**SLOVENSKI STANDARD**

# oSIST prEN 50126-2:2015

**01-november-2015**

**Železniške naprave - Specifikacija in prikaz zanesljivosti, razpoložljivosti, vzdrževalnosti in varnosti (RAMS) - 2. del: Sistemski pristop k varnosti**

Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 2: Systems Approach to Safety

Bahnanwendungen - Spezifikation und Nachweis von Zuverlässigkeit, Verfügbarkeit, Instandhaltbarkeit und Sicherheit (RAMS) - Teil 2: Systembezogene Sicherheitsmethodik

Applications ferroviaires - Spécification et démonstration de la fiabilité, de la disponibilité, de la maintenabilité et de la sécurité (FDMS) - Partie 2: Approche systématique pour la sécurité

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/19147e51-f237-4aa1-9414-54215a98e782/sist-en-50126-2-2018

**Ta slovenski standard je istoveten z: prEN 50126-2:2015**

**ICS:**

| | | |
|---|---|---|
| 45.020 | Železniška tehnika na splošno | Railway engineering in general |

**oSIST prEN 50126-2:2015 en,fr,de**

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

oSIST prEN 50126-2:2015

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**DRAFT**
**prEN 50126-2**

August 2015

ICS 45.020

Will supersede CLC/TR 50126-2:2007

English Version

# Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 2: Systems Approach to Safety

Applications ferroviaires - Spécification et démonstration de la fiabilité, de la disponibilité, de la maintenabilité et de la sécurité (FDMS) - Partie 2: Approche systématique pour la sécurité

Bahnanwendungen - Spezifikation und Nachweis von Zuverlässigkeit, Verfügbarkeit, Instandhaltbarkeit und Sicherheit (RAMS) - Teil 2: Systembezogene Sicherheitsmethodik

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2015-12-04.

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

If this draft becomes a European Standard, 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.

This draft European Standard 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.

oSIST prEN 50126-2:2015
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

© 2015 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Project: 60237

Ref. No. prEN 50126-2:2015 E

oSIST prEN 50126-2:2015



# Contents

Page



iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

oSIST prEN 50126-2:2015





iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018

oSIST prEN 50126-2:2015





iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

oSIST prEN 50126-2:2015



# European foreword

This document (prEN 50126-2:2015) has been prepared by CLC/TC 9X "Electrical and electronic applications for railways".

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 will supersede CLC/TR 50126-2:2007.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

EN 50126 "*Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)*" consists of the following parts:

– Part 1: Generic RAMS process;

– Part 2: Systems approach to safety;

SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

oSIST prEN 50126-2:2015



# Introduction

EN 50126-1:1999 was aimed at introduce the application of a systematic RAMS management process in the railway sector. Through the application of these standards and the experiences gained over the last years, the need for revision and restructuring became apparent with a need to deliver a systematic and coherent approach to RAMS applicable to all the railway application fields Signalling, Rolling Stock and Electric power supply for Railways (Fixed Installations).

The revision work improved the coherency and consistency of the standards, the concept of safety management and the practical usage of EN 50126 and took into consideration the existing and related Technical Reports as well.

This European Standard provides railway duty holders and the railway suppliers, throughout the European Union, with a process which will enable the implementation of a consistent approach to the management of reliability, availability, maintainability and safety, denoted by the acronym RAMS.

Processes for the specification and demonstration of RAMS requirements are cornerstones of this standard. This European Standard promotes a common understanding and approach to the management of RAMS.

EN 50126 is the railway sector specific application of IEC 61508. Meeting the requirements in this European Standard is sufficient to ensure that additional compliance to IEC 61508 does not need to be demonstrated.

iTeh STANDARD PREVIEW (standards.iteh.ai)

With regard to safety EN 50126-1 provides a Safety Management Process which is supported by guidance and methods described in EN 50126-2.

EN 50126-1 and EN 50126-2 are independent from the technology used. As far as safety is concerned, EN 50126 takes the perspective of functional safety. This does not exclude other aspects of safety. However, these are not the focus.

The application of this standard should be adapted to the specific requirements of the system under consideration.

https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-

This European Standard can be applied systematically by the railway duty holders and railway suppliers, throughout all phases of the life-cycle of a railway application, to develop railway specific RAMS requirements and to achieve compliance with these requirements. The systems-level approach developed by this European Standard facilitates assessment of the RAMS interactions between elements of railway applications even if they are of complex nature.

