ICS 49.140 SLOVENSKÁ TECHNICKÁ NORMA December 2020

STN	**Kozmická technika** **Platforma pre simulačné softvérové modelovanie**	**STN** **EN 16603-40-07** 31 0543

Space engineering - Simulation modelling platform

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/20

Obsahuje: EN 16603-40-07:2020

131619

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 16603-40-07

June 2020

ICS 49.140

English version

Space engineering - Simulation modelling platform

Ingénierie spatiale - Plateforme de modélisation pour simulation

Raumfahrttechnik - Teil 40-07: Modelliersoftware-Platform

This European Standard was approved by CEN on 17 May 2020.

CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN and CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

CEN-CENELEC Management Centre:
Rue de la Science 23, B-1040 Brussels

Table of contents

Figures

Tables

European foreword

This document (EN 16603-40-07:2020) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16603-40-07:2020) originates from ECSS-E-ST-40-07C.

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of an identical text or by endorsement, at the latest by December 2020, and conflicting national standards shall be withdrawn at the latest by December 2020.

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.

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).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Space programmes have developed simulation software for a number of years, which are used for a variety of applications including analysis, engineering operations preparation and training. Typically, different departments perform developments of these simulators, running on several different platforms and using different computer languages. A variety of subcontractors are involved in these projects and as a result a wide range of simulation software are often developed. This standard addresses the issues related to portability and reuse of simulation models. It is based on the work performed by ESA in the development of the Simulator Model Portability Standards SMP1 and SMP2 starting from the mid-end of the nineties.

This standard integrates the ECSS-E-ST-40 with additional requirements which are specific to the development of simulation software. The formulation of this standard takes into account:

- The existing ISO 9000 family of documents, and
- The Simulation Model Portability specification version 1.2.

The intended readership of this standard is the simulator software customer and supplier.

1 Scope

ECSS-E-ST-40-07 is a standard based on ECSS-E-ST-40 for the engineering of simulation software.

ECSS-E-ST-40-07 complements ECSS-E-ST-40 in being more specific to simulation software. Simulation software include both Simulation environments and simulation models. The standard enables the effective reuse of simulation models within and between space projects and their stakeholders. In particular, the standard supports model reuse across different simulation environments and exchange between different organizations and missions.

This standard can be used as an additional standard to ECSS-E-ST-40 providing the additional requirements which are specific to simulation software.

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

Applicability

This standard lays down requirements for simulation software including both Simulation environments and simulation models. The requirements cover simulation models' interfaces and simulation environment interfaces for the purpose of model re-use and exchange to allow simulation models to be run in any conformant simulation environment.

A consequence of being compliant to this standard for a model is the *possibility* of being reused in several simulation facilities or even in several projects. However, adherence to this standard does not imply or guarantees model reusability, it is only a precondition. Other characteristics of the model, to be defined outside this standard, such as its functional interfaces and behaviour, its configuration data as well as quality, suitability and performance, etc. are also heavily affecting the potential for a model to be reused. In addition, agreements need to be reached on simulation environments compatibility, model validation status as well as legal issues and export control restrictions.

Therefore, this standard *enables* but does not mandate, impose nor guarantee successful model re-use and exchange.

Model reuse in this standard is meant both at source-code and binary level, with the latter restricted to a fixed platform.

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 system - Glossary of terms
EN 16603-40	ECSS-E-ST-40	Space engineering - Software general requirements
	[SMP_FILES]	ECSS_SMP_Issue1(2March2020).zip – SMP C++ Header files, SMP XML schemas and SMP Catalogue. (Available from ECSS website)
	https://www.w3.org/TR/xmlschema11-2/	XML schema specification
	http://www.opengroup.org	The UUID specification from Open Group.
	https://www.osgi.org/developer/specifications/	OSGi Specifications