SLOVENSKI STANDARD
SIST EN 16603-10-24:2017

01-oktober-2017

Vesoljska tehnika - Upravljanje vmesnika

Space engineering - Interface management

Raumfahrttechnik - Schnittstellenmanagement

Ingénierie spatiale - Gestion des interfaces

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ICS:

49.140	Vesoljski sistemi in operacije	Space systems and operations

SIST EN 16603-10-24:2017 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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This European Standard was approved by CEN on 22 August 2016.

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European foreword

This document (EN 16603-10-24:2017) has been prepared by Technical Committee CEN-CENELEC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-10-24:2017) originates from ECSS-E-ST-10-24C.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

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This document has been developed to cover specifically space systems and has therefore precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

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Introduction

The management and control of interfaces is crucial to the success of space programmes and projects. Interface management is a process to assist in controlling product development when efforts are divided amongst different parties (e.g. agencies, contractors, geographically dispersed technical teams). Interface control is also needed to define, achieve and maintain compliance between products and actors that interoperate.

The application of this standard to a project is expected to bring the following benefits:

- a consistent, coherent and commonly used approach – including documentation – throughout industry and across different projects;
- effective and efficient product interface management;
- minimize the risk of interface incompatibilities;
- high confidence in achieving successful product operations for the intended use.

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1 Scope

The objective of interface management is to achieve functional and physical compatibility amongst all interrelated items in the product tree. The goal of this standard is to define a common and systematic process to meet the objective.

This standard describes a standard process and methodology for interface management throughout the life cycle, in terms of identification, requirements specification, definition, approval and control, implementation, verification and validation of interfaces, within a space programme or project and in accordance with the other relevant ECSS standards.

In line with the definition of the Space System breakdown in Figure 2-1 of ECSS-S-ST-00-01, this standard is applicable to the following interfaces, where a contractual relationship exist among parties:

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- within the Space Segment
- within the Ground Segment
- between the Space Segment and the Ground Segment
- between Space Segment and Launch Segment only for ICD aspects in conformance to the launcher user manual.

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This standard does not ensure that all the specificities of interfaces within the Launch Segment are covered.

This standard is applicable to development of products at all different levels in the product tree. It is applicable to both the customer and the supplier of the product during all project phases (0 to F) and follows the generic ECSS customer/supplier pattern.

This standard may be tailored for the specific characteristics and constrains of a space project in conformance with ECSS-S-ST-00.

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2
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 revision 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 more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

EN reference	Reference in text	Title
EN 16601-00-01	ECSS-S-ST-00-01	ECSS - Glossary of terms
EN 16003-10	ECSS-E-ST-10	Space engineering - System engineering general requirements
EN 16003-10-02	ECSS-E-ST-10-02	Space engineering - Verification
EN 16003-10-06	ECSS-E-ST-10-06	Space engineering - Technical requirements specification
EN 16001-10	ECSS-M-ST-10	Space project management - Project planning and implementation
EN 16001-40	ECSS-M-ST-40	Space project management - Configuration and information management
EN 16002-10-09	ECSS-Q-ST-10-09	Space product assurance - Nonconformance control system

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3
Terms, definitions and abbreviated terms

3.1 Terms from other standards

a. For the purpose of this Standard, the terms and definitions from ECSS-S-ST-00-01 apply, in particular for the following terms:

1. approval
2. baseline
3. configuration baseline
4. customer
5. interface
6. supplier

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b. For the purpose of this Standard, the following term and definition from ECSS-E-ST-10-06 applies:

1. verification requirements

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c. For the purpose of this Standard, the following terms and definitions from ECSS-M-ST-40 apply:

1. change request
2. change proposal

3.2 Terms specific to the present standard

3.2.1 controlled ICD

ICD formally issued subject to configuration control process

3.2.2 external interface

interface between items under different programme responsibilities

3.2.3 frozen ICD

ICD formally issued subject to configuration control process and signed by interface responsible and all the involved actors

NOTE 1 A “frozen” ICD reflects the design baseline that is considered, for the interface related aspects, to be final and complete allowing start of manufacturing, integration, implementation and testing activities.

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NOTE 2 Change of a "frozen" ICD can occur but it usually implies a major cost or schedule impact.

