



BSI Standards Publication

## Railway applications — Cybersecurity

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## National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/9, Railway Electrotechnical Applications.

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Bahnwendungen - IT-Sicherheit

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<b>Contents</b>	<b>Page</b>
<b>European foreword</b> .....	<b>6</b>
<b>Introduction</b> .....	<b>7</b>
<b>1 Scope</b> .....	<b>8</b>
<b>2 Normative references</b> .....	<b>8</b>
<b>3 Terms, definitions and abbreviations</b> .....	<b>8</b>
3.1 Terms and definitions.....	8
3.2 Abbreviations .....	24
<b>4 Railway system overview</b> .....	<b>26</b>
4.1 Introduction .....	26
4.2 Railway asset model .....	27
4.3 Railway physical architecture model.....	28
4.4 High-level railway zone model .....	29
<b>5 Cybersecurity within a railway application lifecycle</b> .....	<b>31</b>
5.1 Introduction .....	31
5.2 Railway application and product lifecycles .....	31
5.3 Activities, synchronization and deliverables .....	31
5.4 Cybersecurity context and cybersecurity management plan .....	35
5.5 Relationship between cybersecurity and essential functions .....	35
5.5.1 General.....	35
5.5.2 Defence in depth .....	35
5.5.3 Security-related application conditions.....	36
5.5.4 Interfaces between the safety and the cybersecurity processes .....	37
5.6 Cybersecurity assurance process.....	38
<b>6 System definition and initial risk assessment</b> .....	<b>39</b>
6.1 Introduction .....	39
6.2 Identification of the system under consideration .....	40
6.2.1 Definition of the SuC.....	40
6.2.2 Overall functional description .....	41
6.2.3 Access to the SuC .....	41
6.2.4 Essential functions.....	41
6.2.5 Assets supporting the essential functions .....	42
6.2.6 Threat landscape.....	42
6.3 Initial risk assessment .....	42
6.3.1 Impact assessment.....	42
6.3.2 Likelihood assessment.....	43
6.3.3 Risk evaluation .....	44
6.4 Partitioning of the SuC .....	45

6.4.1	Criteria for zones and conduits breakdown.....	45
6.4.2	Process for zones and conduits breakdown .....	45
6.5	Output and documentation .....	46
6.5.1	Description of the system under consideration .....	46
6.5.2	Documentation of the initial risk assessment.....	46
6.5.3	Definition of zones and conduits .....	46
<b>7</b>	<b>Detailed risk assessment .....</b>	<b>47</b>
7.1	General aspects.....	47
7.2	Establishment of cybersecurity requirements.....	48
7.2.1	General.....	48
7.2.2	Threat identification and vulnerability identification.....	49
7.2.3	Vulnerability identification.....	51
7.2.4	Risk acceptance principles.....	51
7.2.5	Derivation of SL-T by explicit risk evaluation .....	53
7.2.6	Determine initial SL .....	55
7.2.7	Determine countermeasures from EN IEC 62443-3-3.....	56
7.2.8	Risk estimation and evaluation .....	56
7.2.9	Determine security level target.....	58
7.2.10	Cybersecurity requirements specification for zones and conduits.....	58
<b>8</b>	<b>Cybersecurity requirements .....</b>	<b>59</b>
8.1	Objectives .....	59
8.2	System security requirements .....	59
8.3	Apportionment of cybersecurity requirements .....	74
8.3.1	Objectives.....	74
8.3.2	Break down of system requirements to subsystem level.....	75
8.3.3	System requirement allocation at component level .....	75
8.3.4	Specific consideration for implementation of cybersecurity requirement on components .....	76
8.3.5	Requirement breakdown structure as verification .....	76
8.3.6	Compensating countermeasures .....	77
<b>9</b>	<b>Cybersecurity assurance and system acceptance for operation .....</b>	<b>78</b>
9.1	Overview .....	78
9.2	Cybersecurity case .....	79
9.3	Cybersecurity verification.....	80
9.3.1	General.....	80
9.3.2	Cybersecurity integration and verification .....	80
9.3.3	Assessment of results .....	82
9.4	Cybersecurity validation.....	82
9.5	Cybersecurity system acceptance .....	83
9.5.1	Independence.....	83
9.5.2	Objectives.....	83
9.5.3	Activities .....	83

