IEC/TR 62267-2

Edition 1.0 2011-03

TECHNICAL REPORT

Railway applications – Automated urban guided transport (AUGT) – Safety requirements –
Part 2: Hazard analysis at top system level

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE S

ICS 45.060

ISBN 978-2-88912-423-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RAILWAY APPLICATIONS – AUTOMATED URBAN GUIDED TRANSPORT (AUGT) – SAFETY REQUIREMENTS –

Part 2: Hazard analysis at top system level

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IEC 62267-2, which is a technical report, has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
9/1390/DTR	9/1423A/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 62267 series, under the general title *Railway applications – Automated urban guided transport (AUGT) – Safety requirements*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This Technical Report publishes the hazard analysis at top system level conducted by members of working group 45 of IEC technical committee 9 in order to allocate possible safeguards able to compensate for the absence of a driver in the front cabin of the train or attendant staff from the train as mentioned in 4.2 of IEC 62267:2009.

The hazard analysis is structured in accordance to basic functions of train operations following Table 1 of IEC 62267:2009 covering the basic hazards of train operations.

The hazard analysis tabulates the identified hazards with their associated causes and triggers as well as providing an associated list of possible safeguards able to compensate the absence of operational staff from the front cabin of a train. The results of hazard analysis do not state the choice of safeguards or the acceptable level of residual risk which may vary depending on the local safety culture. The choice of a listed safeguard or combination of safeguards, or the choice not to use any safeguard to compensate or mitigate a specific hazard in a specific application depends on the risk tolerability which is to be assessed under the responsibility of the Transport Authority and Safety Regulatory Authority by a specific risk analysis. This technical report, therefore, does not judge whether a safeguard or a combination of safeguards is necessary.

However, this technical report is intended to support Transport Authorities and Safety Regulatory Authorities in hazard identification as well as selecting and combining safeguards as a basis for a specific risk analysis required for any application with regard to their local safety culture.

IEC 62267 can be seen as a generic guideline specifying detailed safety requirements for safeguards proposed as a result of the present generic hazard analysis for the design of specific AUGT systems. The hazard analysis and the safeguards derived from it, together with their safety requirements, are based on experiences gained from design and operation of existing AUGT systems in North America, Europe and Asia.

The present generic hazard analysis and the derived safety requirements can be seen and used as part of the lifecycle of the system as defined in IEC 62278, required for any railway application including AUGT systems. The present hazard analysis covers the required hazard identification as part of risk analysis (lifecycle phase 3) and determination of safety-related system requirements (lifecycle phase 4) on a generic level, which is indispensable for design/implementation of an AUGT system. Because IEC 62267 specifies safety requirements on a generic level only, a specific risk analysis including specific hazard identification must be conducted. In order to facilitate the process of specific risk analysis and determine system requirements, the present hazard identification, the list of possible safeguards and the methodology can be used as a guide to verify the conditions of specific system environment.

The use of the present hazard analysis and derived methodology can additionally help harmonize the process of specific risk analysis in this field of application. Such a harmonized process has the intention to facilitate the necessary agreements between Transport Authorities and the resulting approval by Safety Regulatory Authorities.

RAILWAY APPLICATIONS – AUTOMATED URBAN GUIDED TRANSPORT (AUGT) – SAFETY REQUIREMENTS –

Part 2: Hazard analysis at top system level

1 Scope

This technical report provides a non normative generic hazard analysis at top system level conducted for the development of IEC 62267 for Automated Urban Guided Transport (AUGT) systems. This report is applicable to all systems covered by the scope of IEC 62267.

This generic hazard analysis cannot be used for specific applications without taking into account the specific system environment and local safety culture.

This generic hazard analysis can be used for specific AUGT systems to support the necessary activities in lifecycle process following IEC 62278 (RAMS).

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 62267:2009, *Railway applications – Automated urban guided transport (AUGT) – Safety requirements*

IEC 62278:2002, *Railway applications – Specification and demonstration of reliability, availability, maintainability and safety (RAMS)*