3.2.4 interface actor

<CONTEXT:role> responsible for the design, development and verification of one interface end

NOTE The interface actors are all parties involved in the interface ends definition, design, development.

3.2.5 interface control document (ICD)

document defining the design of the interface(s)

3.2.6 interface definition document (IDD)

document defining the design of one interface end

3.2.7 interface end

one side of an interface

NOTE An interface end is the point of interaction of one of the elements of an interface.

3.2.8 interface identification document

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document defining the index of all identified interfaces

3.2.9 interface plane

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plane that distinguishes the two interface ends that interface with each other

3.2.10 interface requirement document (IRD)

document defining the requirements for an interface or a collection of interfaces.

3.2.11 interface responsible

<CONTEXT:role> responsible for the requirement specification, definition, development and verification of the interface

NOTE The interface responsible is the customer or his delegate, as an example for space segment to launch segment interface, it is the entity procuring both or its delegates.

3.2.12 internal interface

interface between items within the same programme responsibility

3.2.13 preliminary ICD

draft ICD circulated and iterated during interface definition phase before issuing a controlled ICD

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3.3 Abbreviated terms

For the purpose of this Standard, the abbreviated terms from ECSS-S-ST-00-01 and the following apply:

Abbreviation	Meaning
CCSDS	Consultative Committee for Space Data Systems
CR	change request
CP	change proposal
ECSS	European Cooperation for Space Standardization
ICD	interface control document
IDD	interface definition document
IID	interface identification document
IRD	interface requirements document
OTS	off-the-shelf

3.4 Nomenclature

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The following nomenclature applies throughout this document:

a. The word "shall" is used in this Standard to express requirements. All the requirements are expressed with the word "shall".

b. The word "should" is used in this Standard to express recommendations. All the recommendations are expressed with the word "should".

NOTE It is expected that, during tailoring, recommendations in this document are either converted into requirements or tailored out.

c. The words "may" and "need not" are used in this Standard to express positive and negative permissions, respectively. All the positive permissions are expressed with the word "may". All the negative permissions are expressed with the words "need not".

d. The word "can" is used in this Standard to express capabilities or possibilities, and therefore, if not accompanied by one of the previous words, it implies descriptive text.

NOTE In ECSS "may" and "can" have completely different meanings: "may" is normative (permission), and "can" is descriptive.

e. The present and past tenses are used in this Standard to express statements of fact, and therefore they imply descriptive text.

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4
Principles

4.1 Type of interfaces

In a Space System there can be three major types of interfaces.

- interfaces within the Space Segment, Ground Segment or Launch Segment.
- interfaces between the different Segments of the Space System.
- interfaces between the Support Segment and the Space Segment, Ground Segment or Launch Segment.

Refer to Figure 2-1 of ECSS-S-ST-00-01 for details on Space System breakdown.

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In addition, a distinction can be made between internal and external interfaces.

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The notion of internal or external depends on the position and role of an actor in the customer supplier chain.

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An internal interface is an interface under the control of a given actor.

An external interface is an interface outside the control of a given actor.

For example, an interface between two suppliers of the same customer is considered external by the suppliers and internal by the customer.

4.2 Interface management process

4.2.1 General description

The interface management process is applied at all levels of the supplier/customer chain.

The standard describes the process at one level, between one customer and its lower tier suppliers.

The customer or his delegate is responsible for the definition, development and verification of the interface.

In addition to the interface responsible, the interface actors are all the parties involved in the interface end definition, design, development.

This process can impact the similar activities done at higher or lower levels.

As per ECSS-S-ST-00-01, the term “product” is used in the standard as a generic term which defines any component, equipment or element.

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Annex E provides a non-exhaustive list of interface data, that can be used as a basis for interface specification, definition and control.

Figure 4-1 provides an overview of the interface management process.

