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SLOVENSKI STANDARD
SIST EN 50126-1:2018/oprA1:2023

01-april-2023

Železniške naprave - Specifikacija in prikaz zanesljivosti, razpoložljivosti, vzdrževalnosti in varnosti (RAMS) - 1. del: Generični procesi RAMS - Dopolnilo A1

Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process

Bahnanwendungen - Spezifikation und Nachweis von Zuverlässigkeit, Verfügbarkeit, Instandhaltbarkeit und Sicherheit (RAMS) - Teil 1: Generischer RAMS-Prozess

Applications ferroviaires - Spécification et démonstration de la fiabilité, de la disponibilité, de la maintenabilité et de la sécurité (FDMS) - Partie 1 : Processus FMDS générique

Ta slovenski standard je istoveten z: **EN 50126-1:2017/prA1**

ICS:

03.120.01	Kakovost na splošno	Quality in general
45.020	Železniška tehnika na splošno	Railway engineering in general

SIST EN 50126-1:2018/oprA1:2023 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**DRAFT
EN 50126-1:2017**

prA1

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ICS 29.280; 45.020

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English Version

Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process

Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process

Bahnanwendungen - Spezifikation und Nachweis von Zuverlässigkeit, Verfügbarkeit, Instandhaltbarkeit und Sicherheit (RAMS) - Teil 1: Generischer RAMS-Prozess

This draft amendment prA1, if approved, will modify the European Standard EN 50126-1:2017; it is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2023-04-28.

It has been drawn up by CLC/TC 9X.

If this draft becomes an amendment, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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

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

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Project: 72022

Ref. No. EN 50126-1:2017/prA1 E

Contents

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European foreword

This document (EN 50126-1:2017/prA1:2023) has been prepared by Technical Committee CLC/TC 9X "Electrical and electronic applications for railways", the secretariat of which is held by France.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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For relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of this document.

1 Modification to references

Throughout the text replace EN 50126-2 with EN 50126-2:2017[1], and EN 50126-2:2017 with EN 50126-2:2017[1].

2 Modification to Clause 2, "Normative References"

Add the following text:

"The following document, in whole or in part, is normatively referenced in this document and is indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50126-2:2017,[1] *Railway Applications — The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) — Part 2: Systems Approach to Safety*

3 Modification to Clause 3, "Terms and definitions "

In all subclauses, replace the following text:

"[SOURCE: IEC 60050-821:FDIS2016]"

with the following text:

"[SOURCE: IEC 60050-821:2017] "

Replace the following text:

"**3.2**
accident
unintended event or series of events that results in death, injury, loss of a system or service, or environmental damage

[SOURCE: IEC 60050-821: FDIS2016, 821-12-02]"

with the following text:

"**3.2**
accident
unintended event or series of events that results in harm

[SOURCE: IEC 60050-821:2017, 821-12-02, modified – "that results in death, injury, loss of a system or service, or environmental damage" has been replaced with "that results in harm]"

Replace the following text:

"**3.5**
audit
systematic, independent, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled

Note 1 to entry: Whilst "audit" applies to management systems, "assessment" applies to conformity assessment bodies as well as more generally.

[SOURCE: EN ISO/IEC 17000:2004, 4.4, modified – The references to other terms within ISO/IEC 17000 have been replaced by hyperlinks to entries in the IEV.]

[SOURCE: IEC 60050-902:2013, 902-03-04]"

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[1] As amended by EN 50126-2:2017/prA1:2023.

with the following text:

"**3.5**
audit

systematic, independent, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled

[SOURCE: IEC 60050-902:2013, 902-03-04, modified – The note 1 to entry has been omitted]"

Replace the following text:

"**3.6**
availability, <of a product>

ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

[SOURCE: IEC 60050-821: FDIS2016, 821-05-82, modified]"

with the following text:

"**3.6**
availability, < for railways RAMS >

ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

[SOURCE: IEC 60050-821:2017, 821-05-82, modified – "of a product" has been changed with "for railways RAMS"]"

Replace the following text:

"**3.7**
basic integrity

integrity attribute for safety related function with a TFFR higher than (less demanding) 10^{-5} [h^{-1}] or non-safety-related function"

with the following text:

"**3.7**
basic integrity

integrity attribute for a safety-related function with a TFFR of 10^{-5} [h^{-1}] or higher (less demanding) or for a non-safety-related function"

Replace the following text:

"**3.10**
common cause failure

failures of multiple items, which would otherwise be considered independent of one another, resulting from a single cause

[SOURCE: IEC 60050-192:2015, 192-03-18]"

with the following text:

"**3.10**
common cause failures, pl

failures of multiple items, which would otherwise be considered independent of one another, resulting from a single cause

EN 50126-1:2017/prA1:2023 (E)

Note 1 to entry: Common cause failures can also be "common mode failures".

Note 2 to entry: The potential for common cause failures reduces the effectiveness of system redundancy.

[SOURCE: IEC 60050-192:2015; 192-03-18]"

Replace the following text:

"**3.21**
failure, <of an item>

loss of ability to perform as required

Note 1 to entry: Qualifiers, such as catastrophic, critical, major, minor, marginal and insignificant, may be used to categorize failures according to the severity of consequences, the choice and definitions of severity criteria depending upon the field of application.

