentation and information management approach. It can be described in a dedicated documentation and information management plan, in which case this clause need only contain a brief description together with a pointer to the documentation and information management plan.

B.7.10 Cost and schedule management

This clause shall describe the methodology, processes and means to ensure timely completion of the project within the approved budget.

It shall be based on the work and organization breakdown structures and interfaces, and shall be consistent with the project phasing and planning.

It shall address, as a minimum, milestone management, margins management, progress reporting, resources and cost management. It shall also define the methods to be employed to undertake recovery actions, should these become necessary.

B.7.11 ILS (Integrated logistic support)

This clause shall define material resources, spare provisioning and essential services required to support operation, maintenance and control of associated operational risks particularly in terms of utilisation cost and availability.

B.7.12 Product assurance management

This clause shall describe the product assurance management approach. It can be described in a dedicated product assurance plan, in which case this clause need only contain a brief description together with a pointer to the product assurance plan.

B.7.13 Engineering management

This clause shall describe the engineering management approach, including the proposed breakdown into engineering disciplines and the interfaces between these disciplines.

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ECSS Document Improvement Proposal

1. Document I.D.	2. Document date	3. Document title
ECSS-M-00B	29 August 2003	Policy and principles

4. Recommended improvement (identify clauses, subclauses and include modified text or graphic, attach pages as necessary)

5. Reason for recommendation

6. Originator of recommendation

Name:	Organization:	
Address:	Phone: Fax: e-mail:	**7. Date of submission:**

8. Send to ECSS Secretariat

Name:	Address:	Phone: +31-71-565-3952
W. Kriedte	ESTEC, P.O. Box 299	Fax: +31-71-565-6839
ESA-TOS/QR	2200 AG Noordwijk	e-mail: Werner.Kriedte@esa.int
	The Netherlands	

Note: The originator of the submission should complete items 4, 5, 6 and 7.

An electronic version of this form is available in the ECSS website at: http://www.ecss.nl/
At the website, select “Standards” - “ECSS forms” - “ECSS Document Improvement Proposal”

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