This European Standard promotes co-operation between the stakeholders of Railways in the achievement of an optimal combination of RAMS and cost for railway applications. Adoption of this European Standard will support the principles of the European Single Market and facilitate European railway inter-operability.

The process defined by this European Standard assumes that railway duty holders and railway suppliers have business-level policies addressing Quality, Performance and Safety. The approach defined in this standard is consistent with the application of quality management requirements contained within the ISO 9001.

In accordance with CENELEC editing rules [1)], mandatory requirements in this standard are indicated with the modal verb “shall”. Where justifiable, the standard permits process tailoring.

Specific guidance on the application of this standard for Safety aspects is provided in EN 50126-2. EN 50126-2 provides various methods for use in the safety management process. Where a particular method is selected for the system under consideration, the mandatory requirements of this method are by consequence mandatory for the safety management of the system under consideration.

---

1) CENELEC “Internal Regulations Part 3: Rules for the structure and drafting of CEN/CENELEC Publications (2009-08), Annex H

# 1 Scope

This part 2 of EN 50126

- considers RAMS, understood as reliability, availability, maintainability and safety and their interaction;
- considers the generic aspects of the RAMS life-cycle. The guidance in this part is still applicable in the application of specific standards;
- defines:
  - a process, based on the system life-cycle and tasks within it, for managing RAMS;
  - a systematic process, tailorable to the type and size of system under consideration, for specifying requirements for RAMS and demonstrating that these requirements are achieved;
- addresses railway specifics;
- enables conflicts between RAMS elements to be controlled and managed effectively;
- does not define:
  - RAMS targets, quantities, requirements or solutions for specific railway applications;
  - rules or processes pertaining to the certification of railway products against the requirements of this standard;
  - an approval process by the safety authority;
- does not specify requirements for ensuring system security.

This part 2 of EN 50126 is applicable

- to the specification and demonstration of RAMS for all railway applications and at all levels of such an application, as appropriate, from complete railway systems to major systems and to individual and combined sub-systems and components within these major systems, including those containing software; in particular:
  - to new systems;
  - to new systems integrated into existing systems accepted prior to the creation of this standard, but only to the extent and insofar as the new system with the new functionality is being integrated. It is otherwise not applicable to any unmodified aspects of the existing system;
  - as far as reasonably practicable, to modifications and extensions of existing systems accepted prior to the creation of this standard, but only to the extent and insofar as existing systems are being modified. It is otherwise not applicable to any unmodified aspect of the existing system;
- at all relevant phases of the life-cycle of an application;
- for use by railway duty holders and the railway suppliers.

It is not required to apply this standard to existing systems including those systems already compliant with any version of former EN 50126, which remain unmodified. Railway applications means Command, Control & Signalling, Rolling Stock and Fixed Installations.

Processes for the specification and demonstration of RAMS requirements are cornerstones of this standard. This European Standard promotes a common understanding and approach to the management of RAMS.

The process defined by this European Standard assumes that railway duty holders and railway suppliers have business-level policies addressing Quality, Performance and Safety. The approach defined in this standard is consistent with the application of quality management requirements contained within the EN ISO 9001.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018

oSIST prEN 50126-2:2015



# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are 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.

prEN 50126-1:2015, *Railway applications – The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 1: Generic RAMS process*

# 3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 50126-1:2015 apply.

# 4 Abbreviations

| | |
|---|---|
| ALARP | As Low As Reasonable Practicable |
| CBA | Cost Benefit Analysis |
| CCF | Common Cause Failure (Analysis) |
| CoP | Code of Practice |
| DRA | Differential Risk Aversion |
| ERE | Explicit Risk Estimation |
| EMC | Electromagnetic compatibility |
| ETA | Event Tree Analysis |
| FMECA | Failure Mode Effect & Criticality Analysis |
| FTA | Fault Tree Analysis |
| GA, GASC | Generic Application, Generic Application Safety Case |
| GP, GPSC | Generic Product, Generic Product Safety Case |
| GAME | Globalement Au Moins Equivalent |
| HAZOP | Hazard and Operability study |
| ISA | Independent Safety Assessment |
| MEM | Minimum Endogenous Mortality |
| RAC | Risk Acceptance Criterion |
| RAMS | Reliability, Availability, Maintainability, Safety |
| RBD | Reliability Block Diagram |
| RRA | Rapid Ranking Analysis |
| SA, SASC | Specific Application, Specific Application Safety Case |
| SDR | Safe Down Rate |
| SDT | Safe Down Time |
| SIL | Safety Integrity Level |
| SRAC | Safety-related Application Conditions |
| TFFR | Tolerable Functional unsafe Failure Rate |
| THR | Tolerable Hazard Rate |
| VPF | Value of Preventing a Fatality |

