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Space Project Management

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Management

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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. 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

The objective of Information/Documentation Management during a space project life cycle is to ensure that every actor has ready access to all the information he needs in order to perform his task.

This information, current at a particular time or event in a project's life cycle, is captured in documents, which may be in the form of paper, electronic or other media.

The flow of information inside a project organisation is of paramount importance for the achievement of success and needs to be covered by industry standard requirements understood by every actor.

Proper information/documentation management helps team building, but should not be confused with day to day information exchanges during the course of the project.

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Scope

The present document 'Information/Documentation Management' is part of the collection of ECSS standards. Its purpose is to define the principles and requirements to be observed during the management of project information (including documentation).

This standard applies to all the documents and the information contained therein, irrespective of media in which they are stored and/or transmitted.

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

Information management shall be implemented during all the phases of the 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-40 Configuration Management.
 - ECSS-M-60 Cost and Schedule Management.
 - ECSS-M-70 Integrated Logistic Support.
- Other normative references:
- ECSS-Q-00 Product Assurance

2.2 Informative References

- | | |
|---------------|---|
| RG Aéro 00040 | General Recommendation for the Project Management Specification. |
| CNES IM-70-00 | Gestion de la Documentation. |
| MR-P/01 | Management Requirements on Industrial Contracts. (supersedes ESA PC/941904/TD/510) |
| ISO 8879 | Information processing; Text and Office Systems; Standard Generalised Mark-up Language (SGML) |

| | |
|-------------------|--|
| ISO 9069 | Information processing; SGML Support Facilities; SGML Document Interchange Format (SDIF). |
| ISO/IEC/DIS 10179 | Information technology – Text and Office systems – Document Style Semantics and Specification Language (DSSSL) (Draft Standard). |

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.

Actor
Business Agreement
Configuration
Configuration Document
Contract
Contractual Baseline
Customer
Data
Document
Documentation
Documenting
Implementation Document
Information
Phase (Project Phase)
Purchaser
Process
Product Tree
Project
Project Requirements Document
Reference Document
Resource
Space Element
Space System
Specification
Supplier
System

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

“Authorisation of a Document: Contractual release of a document.”

“Document Release

Action to confirm that the information which is contained in the document can be circulated and used within a project. The authority releasing a document formalises this action by a traceable means (e.g. physical or electronic).”

“Document for agreement

Document to be submitted to an authority before being used. Failure to respond to this within a specified period from receipt is considered in effect as an agreement.”

NOTE An agreement implies that:

- the authority has noted that the document complies with all the contract requirements,
- the authority has recorded no objection to its entry into practice, but does not accept any liability as regards the use of the document.

In the case where the authority raises remarks and comments, it shall bring them to the issuer’s knowledge in accordance with the contractual clauses.

Specific disagreement by the purchaser with the document will require re-work and re-submission.

“Document for approval

Document submitted to a named authority, which shall give its approval prior to use.”

NOTE After approval, the document becomes applicable.

The entry into practice is only possible after the document’s approval by the authority concerned. This approval shall be notified to the originator within a period in accordance with the contractual clauses. This period is valid for all the documents submitted to the approval procedure.

On no account shall approval free any actor from its contractual obligations. (See ECSS-M-20).

The document shall carry objective evidence of its approval status.

Specific disagreement by the purchaser with the document will require re-work and re-submission.

“Document for information

Any document, whether contractual or not, which is not subject to approval or agreement and about which the receiving authority can state opinions or comments.”

“Document required

Document figuring in a list appended to the contract (list of required documents), which specifies the documents forming part of the contractual supply.”

NOTE This list specifies the number of specimens, the support used, the status (provisional, final), the periodicity, the events (contract, reviews, ...) And the subject of the transmission (approval, agreement, information).

“Modular document structure

A document set made up of standard blocks which enables them to be used for a specific project, if necessary supplemented by documents tailored for project-specific requirements.”

3.2 Abbreviations

The following abbreviations are defined and used within this standard.

| Abbreviation | Meaning |
|---------------------|--|
| ECSS: | European Cooperation for Space Standardization |

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Fundamentals of Information/Documentation Management

4.1 Objectives

To provide useful and essential information to the numerous actors (both internal and external) involved in the project: customers, suppliers, operators, the public, the consumer and other project groups.

To achieve this, information management shall:

- be based upon output requirements,
- ensure the correctness, accessibility, rapid availability, reliability and security of information provided to all the actors involved in the project, as well as any outside people 'needing to know', irrespective of the medium employed,
- ensure the coherence of the overall project information set, so facilitating effective and efficient use of the information by people both internal and external to the project, either during or after the project (with the usual allowances for security),
- ensure that all the actors who need access to information are informed of its availability, the means of access and related methods and procedures, or otherwise directly receive up-to-date information as required to fulfil their activities,
- support the project reporting system as fully defined in ECSS-M-20.

