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SLOVENSKI STANDARD
kSIST-TP FprCEN/CLC/TR 17602-80-12:2021

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Zagotavljanje kakovosti proizvodov v vesoljski tehniki - Ocenjevanje in izboljšanje programske opreme - 12. del: Instrument ocenjevalca

Space product assurance - Software process assessment and improvement - Part 12: Assessor instrument

Space Product Assurance - Bewertung und Verbesserung von Softwareprozessen - Teil 12: Assessor-Instrument

Assurance produit des projets spatiaux - Évaluation et amélioration des processus logiciels - Partie 12 : Instruments des évaluateurs

Ta slovenski standard je istoveten z: **FprCEN/CLC/TR 17602-80-12**

__ICS:__

03.120.99	Drugi standardi v zvezi s kakovostjo	Other standards related to quality
35.240.99	Uporabniške rešitve IT na drugih področjih	IT applications in other fields
49.140	Vesoljski sistemi in operacije	Space systems and operations

kSIST-TP FprCEN/CLC/TR 17602-80-12:2021 en,fr,de

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

**FINAL DRAFT
FprCEN/CLC/TR 17602-80-12**

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English version

Space product assurance - Software process assessment and improvement - Part 12: Assessor instrument

Assurance produit des projets spatiaux - Évaluation et amélioration des processus logiciels - Partie 12 : Instruments des évaluateurs

Space Product Assurance - Bewertung und Verbesserung von Softwareprozessen - Teil 12: Assessor-Instrument

This draft Technical Report is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/CLC/JTC 5.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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FprCEN/CLC/TR 17602-80-12:2021 (E)

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European Foreword

This document (FprCEN/CLC/TR 17602-80-12:2021) has been prepared by Technical Committee CEN/CLC/JTC 5 "Space", the secretariat of which is held by DIN.

It is highlighted that this technical report does not contain any requirement but only collection of data or descriptions and guidelines about how to organize and perform the work in support of EN 16602-80.

This Technical report (FprCEN/CLC/TR 17602-80-12:2021) originates from ECSS-Q-HB-80-02 Part 2A.

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 mandate given to CEN by the European Commission and the European Free Trade Association.

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

This document is currently submitted to the CEN CONSULTATION.

Introduction

This Standard provides the instruments needed by competent assessors to perform assessments and to support improvement initiatives based on the framework described in TR 17603-80-11 (equivalent to ECSS-Q-HB-80-02 Part 1).

The ECSS-Q-HB-80-02 assessment method is a space specific instantiation of ISO/IEC 15504-5. In turn, ISO/IEC 15504 provides a common internationally recognized framework for the terminology and reference process assessment description.

The instruments provided in this handbook, when applied by competent assessors, support application of the methods described in Part 1 and allow claiming conformance to those methods and to requirements in ECSS-Q-ST-80. Specific instruments are also provided to enable claiming conformance to the requirements in ISO/IEC 15504 for process assessments as an additional advantage of the application of this Standard.

While the instruments provided in this handbook may be provide useful information to participants in process assessment and improvement in general, their use is intended specifically for competent assessors. This handbook does not pose any requirements on the organisations being assessed or carrying out process improvement programmes whether using the methods described in Part 1 or not.

1
Scope

This handbook provides assessors with a number of instruments needed to perform software process capability assessments using the assessment method described in Part 1. It also provides instruments that help assessors to carry out their activities when performing assessments and supporting the implementation of software process improvement initiatives using the method for process improvement described in Part 1.

The instruments provided are:

- The Process Assessment Model (PAM) required to perform ECSS-Q-HB-80-02 assessments including process descriptions and process attribute indicators

- Conformance statement to the requirements in ISO/IEC 15504 Part 2

- A definition of the Process Reference Model (PRM) on which the ECSS-Q-HB-80-02 PAM is based (defined in ECSS-Q-HB-80-02 Part 1)

- Detailed traces from base practices in the ECSS-Q-HB-80-02 PAM to ECSS standards clauses and from ECSS-Q-HB-80-02 work products to ECSS expected outputs

