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IEEE Standard for User Interface Requirements in Communications- Based Train Control (CBTC) Systems

IEEE Vehicular Technology Society

Sponsored by the
Rail Transit Vehicle Interface Standards Committee



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Abstract: User interface requirements for communications-based train control (CBTC) subsystems are established in this standard.

Keywords: automatic train control (ATC), automatic train operation (ATO), automatic train protection (ATP), automatic train supervision (ATS), communications-based train control (CBTC), graphical user interface (GUI)

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Introduction

[This introduction is not part of IEEE Std 1474.2-2003, IEEE Standard for User Interface Requirements in Communications-Based Train Control (CBTC) Systems.]

Communications-based train control (CBTC) systems can permit more effective utilization of rail transit infrastructure by allowing trains to operate safely at closer headways than is possible with conventional track circuit-based systems, and by permitting greater flexibility and greater precision in train control. To fully exploit the capabilities and benefits of CBTC technology, however, it is important that the CBTC user interfaces be designed to take advantage of the characteristics of CBTC systems, such as:

- The ability to determine train location, to a high degree of precision, independent of track circuits.
- The availability of a geographically continuous train-to-wayside and wayside-to-train data communications network to permit the transfer of significantly more control and status information than is possible with conventional systems.
- Wayside and trainborne vital processors to process the train status and control data and provide continuous automatic train protection (ATP). Automatic train operation (ATO) and automatic train supervision (ATS) functions are optional and may also be provided, as specified by the authority having jurisdiction.

This standard has therefore been developed to establish both mandatory and optional CBTC user interface information requirements, as well as provide guidance in how this information should be presented to the user.

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IEEE Standard for User Interface Requirements in Communications-Based Train Control (CBTC) Systems

1. Overview

This standard establishes user interface requirements for communications-based train control (CBTC) subsystems. This standard is divided into 7 clauses. Clause 1 provides the scope and purpose of this standard. Clause 2 lists references to other standards that are useful in applying this standard. Clause 3 provides definitions that are either not found in other standards, or have been modified for use with this standard. Clause 4 defines general user interface requirements applicable to both CBTC trainborne and non-trainborne user interfaces, including both operational and maintenance functions. Clause 5 defines specific user interface requirements for CBTC trainborne subsystems, including what information should be displayed, and guidelines as to how this information should be displayed, with specific emphasis on operational functions. Clause 6 defines similar user interface requirements for CBTC non-trainborne subsystems. Clause 7 defines user interface requirements applicable to maintenance diagnostics for CBTC subsystems.

This standard should be read in conjunction with IEEE Std 1474.1TM-1999.¹

1.1 Scope

This standard establishes user interface requirements in CBTC systems.

1.2 Purpose

This standard will provide for consistent user interfaces that take advantage of the characteristics of CBTC systems to enhance service effectiveness of a rail transit system.

1.3 Range of applications

The CBTC user interface requirements defined in this standard are intended to be applicable to the full range of transit applications, including light rail, heavy rail, and commuter rail transit systems.

¹Information on references may be found in Clause 2.