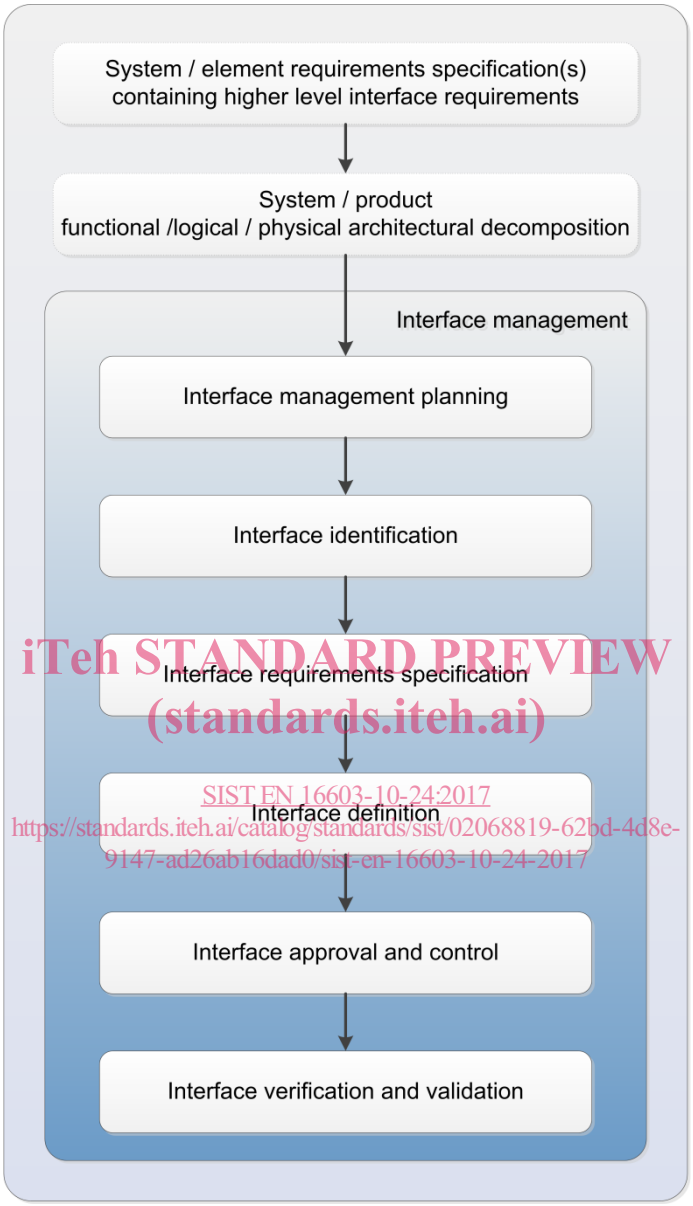

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Figure 4-1 Interface management process – overview of the main process steps

4.2.2 Interface management planning

At the beginning of the project, each customer defines the approach, the requirements, the responsibilities and the planning for the management of the interfaces.

4.2.3 Interface identification

At the beginning of the project, each customer identifies the interfaces under his responsibility.

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This process is repeated by each actor at each level of the customer/supplier chain.

The interface identification is based on product architecture definition, i.e.:

- Product functions identification/definition
- Product decomposition into elements
- Functions allocation to elements

Then the interface identification is further detailed according to the product architecture decomposition.

The identified interfaces can be compiled into a list, including identification of the involved suppliers, as well as the references to the applicable technical documentation.

The output of the interface identification process can be documented in an Interface Identification Document (IID). An example of an IID is given in the informative Annex D.

The IID is a living document which is populated and updated during the interface life cycle, with the references to IRD, ICD, IDD, CR when they become baselined.

The IID becomes therefore the repository that defines and governs the interface baseline status and their unique identification.

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4.2.4 Interface requirements specification

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Following the interfaces identification, each customer defines the requirements for each interface.

The establishment of interface requirements is part of the requirement engineering process as defined in ECSS-E-ST-10 clause 5.2.

The interface requirements on the identified interfaces are derived from the higher level requirements and functional, logical and physical architectural decomposition, as well as the verification requirements.

An interface requirement defines the functional, performance, electrical, environmental, human, and physical requirements that exist at a common boundary between two or more products.

When the interface requirements specification is completed and baselined, it defines all the design requirements to be adhered to by the supplier who is responsible for the design, development and verification of the interface ends.

The output of the interface requirements specification process is documented in IRDs or in technical requirement specifications.

An IRD applies to the entire interface, including all interface ends.

For each interface requirement, applicability for involved interface end is specified (e.g. one interface end, all interface ends).

The use of an IRD as a self-standing document is not mandatory, however it facilitates consistency of the interface requirements among all involved actors.