2
References

EN Reference	EN in text	Title
EN- 16601-00-01	ECSS-S-ST-00-01	ECSS System - Glossary of terms
EN 16601-10	ECSS-M-ST-10C rev.1	Space project management - Project planning and implementation
EN 16601-10-01	ECSS-M-ST-10-01C	Space project management - Organization and conduct of reviews
EN 16601-40	ECSS-M-ST-40C rev.1	Space project management - Configuration and information management
EN 16601-60	ECSS-M-ST-60C	Space project management - Cost and schedule management
EN 16601-80	ECSS-M-ST-80C	Space project management - Risk management
EN 16602-10	ECSS-Q-ST-10C	Space product assurance - Product assurance management
EN 16602-10-04	ECSS-Q-ST-10-04C	Space product assurance - Critical-item control
EN 16602-10-09	ECSS-Q-ST-10-09C	Space product assurance - Nonconformance control system
EN 16602-20	ECSS-Q-ST-20C	Space product assurance - Quality assurance
EN 16602-20-07	ECSS-Q-20-07A	Space product assurance - Quality assurance for test centres
EN 16602-30	ECSS-Q-ST-30C	Space product assurance - Dependability
EN 16602-40	ECSS-Q-ST-40C	Space product assurance - Safety
EN 16602-80	ECSS-Q-ST-80C	Space product assurance – Software product assurance
EN 16603-10	ECSS-E-ST-10C	System engineering general requirements
EN 16603-10-02	ECSS-E-ST-10-02C	Space engineering - Verification
EN 16603-10-03	ECSS-E-10-03A	Space engineering - Testing
EN 16603-40	ECSS-E-ST-40C	Space engineering – Software

ISO/IEC 15504: 2003-2006   Information technology – Process assessment

Part 1: Concepts and vocabulary (normative)

Part 2: Performing an assessment (normative)

Part 3: Guidance on performing an assessment (informative)

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Part 4: Guidance on use for process improvement and process capability determination (informative)
Part 5: An exemplar process assessment model (informative)

ISO/IEC 12207: 2004
Amd 1/Amd 2

Information Technology – Software life cycle processes

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3
Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purpose of this document, the terms and definitions from ECSS-S-ST-00-01 and ECSS-Q-HB-80-02 Part 1 apply.

3.2 Abbreviated terms

For the purpose of this document, the abbreviated terms from ECSS-S-ST-00-01, ECSS-Q-HB-80-02 part 1 and the following apply.

Abbreviation	Meaning
ISVV	Independent Software Verification and Validation
PAM	Process Assessment Model
PRM	Process Reference Model

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4
Process Assessment Model

4.1 Process dimension

4.1.1 Introduction

This clause defines the process dimension of the process assessment model (PAM). The process dimension is directly mapped to the process list defined in the Process Reference Model (PRM) which is based on ISO/IEC 12207 Amendment 1+Amendment 2 and adds a number of space specific processes to it.

The PRM is defined in ECSS-Q-HB-80-02 Part 1.

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The process dimension contains three categories organized in the groups of processes listed in Table 4-1. Processes added in this Standard over the ones in ISO/IEC 15504 Part 5 are marked in bold.

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Table 4-1: ECSS-Q-HB-80-02 set of processes

Primary life cycle processes		
Acquisition process group(ACQ)	ACQ.1	Acquisition preparation
	ACQ.2	Supplier selection
	ACQ.3	Contract agreement
	ACQ.4	Supplier monitoring
	ACQ.5	Customer acceptance
	ACQ.6(*)	Contract maintenance
Supply process group (SPL)	SPL.1	Supplier tendering
	SPL.2	Product release
	SPL.3	Product acceptance support
Operation process group (OPE)	OPE.1	Operational use
	OPE.2	Customer support
Engineering process group (ENG)	ENG.1	Requirements elicitation
	ENG.2	System requirements analysis
	ENG.3	System architecture design
	ENG.4	Software requirements analysis
	ENG.5	Software Design
	ENG.6	Software construction

	ENG.7	Software integration
	ENG.8	Software testing
	ENG.9	System integration
	ENG.10	System testing
	ENG.11	Software installation
	ENG.12	Software and system maintenance
Supporting life cycle processes		
Supporting process (SUP)	SUP.1	Quality assurance
	SUP.2	Verification
	SUP.3	Validation
	SUP.4	Joint review
	SUP.5	Audit
	SUP.6	Product evaluation
	SUP.7	Documentation
	SUP.8	Configuration management
	SUP.9	Problem resolution management
	SUP.10	Change request management
	SUP.11(*)	Safety and dependability assurance
	SUP.12(*)	Independent software verification and validation
Organizational life cycle processes		
Management process group (MAN)	MAN.1	Organizational alignment
	MAN.2	Organization management
	MAN.3	Project management
	MAN.4	Quality management
	MAN.5	Risk management
	MAN.6	Measurement
	MAN.7(*)	Information management
Process improvement process group (PIM)	PIM.1	Process establishment
	PIM.2	Process assessment
	PIM.3	Process Improvement
Resource and infrastructure process group (RIN)	RIN.1	Human resource management
	RIN.2	Training
	RIN.3	Knowledge management
	RIN.4	Infrastructure
Reuse process group (REU)	REU.1	Asset Management
	REU.2	Reuse program management
	REU.3	Domain engineering
(*) : processes added in this handbook w.r.t the ones in ISO/IEC 15504 Part 5		

These categories and basic processes correspond to all processes involved for the development of software for space. Requirements applied for their performance are mostly described in ECSS-Q-ST-80C and ECSS-E-ST-40C but also in other Management, Engineering and Quality ECSS Standards. The links between Base Practices of S4S PAM and ECSS requirements are provided in this document.

