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Railway Applications – Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS)

(IEC 62278:2002, IDT)

轨道交通 可靠性、可用性、可维修性和安全性规范及示例

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Foreword

This Standard equivalently adopts IEC 62278:2002 *Railway Applications – Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS)* (English version).

This Standard equivalently translates IEC 62278:2002.

For the benefit of use, this Standard makes the following editorial modifications:

a) Modify “this International Standard” into “this Standard”;

b) Delete the foreword of the international standard.

The Annex A, B, C, D, E in this Standard are informative.

This Standard was proposed by and shall be under the jurisdiction of National Technical Committee for Standardization of Traction Electrical Equipment and System.

Drafting organizations of this Standard: Zhuzhou CSR Times Electric Co., Ltd., CSR Sifang Locomotives & Rolling Stock Co., Ltd., CSR Zhuzhou Electric Locomotive Co., Ltd., China Railway Electrification Survey Design & Research Institute, Tongji University, and Ministry of Railways – Research Institute of Standard and Metrology.

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Railway Applications – Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS)

1 Scope

This Standard defines RAMS in terms of reliability, availability, maintainability and safety and their interaction; defines a process, based on the system life cycle and tasks within it, for managing RAMS; enables conflicts between RAMS elements to be controlled and managed effectively.

This Standard does not define RAMS targets, quantities, requirements or solutions for specific railway applications; does not specify requirements for ensuring system security; all of which shall be specified in the RAMS sub-standards of various specific applications.

This Standard is applicable to:

a) To the specification and demonstration of RAMS for all railway applications and at all levels of such an application, as appropriate, from complete railway routes to major systems within a railway route, 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 in operation prior to the creation of this standard, although it is not generally applicable to other aspects of the existing system,
- To upgrading of existing systems in operation prior to the creation of this standard; although it is not generally applicable to other aspects of the existing system;

b) At all relevant phases of the life cycle of an application;

c) For use by Railway Authorities and railway support industry.

NOTE: Guidance on the applicability is given in the requirements of this standard.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 19001-2000 Quality Management Systems – Requirements (idt ISO 9001:2000)

GB/T 20438 (all parts) Functional Safety of Electrical/Electronic/programmable Electronic Safety – Related Systems [IEC 61508 (all parts), IDT]

IEC 60050 (191):1990 International Electrotechnical Vocabulary (IEV) – Chapter 191: Dependability and Quality of Service

IEC 62279 Railway Applications – Communications, Signalling and Processing Systems – Software for Railway Control and Protection System

EN 50129:2003 Railway Applications – Safety Related Electronic Systems for Signalling

3 Terms and Definitions

For the purposes of this Standard, the following definitions apply.

3.1 Apportionment

Process whereby the RAMS elements for a system are sub-divided between the various items which comprise the system to provide individual targets.

3.2 Assessment

Undertaking of an investigation in order to arrive at a judgement, based on evidence, of the suitability of a product.

3.3 Audit

Systematic and independent examination to determine whether the procedures specific to the requirements of a product comply with the planned arrangements, are implemented effectively and are suitable to achieve the specified objectives.

3.4 Availability

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