9.5.4 Cybersecurity handover .....	83
<b>10 Operational, maintenance and disposal requirements .....</b>	<b>83</b>
10.1 Introduction .....	83
10.2 Vulnerability management .....	84
10.3 Security patch management .....	85
10.3.1 General .....	85
10.3.2 Patching systems while ensuring operational requirements .....	86
<b>Annex A (informative) Handling conduits .....</b>	<b>89</b>
<b>Annex B (informative) Handling legacy systems .....</b>	<b>92</b>
<b>Annex C (informative) Cybersecurity design principles .....</b>	<b>98</b>
<b>Annex D (informative) Safety and security .....</b>	<b>127</b>
<b>Annex E (informative) Risk acceptance methods .....</b>	<b>131</b>
<b>Annex F (informative) Railway architecture and zoning .....</b>	<b>140</b>
<b>Annex G (informative) Cybersecurity deliverables content .....</b>	<b>158</b>
<b>Bibliography .....</b>	<b>161</b>

## Figures

Figure 1 — Segregation of IT and OT .....	27
Figure 2 — Railway asset model (example) .....	28
Figure 3 — Railway physical architecture model (example) .....	29
Figure 4 — Generic high-level railway zone model (example) .....	30
Figure 5 — Defence in depth with example of measures .....	36
Figure 6 — Relationship TRA and SA .....	39
Figure 7 — Initial risk assessment flowchart .....	40
Figure 8 — Detailed risk assessment flowchart .....	49
Figure 9 — Explicit risk evaluation flowchart .....	54
Figure 10 — Handling of SL-C .....	77
Figure 11 — Cybersecurity assurance .....	78
Figure 12 — Cybersecurity case concept .....	79
Figure 13 — Cybersecurity assurance during integration and validation activities .....	81
Figure 14 — General vulnerability handling flowchart .....	85
Figure 15 — Vulnerability and outage time during system update (maintenance phase) [example] .....	87
Figure 16 — Vulnerability and outage time during system update with observation phases [example] .....	88
Figure A.1 — Zones and conduits example .....	90
Figure D.1 — Security as an environmental condition for safety .....	128
Figure F.1 — Adopted generic high-level railway zone model (example) .....	148
Figure F.2 — Example of a railway system zone model .....	149

**Tables**

<b>Table 1 — Security-related activities within a railway application lifecycle (EN 50126-1)</b> .....	<b>32</b>
<b>Table 2 — Examples of function related supporting assets in regard to the defence in depth layers</b> .....	<b>36</b>
<b>Table 3 — Qualitative Impact Assessment example</b> .....	<b>43</b>
<b>Table 4 — Likelihood assessment matrix – Example</b> .....	<b>44</b>
<b>Table 5 — Risk matrix example</b> .....	<b>44</b>
<b>Table 6 — System Security Requirements and Foundational Classes</b> .....	<b>61</b>
<b>Table E.1 — Risk acceptance categories acc. EN 50126-1</b> .....	<b>131</b>
<b>Table E.2 — Mapping severity categories acc. EN 50126-1 to cybersecurity severity</b> .....	<b>132</b>
<b>Table E.3 — Likelihood assessment criteria</b> .....	<b>132</b>
<b>Table E.4 — Mapping Likelihood to accessibility and Probability</b> .....	<b>133</b>
<b>Table E.5 — Impact assessment matrix – Example 2</b> .....	<b>134</b>
<b>Table E.6 — Likelihood assessment matrix – Example 2</b> .....	<b>135</b>
<b>Table E.7 — Risk acceptance matrix – Example 2</b> .....	<b>136</b>
<b>Table E.8 — Impact assessment matrix – Example 3</b> .....	<b>137</b>
<b>Table E.9 — Likelihood assessment matrix – Example 3</b> .....	<b>138</b>
<b>Table E.10 — Likelihood conversion table – Example 3</b> .....	<b>138</b>
<b>Table E.11 — Risk acceptance matrix – Example 3</b> .....	<b>138</b>
<b>Table E.12 — Risk Severity / Mitigation matrix – Example 3</b> .....	<b>139</b>
<b>Table F.1 — Railway system glossary</b> .....	<b>140</b>
<b>Table F.2 — Example – Evaluating groups of criticalities for landside-landside communication</b> .....	<b>143</b>
<b>Table F.3 — Example – Zone criticality definition for landside-landside communication</b> .....	<b>144</b>
<b>Table F.4 — Example – Landside-landside communication matrix basic structure</b> .....	<b>145</b>
<b>Table F.5 — Example – Communication matrix - landside to landside</b> .....	<b>146</b>
<b>Table F.6 — Example – Rolling stock zone model</b> .....	<b>150</b>
<b>Table F.7 — Example – Communication matrix - rolling stock to rolling stock</b> .....	<b>151</b>
<b>Table F.8 — Example – Communication matrix - landside to rolling stock</b> .....	<b>154</b>
<b>Table F.9 — Example – Communication matrix - rolling stock to landside</b> .....	<b>155</b>

