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Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 2: Safety assurance

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

This Technical Report was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to vote in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 (simple majority) and was approved by CENELEC as CLC/TR 50506-2 on 2009-07-17.

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Introduction

EN 50129 was developed in CENELEC and is now regularly called up in specifications. In essence, it lists factors that influence RAMS (see EN 50126-1) and adopts a broad risk-management approach to safety. EN 50129 is the basic standard for safety related electronic systems for signalling.

Use of EN 50129 has enhanced the general understanding of the issues, but also showed, that items like Safe Design, Safety Documents and Reports, Safety Assessment and Approval, and Cross-Acceptance need further explanation and clarification. Therefore CENELEC decided to address those items in this Application Guideline. The Cross Acceptance is included in CLC/TR 50506-1.

1 Scope

This document is a Technical Report about the basic standard. It is applicable to the same systems and addresses the same audience as the standard itself. It enhances information on specific items on the application of EN 50129. The following items are covered, within the scope of this Application Guideline of EN 50129, as follows:

- Clause 4 deals with identification and mitigation of failures in the concept, specification and design phases. It is mainly dedicated to designers and verifiers and product safety engineers;
- Clause 5 deals with the preparation of a safety case, enhancing points providing the required evidence for safety assessment and approval. It is mainly dedicated to verifiers, validators, safety managers, quality managers and safety engineers;
- Clause 6 deals with the activities an Independent Safety Assessor has to carry out. It is mainly dedicated to safety assessors, safety authorities, safety managers and safety approvals.

In drafting this guidance, it is assumed that the reader is familiar with the basic structure of the standard.

This document does not claim to be exhaustive. It is not a complete compilation of best practices, but only the translation of the knowledge of all the experts of the Working Group in charge of composition of this Application Guideline.

2 References

This Application Guideline uses as basis for specific topics the following reference standards, already mentioned in the main EN 50129.

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CLC/TR 50506-1, *Railway applications – Communication, signalling and processing systems – Application Guide for EN 50129 – Part 1: Cross-acceptance*

EN 45004 [1], *General criteria for the operation of various types of bodies performing inspection*

EN 50121 series, *Railway applications – Electromagnetic compatibility*

EN 50121-4, *Railway applications – Electromagnetic compatibility – Part 4: Emission and immunity of the signalling and telecommunications apparatus*

EN 50124-1, *Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment*

EN 50125-1, *Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock*

EN 50125-2, *Railway applications – Environmental conditions for equipment – Part 2: Fixed electrical installations*

EN 50125-3, *Railway applications – Environmental conditions for equipment – Part 3: Equipment for signalling and telecommunications*

[1] Superseded by EN ISO/IEC 17020:2004, *General criteria for the operation of various types of bodies performing inspection* (ISO/IEC 17020:1998).

EN 50126-1:1999 + corr. May 2006, *Railway Applications – The specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 1: Basic requirements and generic process*

EN 50128, *Railway applications – Communication, signalling and processing systems – Software for railway control and protection systems*

EN 50129:2003, *Railway applications – Communication, signalling and processing systems – Safety related electronic systems for signalling*

EN 50155, *Railway applications – Electronic equipment used on rolling stock*

EN 50159-1, *Railway applications – Communication, signalling and processing systems – Part 1: Safety related communication in closed transmission systems*

EN 50159-2, *Railway applications – Communication, signalling and processing systems – Part 2: Safety related communication in open transmission systems*

EN 61508 series, *Functional safety of electrical/electronic/programmable electronic safety-related systems* (IEC 61508 series)

EN ISO 9001:2000 [2], *Quality Management Systems – Requirements* (ISO 9001:2000)

ESA PSS 01-403, *Hazard Analysis and Safety Risk Assessment*

ISO/IEC Guide 73:2002, *Risk management – Vocabulary – Guidelines for use in standards*

The following standard is mentioned as complementary source of information:

EN ISO/IEC 17020 (former EN 45004), *General criteria for the operation of various types of bodies performing inspection* (ISO/IEC 17020)

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50126-1:1999, EN 50128:2001, EN 50129:2003 and the following apply.

3.1.1
generic application
system with specific functions that are related to “a category of applications” associated with a general environmental and operational context, which is developed on the basis of criteria of standardization and parameterization of its elements, so as to render it serviceable for various tangible applications. By combining generic products or combining these with other generic applications, it is possible to obtain a new generic application

3.1.2
generic product
component or product capable of performing certain functions, with specific performance level, in the environmental and operational conditions stated in the reference specifications. It can be combined with other products and Generic Applications to form other generic applications

[2] Superseded by EN ISO 9001:2008, *Quality management systems – Requirements* (ISO 9001:2008).