Note 2 to entry: Qualifiers, such as misuse, mishandling and weakness, may be used to categorize failures according to the cause of failure.

[SOURCE: IEC 60050-192:2015, 192-03-01, modified Note 1 to entry has been omitted]

[SOURCE: IEC 60050-821:FDIS2016, 821-11-19]

Note 3 to entry: "Failure" is an event, as distinguished from "fault", which is a state."

with the following text:

"**3.21**
failure, <of an item> iTeh STANDARD PREVIEW

loss of ability to perform as required (standards.iteh.ai)

Note 1 to entry: Qualifiers, such as catastrophic, critical, major, minor, marginal and insignificant, may be used to categorize failures according to the severity of consequences, the choice and definitions of severity criteria depending upon the field of application.

Note 2 to entry: Qualifiers, such as misuse, mishandling and weakness, may be used to categorize failures according to the cause of failure.

Note 3 to entry: "Failure" is an event, as distinguished from "fault", which is a state.

Note 4 to entry: inability to perform a function during maintenance activities needs not to be considered.

[SOURCE: IEC 60050-821:2017, 821-11-19 modified, added Note 3 and Note 4 to entry]"

Replace the following text:

"**3.23**
failure rate

limit of the ratio of the conditional probability that the instant of time, T, of a failure of a product falls within a given time interval (t, t + Δt) and the duration of this interval, Δt, when Δt tends towards zero, given that the item is in an up state at the start of the time interval

Note 1 to entry: For applications where distance travelled or number of cycles of operation is more relevant than time then the unit of time can be replaced by the unit of distance or cycles, as appropriate.

Note 2 to entry: The term "failure rate" is often used in the sense of "mean failure rate" defined in IEV 192-05-07.

[SOURCE: IEC 60050-821:FDIS2016]"

with the following text:

"**3.23**
failure rate

limit of the ratio of the conditional probability that the instant of time, T, of a failure of a product falls within a given time interval (t, t + Δt) and the duration of this interval, Δt, when Δt tends towards zero, given that the item is in an up state at the start of the time interval

Note 1 to entry: For applications where distance travelled or number of cycles of operation is more relevant than time then the unit of time can be replaced by the unit of distance or cycles, as appropriate.

Note 2 to entry: The term "failure rate" is often used in the sense of "mean failure rate" defined in IEV 192-05-07.

[SOURCE: IEC 60050-821:2017, 821-12-21]"

Replace the following text:

"**3.25**
function, <of an item>

specified action or activity which can be performed by technical means and/or human beings and has a defined output in response to a defined input

Note 1 to entry: A function can be specified or described without reference to the physical means of achieving it.

[SOURCE: IEC 60050-821:FDIS2016, 821-12-25, modified]"

with the following text:

"**3.25**
function, <of an item>

specified action or activity which can be performed by technical means and/or human beings and has a defined output in response to a defined input

Note 1 to entry: A function can be specified or described without reference to the physical means of achieving it."

Replace the following text:

"**3.27**
generic product

product independent of applications, fulfilling predefined boundary conditions, interfaces and functionality (black box)

EXAMPLE: Examples point machines, axle counters, real-time operating systems, fail-safe computer platform without application software.

[SOURCE: IEC 60050-821:FDIS2016, 821-01-57]"

with the following text:

"**3.27**
generic product

product independent of applications, fulfilling predefined boundary conditions, interfaces and functionality

EXAMPLE: Examples include point machines, axle counters, real-time operating systems, fail-safe computer platform without application software.

[SOURCE: IEC 60050-821:2017, 821-01-57, modified – removed "(blackbox)"]"

Replace the following text:

"**3.30**
hazard log

document in which hazards identified, decisions made, solutions adopted and their implementation status are recorded or referenced

[SOURCE: IEC 60050-821:FDIS2016, 821-12-27]"

with the following text:

"**3.30**
hazard log

document in which hazards identified, decisions made, solutions adopted and their implementation status are recorded or referenced

[SOURCE: IEC 60050-821:2017, 821-12-27]"

Replace the following text:

"**3.37**
maintainability, <of an item>

ability to be retained in, or restored to, a state to perform as required, under given conditions of use and maintenance

Note 1 to entry: Given conditions would include aspects that affect maintainability, such as: location for maintenance, accessibility, maintenance procedures and maintenance resources.

[SOURCE: IEC 60050-192:2015, 192-01-27]"

with the following text:

"**3.37**
maintainability, <of an item>

ability to be retained in, or restored to, a state to perform as required, under given conditions of use and maintenance

Note 1 to entry: Given conditions would include aspects that affect maintainability, such as: location for maintenance, accessibility, maintenance procedures and maintenance resources.

[SOURCE: IEC 60050-192:2015, 192-01-27, modified – The note 2 to entry has been omitted.]"

Replace the following text:

"**3.51**
random failure

unpredictable failure which results from one or more of the possible degradation mechanisms"

with the following text:

"**3.51**
random failure

failure that occurs randomly in time

[SOURCE: IEC 60050-821:2017, 821-11-38]"

Replace the following text:

"**3.57**
risk, <for railway RAMS>

combination of expected frequency of loss and the expected degree of severity of that loss"

with the following text:

"**3.57**
risk, <for railway RAMS>