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

# 5 Guidance on Safety process

## 5.1 Risk Assessment and Hazard Control

In this subclause, the so-called Hourglass Model is introduced: it offers a simplified approach that although not containing all aspects implied in the life-cycle model helps to clarify some issues.

oSIST prEN 50126-2:2015



The Hourglass Model provides an overview of the major safety-related activities that are needed to ensure an acceptable safety level for a technical system, including the corresponding responsibility areas.

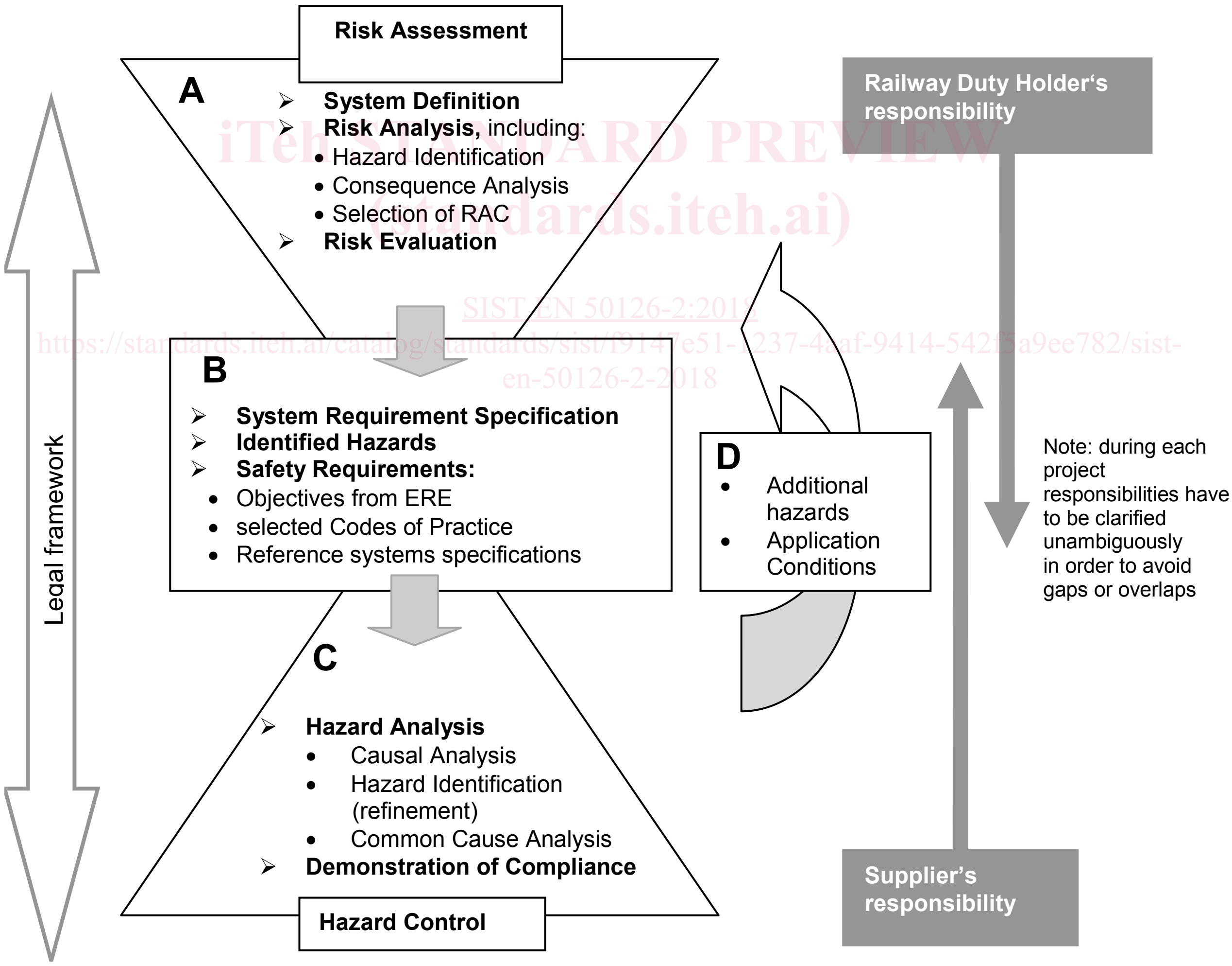
Technical system means a product or an assembly of products including the design, implementation and support documentation. The development of a technical system starts with its requirements specification and ends with its acceptance. The design of relevant interfaces with human behaviour is considered, while human operators and their actions are not included in a technical system. Both the maintenance process (described in the maintenance manuals) and the operation are specified but are not considered parts of the technical system itself. They can be restricted in “application conditions”.