## **European foreword**

This document (CLC/TS 50701:2021) has been prepared by CLC/TC 9X “Electrical and electronic applications for railways”.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

## Introduction

The aim of this document is to introduce the requirements as well as recommendations to address cybersecurity within the railway sector.

Due to digitization and the need for more performance and better maintainability, previously isolated industrial systems are now connected to large networks and increasingly use standard protocols and commercial components. Because of this evolution, cybersecurity becomes a key topic for these industrial systems, including critical systems such as railway systems.

The purpose of this document is that, when a railway system is compliant to this document, it can be demonstrated that this system is at the state of the art in terms of cybersecurity, that it fulfils its targeted Security Level and that its security is maintained during its operation and maintenance.

This document intends to:

- provide requirements and guidance on cybersecurity activities and deliverables
- be adaptable and applicable to various system lifecycles
- be applicable for both safety and non-safety related systems
- identify interfaces between cybersecurity and other disciplines contributing to railway system lifecycles
- be compatible and consistent with EN 50126-1 when it is applied to the system under consideration
- due to lifecycle differences between safety and cybersecurity, separate safety approval and cybersecurity acceptance as much as possible
- identify the key synchronization points related to cybersecurity between system integrator and asset owner
- provide harmonized and standardized way to express technical cybersecurity requirements
- provide cybersecurity design principles promoting simple and modular systems
- allow the usage of market products such as industrial COTS compliant with the 62443 series.

## 1 Scope

This document provides the railway operators, system integrators and product suppliers, with guidance and specifications on how cybersecurity will be managed in the context of EN 50126-1 RAMS lifecycle process. This document aims at the implementation of a consistent approach to the management of the security of the railway systems. This document can also be applied to the security assurance of systems and components/equipment developed independently of EN 50126-1:2017.

This document applies to Communications, Signalling and Processing domain, to Rolling Stock and to Fixed Installations domains. It provides references to models and concepts from which requirements and recommendations can be derived and that are suitable to ensure that the residual risk from security threats is identified, supervised and managed to an acceptable level by the railway system duty holder. It presents the underlying security assumptions in a structured manner.

This document does not address functional safety requirements for railway systems but rather additional requirements arising from threats and related security vulnerabilities and for which specific measures and activities need to be taken and managed throughout the lifecycle. The aim of this document is to ensure that the RAMS characteristics of railway systems / subsystems / equipment cannot be reduced, lost or compromised in the case of intentional attacks.

The security models, the concepts and the risk assessment process described in this document are based on or derived from IEC/EN IEC 62443 series standards. This document is consistent with the application of security management requirements contained within IEC 62443-2-1 which in turn are based on EN ISO/IEC 27001 and EN ISO 27002.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50126-1:2017, *Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process*

EN IEC 62443-3-2:2020, *Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design*

EN IEC 62443-3-3:2019<sup>1</sup>, *Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels*

IEC 62443-2-1:2010, *Industrial communication networks - Network and system security - Part 2-1: Establishing an industrial automation and control system security program*

## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online Browsing Platform: available at <http://www.iso.org/obp>

NOTE The correspondence of the terms IACS, Solution and System used in EN IEC 62443 series with the terms in this document can need further clarification in future issues of the TS. Particularly, when using EN IEC 62443

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<sup>1</sup> Document impacted by EN IEC 62443-3-3:2019/AC:2019-10.