



BSI Standards Publication

Space engineering — Technology readiness level (TRL) guidelines

National foreword

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**Space engineering - Technology readiness level (TRL)
guidelines**

Ingénierie spatiale - Guide d'utilisation des Niveaux de
Maturité Technologique (NMT)

Raumfahrttechnik - Richtlinien zum technischen
Reifegrad (TRL)

This Technical Report was approved by CEN on 26 March 2021. It has been drawn up by the Technical Committee CEN/CLC/JTC 5.

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

Table of contents

European Foreword	5
Introduction	6
1 Scope	7
2 References	8
3 Terms, definitions and abbreviated terms	10
3.1 Terms defined in other documents.....	10
3.2 Terms specific to the present document	11
3.3 Abbreviated terms and symbols.....	11
4 TRL history and evolution	13
4.1 History and evolution	13
4.2 Differences between M95r and ISO 16290 standard as seen by ECSS (European interpretation).....	13
4.3 TRL implementation in ECSS system	14
4.4 TRL and assessment basic principles.....	14
5 Technology readiness assessment (TRA) guidelines	17
5.1 Introduction.....	17
5.2 General principles for technology readiness assessment.....	17
5.2.1 TRL standard	17
5.2.2 TRA pre-requisites	21
5.2.3 Independent verification of the TRL.....	22
5.2.4 Discipline specific TRA process	22
5.2.5 Typical technology readiness assessment (TRA) process.....	22
5.2.6 TRA criteria.....	23
5.2.7 Viability of TRL progression	23
5.3 TRL evaluation by level	24
5.3.1 TRL 1: Basic principles observed and reported	24
5.3.2 TRL 2: Technology concept and/or application formulated	24
5.3.3 TRL 3: Analytical and experimental critical function and/or characteristic proof-of-concept	24

5.3.4	TRL 4 : Component and/or breadboard functional verification in laboratory environment	25
5.3.5	TRL 5 : Component and/or breadboard critical function verification in a relevant environment.....	26
5.3.6	TRL 6: Model demonstrating the critical functions of the element in a relevant environment.....	27
5.3.7	TRL 7 : Model demonstrating the element performance for the operational environment.....	28
5.3.8	TRL 8 : Actual system completed and accepted for flight (“flight qualified”).....	28
5.3.9	TRL 9: Actual system “flight proven” through successful mission operations	29
5.4	Guidelines for other uses of TRLs in R&T&D activities	29
6	Implementation in projects	32
6.1	General.....	32
6.2	Critical functions and technologies in projects.....	33
6.2.1	Overview.....	33
6.2.2	Technology readiness status list (TRSL) and transference to critical item list.....	34
6.3	Technology readiness assessment (TRA) in projects	34
6.4	Typical levels linked to project phases and milestones	35
7	Links with model philosophy and technology demonstration and reassessment	39
7.1	Links with model types and technology demonstration	39
7.1.1	Link between TRL and model types	39
7.1.2	Link between TRL and technology demonstrators.....	42
7.2	Re-assessment of TRL for re-use of element with existing TRA	44
7.2.1	Technical guidelines.....	44
7.2.2	Technology re-use in a new environment.....	46
Annex A	TRL considerations for software	47
A.1	Terms specific to the present annex	47
A.2	ISO TRL scale and software developments	48
A.3	Basic principles.....	48
A.4	Use of TRL with Software	49
A.5	Relationship between TRL and criticality categories	56
Annex B	TRL considerations for EEE components	57
Annex C	TRL considerations for materials and manufacturing processes	59

Figures

Figure 4-1: Illustration of differences between M95r (European interpretation) and ECSS-E-AS-11..... 14

Figure 4-2: Evolution technology maturity..... 15

Figure 5-1: Illustration of a new RF transistor then RF amplifier progressing through TRL..... 21

Figure 5-2: Example of ESA technology activity template..... 30

Figure 5-3: Illustration of a Technology Roadmap 31

Figure 6-1: Risk versus TRL and complexity 33

Figure 6-2: Evolution of technology options during preliminary project phases 35

Figure 6-3: Project phases and generalised institutional expectation of TRA outcome 37

Figure 6-4: Project phases and generalised commercial expectation of TRA outcome 38

Tables

Table 5-1: TRL summary - Milestones and work achievement (*adapted from ISO 16290*)..... 18

Table 6-1: Benefits of use of TRA..... 36

Table 7-1: Models types associated to TRLs 40

Table 7-2: Use of commonly-used models for TRL progression 42

Table 7-3: Links between TRL and Heritage Category 45

Table 7-4: Technology maturity transfer for re-use 46

Table A-1 : Link between Software development status and TRL..... 50

Table B-1 : Milestones and work achievement for EEE components TRL..... 57

Table C-1 : Use of TRL for with materials and manufacturing process development 60

European Foreword

This document (CEN/CLC/TR 17603-11:2021) 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 16603-11.

This Technical report (CEN/CLC/TR 17603-11:2021) originates from ECSS-E-HB-11A.

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).

Introduction

This Handbook supports the application of the TRL, and provides guidelines to its use in projects and its independent verification within each specific project context.

This Handbook provides guidelines for best practice for interpretation of the requirements contained in ECSS-E-AS-11 and for the implementation of the process of technology readiness assessment for technologies applied to a critical function of an element.

The ECSS-E-AS-11 - "Adoption Notice of ISO 16290 Definition of the Technology Readiness Levels (TRLs) and their criteria of assessment" adopts ISO 16290 with a minimum set of modifications, to allow for reference and for a consistent integration in ECSS system of standards.

TRL is a scale for technology maturity assessment and not a method of technology engineering nor development. TRL is used in R&T&D activities and also in project activities.

For project activities, a technology readiness assessment informs the project manager (until the end of B phase) of the risk when adopting a new technology for a critical function of an element of the system. In the C and D phases TRL is no longer used by the project and the maturity of technology is managed in the critical item list.

For other projects the information of the declared technology maturity can be reused and an assessment of the new project use conditions are considered in the assessment.

In this handbook the three main actors and the respective role of each actor are clearly identified. The three discrete actors are: technology developers, projects teams (using the technology) and the TRA participants (i.e. those who perform the technology readiness assessment).

1 Scope

The present handbook is provided to support the implementation of the requirements of ECSS-E-AS-11 to space projects.

With this purpose, this handbook provides guidelines on the way to assess the maturity of a technology of a product in a given environment, to use the TRL assessment outcome in the product development framework, and to introduce some further refinements for specific disciplines or products to which the TRL assessment methodology can be extended.

The concept of Manufacturing Readiness Level (MRL) is not addressed in this document, whilst the concept of TRL can be applied to the technology-related aspects of manufacturing.