The purpose of this model is to highlight the separation between risk analysis (at the railway system level) from hazard analysis (at the level of the system under consideration).

This enhances co-operation between the relevant stakeholders, clarifying responsibilities and interfaces and has the advantages of reducing complexity and facilitating modularization.

The Hourglass Model describes two main aspects:

- “risk assessment”, i.e. deriving high-level safety requirements for operational and technical issues (including maintenance), and
- “hazard control”, i.e. design and implementation of the safety-related system under consideration by determining and analysing causes internal to the system and implementing control measures on the basis of the given safety requirements.




iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-5422a9ee782/sist-en-50126-2-2018

**Figure 1 – The Hourglass Model**

## 5.2 A. Risk Assessment

### 5.2.1 General

Risk assessment is performed at the railway system level.

oSIST prEN 50126-2:2015



It relies on System Definition and includes Risk analysis and Risk evaluation.

It defines the high level system safety requirements, in particular safety requirements for the system under consideration from the perspective of operator. It takes into account safety-related operational aspects, previous experience and the regulatory requirements of the railway application.

The main task for this activity is the risk analysis, which is derived from the system definition. The risk analysis includes hazard identification, consequence analysis, and selection of Risk Acceptance Criterion (RAC).

The specification of safety requirements is the final result of risk assessment; in Figure 1 it is allocated to box B, because it has an interface purpose (together with system requirement specifications and the list of identified hazards) between different responsibilities.

#### 5.2.2 Gaining and sharing system knowledge

All the knowledge gained during the process and the documented analyses, resulting from the risk assessment, should be considered as relevant information together with the specification of safety requirements.

This knowledge should be shared and distributed among the relevant stakeholders involved in the lifecycle of the system. It will provide significant potential benefits in terms of improved awareness of hazards and risk of accidents in the given operational and maintenance context, and will also help to understand the scope and limits of the risk reduction measures.

#### 5.2.3 Conducting risk assessment

The level of detail in a risk assessment should be adequate to the risk. The purpose is not to catalogue every trivial hazard, nor is it expected that hazards beyond the limits of current knowledge will always be identified. A suitable and sufficient risk assessment should reflect a reasonable analysis of hazards and their associated risks within the railway operation and within the applied technology itself. Where reasonably practicable, risk assessments should be correlated with historical records of accidents and the records of causes.

iTeh STANDARD PREVIEW (standards.iteh.ai)

When possible, consideration of technical implementation/architecture should be avoided in this first stage i.e. the system to be developed should be considered as a black box, of which functions and hazards are evaluated only at the boundaries. These boundaries are well defined interfaces between the operational environment and the system under consideration.

As an example, an “unintentional train motion” is a hazard for a train. It can be observed as an abstraction at the boundary of the “system train” and it could lead to different accidents depending on the operational context (e.g. collision in context with over-speeding while running or fall of persons in connection with a train moving in a station while expected to stand still, etc.).

Assumptions defined during the risk assessment have to be checked and updated throughout the life-cycle phases.

### 5.3 B. Outcome of the risk assessment

The results of the risk assessment are a set of safety requirements associated to clearly-identified functions, systems or operating rules. They are part of the System Requirement Specification that establishes the technical interface between the stakeholders.

NOTE The project organisational structure and responsibilities are another factor to consider in understanding and controlling risk. For organisational aspects and requirements refer to 7.2 .

On the basis of the selected risk acceptance principles, safety requirements can refer to Codes of Practice, to Similar Systems, or give explicit targets derived from an Explicit Risk Estimation (ERE).

Safety requirements include required efficiency of safety functions, that could be assessed quantitatively (e.g. maximum rates of hazards), semi-quantitatively or qualitatively (e.g. use of trained drivers for controlling human factor errors).

