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**Railway applications - Energy measurement on board trains -
Part 6: Requirements for purposes other than billing
(English Translation)**

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References

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 6 of GB/T 44639 "Electric Energy Measurement System for Rail Transit Trains".

Lower part.

- Part 1: General;
- Part 2: Electrical energy measurement;
- Part 3: Data processing;
- Part 4: Communications;
- Part 5: Conformance test;
- Part 6: Requirements other than billing.

This document is modified to adopt IEC 62888-6:2019 "Rail transit train energy measurement systems Part 6: Requirements other than billing".

This document has the following structural adjustments compared to IEC 62888-6:2019.

- 6.2.1 corresponds to 6.2.2 in IEC 62888-6:2019;
- 6.2.2 corresponds to 6.2.3 in IEC 62888-6:2019;
- 6.2.3 corresponds to 6.2.1 in IEC 62888-6:2019;
- 6.4.1 corresponds to 6.4.2 in IEC 62888-6:2019;
- 6.4.2 corresponds to 6.4.1 in IEC 62888-6:2019;
- Appendix A corresponds to Appendix C of IEC 62888-6:2019;
- Appendix C corresponds to Appendix A of IEC 62888-6:2019;
- Appendix D corresponds to Appendix B of IEC 62888-6:2019.

The technical differences between this document and IEC 62888-6:2019 and their reasons are as follows.

- Replace IEC 60850 with the normative reference GB/T 1402 to adapt to my country's technical conditions and increase operability;

- Replace IEC 60044-8 with the normative reference GB/T 20840.8 to adapt to my country's technical conditions and increase operability;
- Replace IEC 62236-3-2 with the normative reference GB/T 24338.4 to adapt to my country's technical conditions and increase operability;
- Replace IEC 61287-1 with the normative reference GB/T 25122.1 to adapt to my country's technical conditions and increase operability;
- Replace IEC 62497-1 with the normative reference GB/T 32350.1 to adapt to my country's technical conditions and increase operability;
- Replace IEC 62625-1 with the normative reference GB/T 42286.1 to adapt to my country's technical conditions and increase operability;
- Added normative Appendix B "List of additional technical conditions" to adapt to my country's technical conditions and increase operability.

The following editorial changes were made to this document.

- Adjust the explanatory text in Chapter 1 "Scope" to a note;
- Deleted abbreviations such as DSI, ESI, MCF, RAMS, etc.;
- Rearrange chapter titles.

Introduction

Energy efficiency is essential to meet the challenges of supporting energy policies, protecting the environment and conserving natural resources.

Energy efficiency, especially the standardization of overall energy efficiency of rail transit vehicles, has attracted great attention from the rail transit industry, and relevant standards are being gradually formulated.

The main contents include the definition and boundary of energy efficiency, influencing factors, test methods, etc. GB/T 44639 "Railway Transit Train the Electric Energy Measurement System aims to standardize the process of acquiring train electric energy data and ensure the reliability of the data. It is planned to consist of six parts.

--- Part 1: General. The purpose is to specify the system-level requirements of the energy measurement system and to implement one or more General requirements for equipment with multiple functions.

--- Part 2: Electric energy measurement. The purpose is to specify the requirements for electric energy measurement functions for measuring the electric energy consumed and regenerated by traction units, and Requirements for the voltage measurement function, current measurement function and energy calculation function that make up the energy measurement function.

--- Part 3: Data processing. The purpose is to specify the data processing system and ground data collection service in the electric energy measurement system requirements.

--- Part 4: Communications. The purpose is to specify the requirements for on-board data communication services and vehicle-to-ground communication services of the energy measurement system.

These communication services enable data to be transferred between functions within the energy measurement system, between the energy measurement system and other on-board units, and between data Handles exchanges between the system and ground servers.

--- Part 5: Conformance test. The purpose is to specify the consistency test of new energy measurement systems installed on traction units Arrangements, and conformance testing procedures for replacement of equipment and auxiliary components.

--- Part 6: Requirements other than billing. The purpose is to clarify the requirements for energy consumption benchmark testing, daily energy consumption monitoring, and technology research and development.

Able to measure the specific requirements of the system.

The functional structure, main sub-functions and data flow of the train energy measurement system (EMS) are shown in Figure 1.

Figure 1 Schematic diagram of EMS functional structure and data flow

Rail transit train power measurement system Part 6: Requirements other than billing

1 Scope

This document specifies the specific requirements for energy measurement systems (EMS) used for energy benchmarking, routine energy consumption monitoring, and energy technology research and development.

Physical requirements.

This document provides a convenient way to monitor the on-board power consumption in daily train operation.

The data is applicable to industry sectors such as power management, energy conservation, etc. This document is not intended for billing purposes.

Note 1: EMS has practical uses in the following areas.

- a) Daily power monitoring of vehicles;
- b) Analyze the relationship between train operation and electric energy by acquiring data under influencing factors such as operating instructions and environmental conditions;