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4.1.2   Process definitions

This clause provides definitions for all the processes in the PAM. The definitions provided here are mostly based on those in ISO/IEC 15504 Part 5. The definitions are an instrument for competent assessors when measuring the capability of processes in an organization. Other parties may use them as a source of information but they do not construe requirements for the implementation of processes. The definition of each process consists of:

- A process identifier consisting of a code for the process group and a process number within that group
- The process name
- The process purpose
- The process outcomes

The definition of each process is supported by a number of indicators to help assessors in rating the process:

- A set of base practices mapped to the process outcomes. These base practices are the activities and tasks that should be present in implementing the process. Some of these base practices are of special relevance for specific software criticality classes. This is reflected by specifying where relevant the classes to which the base practice is most relevant. The definition used here for those criticality classes is the same one used in the example target capability profiles proposed in Part 1 of this standard.

- Where relevant, notes that clarify the meaning, or show possible implementations of specific base practices either per se or in relation to ECSS. Notes originating from ISO/IEC 15504 are assigned a sequential number. Space or ECSS specific notes are assigned an uppercase letter. These notes are not intended to represent requirements but to provide assessors with additional information in interpreting the process definition in the context of space projects. The notes describe common practice in space projects. In some instances the notes give an indication that ECSS standards do impose specific requirements. Note that short references like ECSS-Q-80 refers to ECSS-Q-ST-80C as identified in chapter 2.

- Input and output work products associated to the process. Most work products originate in the ISO/IEC 15504-5 definition of the process but slight differences may have been introduced to better match to the ECSS PRM. A few of them have been added specifically to the PAM and are space specific.

Components of the process definitions taken from ISO/IEC 15504 are shown in normal text while ECSS-Q-HB-80-02 specific additions are shown in *italics*.

Please note that the material taken from ISO/IEC 15504 (normal text) may not always comply with standard terminology and conventions applicable to ECSS standards. The space specific material (in *italics*) in the process definitions has been written with the ECSS conventions in mind but sometimes these are not followed to keep the uniformity and consistency between ISO/IEC 15504 material and ECSS-Q-HB-80-02 specific material.

4.1.2.1   Acquisition process group (ACQ)

4.1.2.1.1   ACQ.1 Acquisition Preparation

Process ID	ACQ.1
Process Name	Acquisition Preparation
Process Purpose	The purpose of the Acquisition Preparation process is to establish the needs and goals of the acquisition and to communicate these with the potential suppliers.
Process Outcomes	As a result of successful implementation of the Acquisition Preparation process: 1) the concept or the need for the acquisition, development, or enhancement is established; 2) the needed acquisition requirements defining the project needs are defined and validated; 3) the customer's known requirements are defined and validated; 4) an acquisition strategy is developed; and 5) supplier selection criteria are defined.

Base Practices	**ACQ.1.BP1: Establish the need.**
	Establish a need to acquire, develop, or enhance a system, software product or service. [Outcomes: 1]
	
	ACQ.1.BP2: Define the requirements.
	Identify the customer/stakeholder requirements for a system and/or software product or service. [Outcomes: 2; 3]
	
	NOTE A: Establish requirements for each supplier.
	            Project Requirements Documents (= Requests for proposal) are issued by the customer to all of his subordinate suppliers. The Project Requirements Documents includes requirements for all aspects of the project and not be limited to technical requirements.
	            The customer releases the Functional Specification for the product.
	            The customer should specify the technical budget target and margin philosophy. Here technical budgets refer to those associated with computer resources (CPU load, maximum memory size) and performance requirements.
	NOTE B: For space segment software, the criticality levels of the software elements are determined at the functional state of the project.
	            For space segment software, the requirements of in-flight modification capabilities of the software elements are determined at this stage .
	            The customer's need for a MMI mock-up is defined at this stage, and if so, general MMI standards and guidelines applicable to the project are established.
	
	ACQ.1.BP3: Review requirements.
	Analyze and validate the defined requirements against the identified needs. Validate the requirements to reduce risk of misunderstanding by the potential suppliers. [Outcomes:3]
	
	ACQ.1.BP4: Develop acquisition strategy.
	Develop a strategy for the acquisition of the product according to the acquisition needs. [Outcomes: 4]
	
	NOTE 1: The strategy may include reference to the lifecycle model, schedule,