4.2 Policy and Principles

The principle governing information management is that the information system used shall employ the least complex process which is capable of meeting the project information processing, control, distribution and archiving requirements. In particular:

- Customers shall not impose particular methodologies, implementation techniques or organisations on suppliers, but rather shall specify the desired outcome.
- Except where national or commercial security demands otherwise, information/documentation management systems shall be 'open' to all project users who will determine and define their own access needs.

- Authority and responsibility for information content and input shall be placed uniquely and at the lowest possible level in the project organisation to avoid non-value-adding interventions by intermediate layers.
- The responsibility for accuracy, reliability and speed of provision of information shall lie solely with its author.
- The responsibility for coherence of any information set or subset shall lie solely with the coordinating author or manager of that set or subset.
- Information availability requirements shall be defined by the users of the information.
- Responsibility for retrieval of information lies with its user.
- The information management system shall allow the measurement of performance so that its activity can be continually improved.
- The timely availability of accurate information is an essential contribution to the overall risk management of the project.

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*).

Requirements for Information Management

5.1 General Requirements

5.1.1

Requirements relating to the information flow of the project shall be specified by the customer in the Project Requirements Documents.

AIM: Establish a framework for information flow within the project.

EXPECTED OUTPUT: *Information flow requirements as part of the Project Requirements Documents.*

5.1.2

The consumer and customer shall not impose changes on existing suppliers information systems unless the project information system performance or interface requirements can not otherwise be met.

This system shall be documented.

AIM: Avoid unnecessary changes to suppliers' established in-house systems.

This will allow the suppliers to implement systems which meet their business objectives and needs.

EXPECTED OUTPUT: – *Minimum system changes,*
– *System description.*

5.1.3

All the project information system users and managers shall be trained in the system use by the appropriate actors on a regular basis.

AIM: Avoid parallel uncontrolled information flows and to minimise errors in operation.

EXPECTED OUTPUT: *Trained information system users and managers.*

5.1.4

The language(s) to be employed in project information exchanges shall be specified.

AIM: Minimise the opportunity for mis-interpretation of information.

EXPECTED OUTPUT: *Agreed information exchange languages.*

5.2 Author Responsibilities

5.2.1

Responsibility for information input into the information system shall lie solely with the author of the information.

AIM: Ensure that authority and responsibility for information input are coincident in the same person.

EXPECTED OUTPUT: *Information system with a single point of authority and responsibility for each piece of information.*

5.2.2

The quality and the speed of availability of the information input into the system (i.e. completeness, subject focus, clarity, lack of ambiguity, logical basis) shall lie solely with the author.

AIM: Ensure that the authority and responsibility for the quality and speed of availability of information are coincident in the same person.

EXPECTED OUTPUT: *An information system with clearly identified authorities and responsibilities for input.*

5.3 Information Availability Requirements

5.3.1

The information system information availability requirements shall be defined by the information system users. These information system user requirements shall be traceable to the originators.

AIM: User-defined information availability requirements.

System user requirements should cover such topics as the scope of information to be made available, its security, structured performance metrics, information summaries, change control and traceability.

EXPECTED OUTPUT: *Information system based upon users needs, in accordance with documented user requirements.*

5.3.2

The information system shall place responsibility for information retrieval with the information system users.

AIM: Place initiative for information retrieval with the information system users.

EXPECTED OUTPUT: *Open information system.*

5.3.3

The only restriction of information availability to project actors shall be those of commercial confidentiality or national security.

AIM: Maximise availability of information to project actors.

EXPECTED OUTPUT: *Open information system.*

5.3.4

Controls shall be implemented to prevent and detect erroneous information and unauthorised access.

AIM: Ensure the security and integrity of the information system.

5.4 Information System Evaluation

5.4.1

The owner of each information system shall systematically review the performance of his information system, and shall determine whether it continues to be appropriate in the current phase of the project, and meets the full requirements of its users.

AIM: Measurement of information system performance.

Performance evaluation should address such user requirements as speed of response, waiting time, down time, information loss, processing time, security, including, if appropriate, variations over time.

EXPECTED OUTPUT: *Improved information system performance.*

5.4.2

Risks identified following the evaluation of the information system shall be handled as part of the overall risk management.

AIM: Detect and assess the risk to have delayed or corrupted information, or unauthorised access.

