SLOVENSKI STANDARD
oSIST prEN 50641-1:2025

01-december-2025

Fiksni postroji za železniške naprave - Stabilne naprave električne vleke - Zahteve za ocenjevanje simulacijskih orodij za snovanje elektroenergetskih napajalnih sistemov električne vleke - 1. del: Splošno

Fixed Installations for Railway Applications - Requirements for the validation of simulation tools used for the design of electric traction power supply systems - Part 1: General

Installations électriques dans les bâtiments - Exigences relatives à la mise en œuvre des systèmes électriques intelligents - Partie 1 : Exigences générales

Ta slovenski standard je istoveten z: **prEN 50641-1:2025**

ICS:

29.280	Električna vlečna oprema	Electric traction equipment

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EUROPEAN STANDARD

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Will supersede EN 50641:2020

English Version

Fixed Installations for Railway Applications - Requirements for the validation of simulation tools used for the design of electric traction power supply systems - Part 1: General

To be completed

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This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2026-01-23.

It has been drawn up by CLC/SC 9XC.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (prEN 50641-1:2025) has been prepared by CLC/SC 9XC “Electric supply and earthing systems for public transport equipment and ancillary apparatus (Fixed installations)”, of Technical Committee CLC/TC 9X “Electrical and electronic applications for railways”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dav + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dav + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dav + 36 months (to be confirmed or modified when voting)

This document will supersede EN 50641:2020 and all of its amendments and corrigenda (if any).

prEN 50641-1:2025 includes the following significant technical changes with respect to EN 50641:2020:

- Clause 1: minor changes,
- Clause 3: new definition of assessment
- Clause 5: change in Figure 1,

- Clause 6: normal and outage situation are abandoned for only one context of simulation. Clarification in the text.
- Clause 7: corrected graphs and minor improvements,
- Clause 8: minor editorial changes,
- Clause 10: minor changes,
- Annexes: graphs have been updated, mainly due to the outage situation which disappeared and corrections.

EN 50641 “Fixed installations for railway applications - Requirements for the validation of simulation tools used for the design of electric traction power supply systems” consists of the following parts:

- EN 50641-1, General
- EN 50641-2, specific DC urban case

Experts representing approximately ten member states worked to draft this new document. The results and data are taken from the most well-known representative simulation software in Europe and related experts. This document provides a means of assessing simulation tools and provides assurance to anyone who depends upon their output.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZZ, which is an integral part of this document.

1 Scope

This document specifies requirements for the acceptance of simulation tools used for the assessment of design of electric traction power supply systems with respect to EN 50388-1:2022, Clause 8.

NOTE 1 This assessment might be done with respect to TSI Energy and Directive (EU) 2016/797.

This document is applicable to the simulation of AC and DC electric traction power supply systems. The methods and parameters defined in this document are only intended for use in the validation of tools applied for the design of the electric traction power supply system, for all envisaged railway networks including those concerned by the TSI energy subsystem.

This document does not deal with validation of simulation tools by measurement.

This document focuses on the core simulation functions comprising the equations and functions which calculate the mechanical movement of trains and also which calculate the load flow of the electrical traction power supply system. In doing so this document provides all requirements necessary to demonstrate that a simulation tool may be used for the purposes of TSI approval of electric traction power supply systems. Any simulation tool which meets the acceptance requirements of the test cases in this document can be used to determine TSI compatibility for all systems of the same voltage and frequency without any requirement for further validation as part of the TSI assessment process.

This document includes controls for the modification of simulation tools, in particular the limits of applicability of validation when tools are modified. These controls focus on determining whether the core functions of the simulation model are modified.

This document provides only the requirements for demonstration of the algorithms and calculations of core functions. The use of a certified simulation tool in accordance with this document does not, in itself, demonstrate good practice in electric traction power supply system design, neither does it guarantee that the simulation models and data for infrastructure or trains used in the tool are correct for a given application. The choice and application of any models and data, of individual system components, in a design is therefore subject to additional verification processes and not in the scope of this document. Competent development of design models and full understanding of the limits of design tools remain requirements in any system design. This document does not reduce any element of the need for competent designers to lead the design process.

The test cases and data shown in Clause 6 in this document do not represent an existing network, but this data are used as theoretical/virtual network only for the purpose of verification of the core functionality.

NOTE 2 The test case considering metro, tramways and trolleybuses using DC 600 V or DC 750 V is part 2 of this document. This document can also be applied to subway, tram and trolley bus systems.

Additionally, the application of this document ensures that the output data of different simulation tools are consistent when used with the same set of input data listed in Clause 6.

This document only applies to the simulation of electric traction power supply systems characteristics at their nominal frequency for AC or DC systems. It does not consider harmonic studies, electrical safety studies (e.g. rail potential), short circuit or electromagnetic compatibility studies over a wide frequency spectrum. This document does not mandate the use of a particular simulation tool in order to validate the design of an electric traction power supply system.

This document does not consider complex models with active components such as static frequency converters.