Safety requirements should be assessed with a holistic approach, i.e. the residual risk should be evaluated as acceptable taking into consideration the identified hazards.

### 5.4 C. Hazard control

The hazard control stage in the hourglass model is dedicated to ensuring that the system under consideration is compliant with the safety requirements. Hazard control is performed for a specific system architecture.

oSIST prEN 50126-2:2015



NOTE Hazard control as here defined has a narrow meaning and is limited to the design and implementation phase.

The major impacts of human factors, operational and general maintenance rules as well as procedures are part of the preceding risk analysis and should have already been taken into account in the safety requirements. Therefore, during hazard control, the designer of the system under consideration can focus on the internal causes of the identified hazards.

The main task for this activity is the “hazard analysis” comprising:

- causal analysis;
- a dedicated hazard identification focusing on the system under consideration;
- a Common Cause Analysis.

Hazard identification is a recurring task that can appear on several iteration levels for subsets of the system under consideration. In order to distinguish these different tasks (and related documents) the hazard identification has been quoted twice in Figure 1:

1. during risk assessment, hazard identification focuses on high level hazards derived from the system functions (black box) and related operation of the system as well as its environment;
2. within the hazard control, a refined/iterated hazard identification focuses on hazards and their causes derived from the technical solutions, i.e. from defined architecture and internal interfaces of the system under consideration, and potential new hazards introduced by the system itself.

Figure 2 shows the general case where the cause of a hazard at the railway system level consists in a hazard on the level of the system under consideration, with respect to its boundary. The boundary for a hazard identification is always given in the system definition that limits the scope of the task. This implies that the hazards are structured hierarchically. Hence a hierarchical approach to hazard analysis and hazard logging should be used.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147851-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018

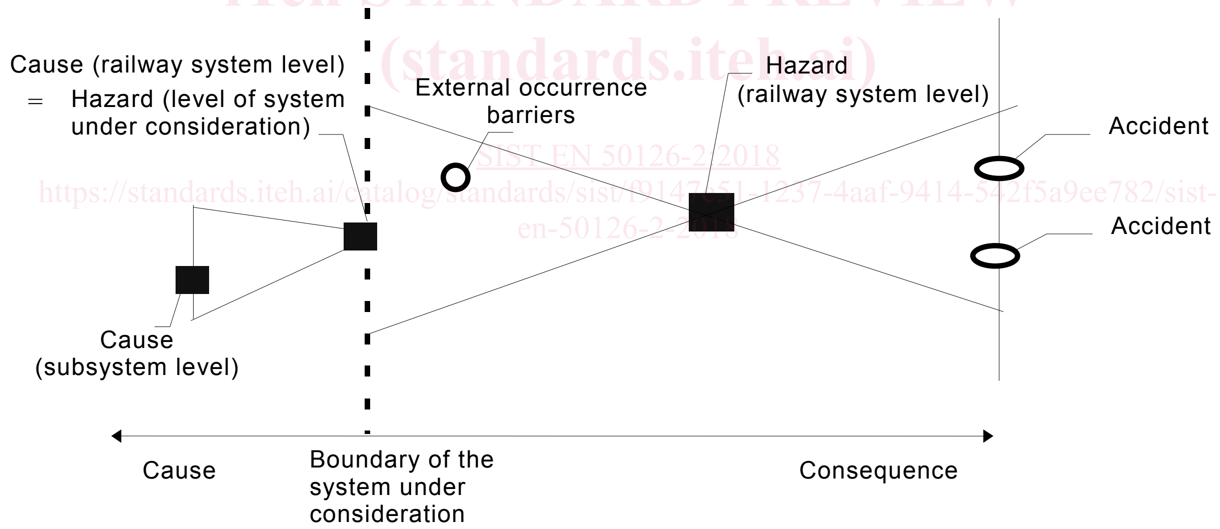



**Figure 2 – Definition of hazards with respect to the system boundary**

The picture is hazard-oriented and shows a “bow-tie” shape, suggesting that several causes may lead to the same hazard and one hazard may lead to several different accidents.

The demonstration of compliance with the safety requirements of the system under consideration can be performed in various forms. These forms depend on the nature of the underlying requirements set at the beginning of the hazard control.

