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de l'accréditation, de la sécurité et qualité
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ILNAS-EN 50388:2005

Railway applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock to

Bahnanwendungen -
Bahnenergieversorgung und Fahrzeuge -
Technische Kriterien für die Koordination
zwischen Anlagen der

Applications ferroviaires - Alimentation
électrique et matériel roulant - Critères
techniques pour la coordination entre le
système d'alimentation (sous-station) et

08/2005



National Foreword

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**Railway applications –
Power supply and rolling stock –
Technical criteria for the coordination between power supply (substation)
and rolling stock to achieve interoperability**

Applications ferroviaires –
Alimentation électrique et matériel roulant –
Critères techniques pour la coordination
entre le système d'alimentation
(sous-station) et le matériel roulant
pour réaliser l'interopérabilité

Bahnanwendungen –
Bahnenergieversorgung und Fahrzeuge –
Technische Kriterien für die Koordination
zwischen Anlagen der Bahnenergie-
versorgung und Fahrzeugen zum
Erreichen der Interoperabilität

This European Standard was approved by CENELEC on 2005-03-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations), of the Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways. It also concerns the expertise of SC 9XB, Electromechanical material on board of rolling stock.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50388 on 2005-03-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2006-03-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2008-03-01

For TSI lines, modification and amendments shall be made within a procedure which is related to the legal status of the HS TSIs.

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 96/48/EC. See Annex ZZ.

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1 Scope

This European Standard is intended to be used to set up the requirements for the acceptance of rolling stock on infrastructure in the field of:

- co-ordination of protection principles between power supply and traction units, especially fault discrimination for short-circuits;
- co-ordination of installed power on the line and power demand of the trains;
- co-ordination of traction unit regenerative braking and power supply receptivity;
- co-ordination of harmonic behaviour.

This standard deals with the definition and quality requirements of the power supply at the interface between traction unit and fixed installations.

The standard specifies the interface between rolling stock and electrical fixed installations for traction, in the frame "supply system". The interaction between pantograph and overhead line is dealt with in EN 50367. The interaction with subsystem "control-command" (especially signalling) is not dealt with in the standard.

Requirements are given for the following categories of line:

- TSI lines (high speed and conventional),
- classical lines.

For classical lines, values, if any, are given for the existing European networks. A set of values is also specified for the future network, which is named "target" network.

The following electric traction systems are concerned:

- railways;
- guided mass transport systems that are integrated with the railways;
- material transport systems that are integrated with the railways.

This standard does not apply retrospectively to rolling stock already accepted by infrastructure managers. However, on new infrastructure, existing rolling stock may be accepted by the infrastructure manager, provided there is an agreement.

Information is given to the train operating companies on electrification parameters to enable them to confirm after consultation with the rolling stock manufacturers that there will be no consequential disturbance on the electrification system.

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.

96/48/EC, *EU council directive on the interoperability of the trans-European high speed rail system TSI sub-system Energy*, Official Journal L 235 , 17/09/1996 P. 0006 – 0024

2001/16/EC, *Directive of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system*

EN 50123-1:2003, *Railway applications – Fixed installations – D.C. switchgear, Part 1: General*

EN 50163:2004, *Railway applications – Supply voltages of traction systems*

EN 50367¹⁾, *Railway application — Current collection systems — Technical criteria for the interaction between pantograph and overhead line (to achieve free access)*

IEC 60050-811, *International Electrotechnical vocabulary (IEV) — Chapter 811: Electric traction*

EN ISO 3166-1:1997, *Codes for the representation of the names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1:1997)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

TSI line

line defined as part of the Trans European High-Speed rail network for the High Speed Technical Specification for Interoperability, TSI HS, (see 96/48/EC) or line defined as conventional as part of TEN Trans European Network in the conventional TSI (see 2001/16/EC).

It includes for the HS TSI:

- category I: specially built high-speed lines equipped for speeds generally equal to or greater than 250 km/h, named as "high speed" in this standard;
- category II: specially upgraded high-speed lines equipped for speeds of the order of 200 km/h, named as "upgraded" in this standard;
- category III: specially upgraded high-speed lines which have special features as a result of topographical, relief or town planning constraints on which the speed must be adapted to each case, named as "connecting" in this standard

3.2

classical line

line which does not belong to the TSI lines.

It includes:

- information on European networks named with their national country code (see EN ISO 3166-1);
- future target network named as "target", see 3.25

3.3

type of line

classification of lines as a function of the parameters described in 3.4 to 3.6

3.4

train power at the pantograph

active power of the train taking into account power for traction, regeneration and auxiliary

3.5

minimum possible headway

interval at which trains can run as allowed by the signalling system

3.6

maximum line speed

speed for which the line was approved for operation

¹⁾ In preparation.