EXPECTED OUTPUT: *Contribution to the overall risk management of the project.*

5.4.3

All the actors shall implement a process for continuous improvement of information system performance, based upon the evaluation.

AIM: Establish a mechanism for improving system performance.

EXPECTED OUTPUT: *Continuous improvement of information system performance.*

5.5 Alignment with Project Management Processes

5.5.1

The project information system shall be an integral and unduplicated part of the project management processes.

AIM: Maximise the effectivity of the combined project information and management processes.

EXPECTED OUTPUT: *Non redundant project information system.*

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Requirements for Documentation Management

6.1 General Requirements

6.1.1

Documents shall be stored in a manner that enables easy and speedy retrieval.

AIM: Efficient retrieval of information.

EXPECTED OUTPUT: *Documented filing methodology and identified resources.
An efficient information retrieval system.*

6.1.2

Documents shall be protected according to the level of confidentiality of information they contain.

AIM: Prevent access to confidential information by unauthorised persons.

The document shall carry objective evidence of its confidentiality classification if any, with the sections, subsections or paragraphs that are the subject of the restriction clearly identified. The confidentiality classes shall be mutually agreed.

EXPECTED OUTPUT: *An information system with safeguards against unauthorised access to information which, if disclosed, could be prejudicial to commercial or national interests. This shall be compatible with the aim of Requirement 5.3.3 which is to have an open information system.*

6.1.3

Documents shall be stored in a manner that protects the information which they contain against foreseeable hazards, e.g. fire, flood, earthquake, etc.

AIM: Ensure survivability of information.

EXPECTED OUTPUT: *A document storage system that protects the information contained therein from unplanned damage or destruction.*

6.1.4

The information system shall enable all documents to be identified unambiguously, including issue status.

AIM: The avoidance of confusion.

For configuration aspects of documents see ECSS-M-40.

EXPECTED OUTPUT: *A document identification scheme.*

6.1.5

The data format for exchange and delivery of documents shall be specified, and where available conform to international standards.

AIM: The speedy and efficient transfer of information.

EXPECTED OUTPUT: *Documented project data format standards for the exchange and delivery of information.
Definition of data processing media and application programmes to be used.*

6.1.6

Where practicable, documents shall have a modular structure in order to facilitate re-use in future projects.

AIM: Reduce work in future projects and thereby increase competitiveness.

EXPECTED OUTPUT: *Modular, standardized documents*

6.1.7

Where multi-location information retrieval is planned, project documentation shall be prepared to an agreed standard format and structure.

AIM: Efficient information retrieval and document comparisons.

EXPECTED OUTPUT: *Agreed documentation formats and structures for multi-location use.*

6.1.8

Each actor shall establish a baseline list of required documents, shall define their scope and intended distribution and shall place this list under configuration control.

AIM: Enable documents to be correctly scoped, controlled and distributed in a timely manner.

This list should contain:

- the type of document,
- the title,
- the identifier (reference, issue/revision),
- the provisional and actual publication dates,
- the document class and category.

EXPECTED OUTPUT: *A project required document list under configuration control.*

6.1.9

Each document shall carry objective evidence of its current category, i.e. for approval, for agreement, for information, etc.

AIM: Identify the role of the document between the actors.

EXPECTED OUTPUT: *Categorised documents.*

6.1.10

Each actor shall identify which documents have to be kept in hard copy (or other authorised media) because of national and/or international legal requirements.

AIM: Conform with national and international law in respect of document retrieval.

The project shall identify the minimum set of relevant documents necessary to satisfy the legal aspects of the requirements.

EXPECTED OUTPUT: *List(s) of documents required to be maintained by law.*

6.2 Release Responsibilities

6.2.1

Each document shall be verified in accordance with 5.3.1 before being made available via the information system.

AIM: Ensure that only verified documents are used.

EXPECTED OUTPUT: *Only verified documents in use.*

6.2.2

For contractual documents, the contractually agreed approval or agreement procedure shall be recorded in the Implementation Document for Documentation Management.

AIM: Explicitly identify contractual document management roles and responsibilities with respect to approval and agreement.

The procedure should cover:

- the entities which grant approval or agreement.
- the need for a formal request for approval or agreement of a document to be sent by the issuer to the required authority.
- the period for approving or agreeing a document specified in the Project Requirements Document.
- the request for a formal notice in case of any disagreement, whether regarding the shape and/or the substance of the document, which would cite the contradictory comments, written to the issuer on the part of the approval or agreement authority.
- the fact that reservations or contradictory comments prevent any approval or agreement from being pronounced.
- the objective evidence on the document of approval notification (after agreement on both substance and form) by the authority, the beginning of official and contractual circulation of the document by the issuer afterward.
- the applicability of the document conditioned by any comment of the authority that is judged contradictory.
- the words 'approval pending' on the title page and over the running text of the document, when for technical or scheduling reasons, circulation is necessary prior to approval.

