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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32590.1-2024

Replacing GB/T 32590.1-2016

**Railway applications - Suburban railway and urban guided
transport management and command/control systems - Part 1:
System principles and fundamental concepts
(English Translation)**

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Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms, definitions and abbreviations
3.1 Terms and Definitions
3.2 Abbreviations
4 Basic Concepts
4.1 UGT
4.2 Automation Level
4.3 Operation Management and Monitoring
4.4 Interoperability, interchangeability, compatibility and adaptability
5 System peripheral conditions and boundaries
6 General requirements and basic functions
6.1 General requirements
6.2 Basic functions
Reference

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting:

This document is part 1 of GB/T 32590 "Rail transit, urban rail and urban rail transportation management and command/control systems" GB/T 32590 has published the following parts:

- Part 1: System principles and basic concepts;
- Part 2: Functional requirements specification;
- Part 3: System requirements specification:

This document replaces GB/T 32590.1-2016 "Rail transit urban rail transit management and command/control system Part 1 Compared with GB/T 32590.1-2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) The scope of application of this document has been increased (see Chapter 1);
- b) Added additional functions, running intervals, required functions, train numbers, mobile authorization, non-UGTMS trains, optional functions, and train completeness the terms and definitions of "operating speed" and "travel speed" have been changed, and the terms "module", "manual driving" and "passenger train" have been deleted:

Terms such as application, operation control center HMI, point transmission, UGTMS vehicle-mounted equipment, and UGTMS operation control equipment are used:

Definition (see 3.1);

- c) Deleted abbreviations such as "CCTV", "DCS", "GOL", "HVAC", "UGTMSOB", and "UGTMSWS" (see:2016 edition 3:2);
 - d) "Line level" has been deleted (see 4.2:4 of the:2016 edition);
 - e) Changed the requirement of "universality under the same automation level" (see 4.4:1:1, 4:4:1:1 of the:2016 edition);
 - f) Changed the system's peripheral conditions and boundaries, and deleted the level crossing in the ground facilities: The level crossing is a specific scene and is not included in the infrastructure:
- Car wash machines have been added (see Chapter 5, Chapter 5 of the:2016 edition);
- g) The content of "Basic system performance" has been changed (see 6.1:10, 6:1:10 of the:2016 edition);
 - h) Changed the description of "Basic functions of train operation" (see 6.2:2, 6:2:1 of the:2016 edition);
 - i) The relevant description of "basic functions of operation supervision" has been changed (see 6.2:3, 6:2:2 of the:2016 edition):

This document is modified to adopt IEC 62290-1:2014 "Rail transit urban rail transit management and command/control systems Part 1 Part 1: System principles and basic concepts:

The technical differences between this document and IEC 62290-1:2014 and their reasons are as follows:

- Added the term and definition of headway (see 3.1:8), which is used in this document;
- Deleted automatic mode, component, driving onsite, emergency brake HMI, reporting train, safe places, spot transmission, parking equipment protection) and other terms and definitions (see 3.1:2, 3:1:6, 3:1:8, 3:1:9, 3:1:10, 3:1:22, 3:1:25, 3:1:27, 3:1:31, 3:1:37, 3:1:39, 3:1:40 and 3:1:42), the above terms are not used in this document;
- Deleted alternating current (AC), closed-circuit television (CCTV), direct current (DC),

data communication system (DCS), side impact protection area (PFA), ventilation and air conditioning system (HVAC), required (M), optional (O), overlap (Overlap), RAMS, route end (RD), requirement (REQ), route origin (RO), UGTMS on-board equipment (UGTMSOB), UGTMS ground equipment (UGTMSWS) and other abbreviations (see 3.2 of IEC 62290-1:2014): This document does not use the above abbreviations;

--- Changed the safety requirements of UGTMS, replaced IEC 62280 with the normative reference GB/T 24339, GB/T 28808 replaced IEC 62279 (see 6.1:2, 6:1:2 of IEC 62290-1:2014) to meet my country's national conditions;

--- Changed the electromagnetic compatibility requirements of UGTMS, replacing IEC 62236 with the normative reference GB/T 24338 (see 6.1:3, IEC 62290-1:2014, 6:1:3), to meet the national conditions of my country;

--- GB/T 32590.2 replaced IEC 62290-2 (see 6.2:1) to suit my country's national conditions:

The following editorial changes were made to this document:

--- To coordinate with the existing standards, the name of the standard is changed to "Rail Transit, Urban Rail and Urban Rail Transit Management and Command/Control Systems System Part 1: System principles and basic concepts:

Introduction

GB/T 32590 specifies the requirements for urban rail transit and train control systems based on communication for urban rail passenger transport lines and networks:

Functional requirements, system requirements and interface requirements of urban rail transportation management and command/control systems of system technology:

In this document, the abbreviation for Urban Rail Transit Management and Command/Control System is UGTMS:

There are a wide range of operational requirements from automated train operation (GOA1) to unmanned train operation (GOA4):

UGTMS is installed on some lines:

GB/T 32590 does not specifically discuss public safety issues, but the safety requirements proposed are used to ensure the safety of urban rail and urban rail transportation:

Public safety within the system:

The main purpose of GB/T 32590 is to achieve interoperability, interchangeability and compatibility:

GB/T 32590 is a recommended document for the introduction of equipment with interoperability, interchangeability and compatibility:

How to use GB/T 32590 depends on the specific needs of the specific line:

GB/T 32590 is also applicable to upgrading existing signal and command control systems: In this case, only the newly added UGT-the interchangeability and compatibility of MS equipment: The feasibility of upgrading existing equipment and the review of the interconnection level shall be the responsibility of the relevant operators:

The transport management department shall be responsible for this:

The specific application of GB/T 32590 takes into account the differences between various lines in different regions, including operational and regulatory requirements and Different safety cultures:

GB/T 32590 defines a set of UGTMS functional requirements, which are divided into mandatory functions and optional functions based on a given automation level:

Most required functions are executed unconditionally: Some specific functions are required under certain conditions (these conditions are usually related to the supplier provides one or more generic applications, including all the required functions and all or part of the available Select functions to meet the needs: General applications have interoperability under specific application conditions: Considering the different conditions in different places (such as track configuration and headway requirements), and customize common applications to form specific applications: Transportation management departments and suppliers also Additional functions may be added beyond general applications or specific applications: These additional functions are not described in GB/T 32590:

According to GB/T 21562, the transport management department is responsible for reaching an agreement with the regulatory department to conduct a comprehensive assessment of each the functional safety level of each specific application needs to be determined by a specific risk analysis:

Terms such as "safety related instructions", "safety conditions", "safe station departure" are mentioned without any hazard analysis:

GB/T 32590 is intended to consist of four parts:

---Part 1: System principles and basic concepts: The purpose is to introduce the main concepts, system definition, principles and basic concepts of UGTMS:

The other three parts correspond to the three steps required to standardize UGTMS (see Figure 1):

--- Part 2: Functional requirements specification: The purpose is to provide a functional requirement specification based on the basic functions proposed in Part 1 and the requirements specified in Figure 3 of Part 1:

System boundaries and interfaces, specifying functional requirements: FRS (Functional Requirements Specification) identifies and specifies the urban rail and urban rail transit