## 5.5 D. Revision of Risk Assessment

During the hazard control stage, fulfilment of safety targets could not be reached at the first iteration:

- additional hazards may be identified at the level of the system under consideration;
- a need of new operational rules may arise;

oSIST prEN 50126-2:2015



– additional external safety measures may be required to fulfil the safety objectives.

In all these cases, a revision of the risk assessment is necessary.

This revision should also take account of the application conditions that could arise at the level of the system under consideration.

### 5.6 Responsibilities

Risk assessment is mainly within the responsibility of the railway duty holders and operators.

The roles and responsibilities may however be contracted to other parties in relation to their accountabilities, provided that they have a documented and suitable range of competencies to consider the whole operational context in detail. They need to take into account safety-related operational aspects, previous experience and regulatory requirements. In any case the railway duty holders should approve the results of the risk assessment.

The hazard control, for hazards associated purely with the technical system, is the responsibility of the supplier of the technical system.

Railway duty holder and supplier need to comply with the prevailing legal requirements.

## 6 Guidance on Safety Demonstration and Acceptance

### 6.1 Introduction

This clause defines the safety acceptance and approval process for the system under consideration. Except where considered appropriate, it does not specify who should carry out the work at each stage, since this may vary in different circumstances.

In terms of safety processes, the development of a system can be classified in three types:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

- Generic Product: The system is considered from a generic point of view, applicable to different classes of applications;

  Analyses are carried out within an operational context which is application-independent. The safety process is typically completed with Phase 6 (Design & Implementation).
- Generic Application: The system is considered suitable for multiple applications of the same class;

  Analyses are carried out within an operational context which is application-dependent. The safety process is typically completed within Phase 6 (Design & Implementation) and includes the definition of the application design process.
- Specific application: The system is considered for a specific application (including its physical implementation).

SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-

Three conditions shall be satisfied before the system under consideration can be accepted as adequately safe for its intended application:

- evidence of quality management;
- evidence of safety management;
- evidence of functional and technical safety.

The evidence of quality management, safety management and functional/technical safety are included in the safety case.

Three different categories of Safety Case can be defined according to the involved type of development as previously defined.

### 6.2 Safety acceptance process

Before system acceptance can be considered, an Independent Safety Assessment (ISA) of the system under consideration with related safety case should be carried out, to provide assurance that the necessary level of safety has been achieved.

Its results should be presented in an ISA Report. The report should explain the activities carried out by the Safety Assessor to determine wheter the system under consideration has been designed to meet its specified requirements, and if necessary specify some additional conditions for its operation.

oSIST prEN 50126-2:2015



The overall documentary evidence should consist in:

- the system (or sub-system/component) requirements specification;
- the safety requirements specification (and related Risk Analysis whenever applicable);
- the safety case, including
  - Part 1: Definition of system/sub-system/component;
  - Part 2: Quality Management report (evidence of quality management);
  - Part 3: Safety Management Report (evidence of safety management);
  - Part 4: Technical Safety Report (evidence of functional/technical safety);
  - Part 5: Related Safety Cases (if applicable);
  - Part 6: Conclusion.
- the Independent Safety Assessment (ISA) Report, if appropriate.

Provided all the conditions for safety acceptance have been satisfied, as demonstrated by the Safety Case, and subject to the results of the independent safety assessment where necessary, the system under consideration may be granted safety acceptance by the stakeholders responsible for its incorporation or final use. Acceptance may be subject to the fulfilment of additional conditions imposed by the legal framework.

When using a Generic Product (i.e. independent of application), or a Generic Application (i.e. class of application) in the context of a Specific Application, it should be possible for safety acceptance to be based on existing related independent safety assessment (i.e. cross-acceptance). This is not considered possible for Specific Applications.

The safety acceptance process, for all three categories of Safety Case, is illustrated in Figure 3, where for the Specific Application cases of reference to either Generic Products or to Generic Application are provided.

According to tailoring requirements defined in Part 1, the stakeholder responsible for a given safety process shall provide evidence and justification of the coverage and limits of the covered life-cycle phases.

NOTE The shaded area in Figure 3 relates to life-cycle phases 1-3, meaning that this life-cycle phases are generally covered with different level of extent in Generic Product and Generic / Specific Application. Assumptions shall be justified in the associated Safety Cases.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 50126-2:2018
https://standards.iteh.ai/catalog/standards/sist/f9147e51-1237-4aaf-9414-542f5a9ee782/sist-en-50126-2-2018