- the objective evidence on the document of agreement notification by the authority.

The procedure can also cover:

- the number of copies of the document, specified in the project, to be sent for approval to the approval authority, bearing the words 'approval pending'.
- the number of copies of the document, required in the project documents, to be sent for agreement to the required authority, bearing the words 'agreement pending'.
- the employment of no official circulation procedure other than the approval circuit by the authority issuing a document for approval.

Failing a formal response by the agreement authority within the contractually stated period, the document is deemed to be 'agreed' without reservations and a mention to this effect is marked on the title page by the issuer.

EXPECTED OUTPUT: *An element of the Implementation Document for Documentation Management covering approval and agreement of contractual documents.*

6.3 Document Availability and Distribution

6.3.1

The project actors shall be informed in a timely manner of the existence of, and have access to, whatever documents they need for project execution.

AIM: Make required documents available in a timely manner.

The authority empowered to receive and/or make documents available shall be designated in the Documentation Management Document.

EXPECTED OUTPUT: *Timely availability of current documentation.*

6.3.2

Each actor shall ensure that all required project documentation is readily available for the period defined in the business agreement.

AIM: Make project documentation available as and when required.

The issuer of a document shall keep the original, irrespective of the medium, whether it is part of the deliverable documentation or not, for a period to be specified in the project. Accordingly, the circulation of a document only affects its copies (except as regards documents submitted for approval or agreement).

The documentation supervisor shall keep and maintain available a copy of each document issued or received in the framework of the project. These copies shall be filed in suitable premises to ensure their availability and the required degree of confidentiality.

EXPECTED OUTPUT: *An element of the Implementation Document for Documentation Management covering document storage and retrieval for the total agreed period.
Accessible stored documentation.*

6.4 Archiving

6.4.1

Steps shall be taken to ensure the protection of the documentation.

AIM: Ensure the integrity of information over time.

Documents and information media shall be archived in sites, areas, premises, of-fice furniture etc. or devices that are able to guarantee:

- adequate material conservation conditions against risks associated with the environment (weather, flood, fire, heat, electromagnetic radiation etc.),
- to the extent practicable adequate protection against aggression and/or break-in's or other intrusion (physical attack, data piracy, bugging etc.), or any other type of destruction (insects, rodents etc.),
- permanency of information.

Outdated documents can be withdrawn from the filing system and archived according to the conditions specified in the Documentation Management Document. The archiving rules shall allow easy access.

Document archiving durations and conditions shall be compatible with the requirements of the project, the operations phase, and creation of the project technical report.

6.5 Implementation Document for Documentation Management

6.5.1

Each actor shall draw up an Implementation Document for Documentation Management for 'purchaser' approval and incorporation into the contractual baseline.

6.5.2

The Implementation Document for Documentation Management shall exist for each phase of a project but be appropriately scoped to the complexity of the work being performed.

6.5.3

The Implementation Document for Documentation Management shall specify both project specific and normal in-house procedures employed for controlling each type of document.

6.5.4

The Implementation Document for Documentation Management shall specify the operational procedures employed for ensuring approval or agreement of documents.

6.5.5

Each actor is responsible for approving the Implementation Document for Documentation Management of his suppliers.

6.5.6

All the Implementation Documents for Documentation Management for a given project shall cover the related document management activities, without redundancy, but also without 'gaps'.

AIM: Enable the customer to verify that the supplier's strategy for documentation management is compatible with the customer's organisation and project needs.

The ECSS-M-30 standard specifies the project phase at which the management Implementation Documents shall be drawn up, evaluated and accepted.

EXPECTED OUTPUT: *an Implementation Document for Documentation Management acceptable to both the customer and supplier.*

6.5.7

Each actor shall define his process for the receipt, assessment, authorisation and distribution of documents received from the actor's customer and supplier(s) in the Implementation Document for Documentation Management.

AIM: Define the process for the receipt and distribution of incoming documents.

The procedure shall cover:

- The methods employed for drawing up the circulation lists are specified in the Implementation Document for Documentation Management.
- The circulation of documents shall be organised on a delivery-slip basis, with details of the reason for the issue ('for approval', 'for agreement', 'for information', 'for application' etc.).
- Steps shall be taken to guarantee that the users of a document are systematically apprised of each change (per the list of recipients).

EXPECTED OUTPUT: *an element of the Implementation Document for Documentation Management.*