SIST

SLOVENSKI STANDARD
SIST EN 16704-1:2017

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Železniške naprave - Zgornji ustroj proge - Zagotavljanje varnosti med delom na progi - 1. del: Tveganje in splošna načela za varovanje stalnih in mobilnih delovnih mest

Railway applications - Track - Safety protection on the track during work - Part 1: Railway risks and common principles for protection of fixed and mobile work sites

Bahnanwendungen - Oberbau - Sicherungsmaßnahmen bei Gleisbauarbeiten - Teil 1: Eisenbahngefährdungen und allgemeine Prinzipien zum Schutz feststehender und ortsveränderlicher Baustellen

Applications ferroviaires - Voie - Protection et sécurité durant des travaux sur la voie - Partie 1: Risques ferroviaires et principes communs de protection des chantiers fixes et mobiles

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ICS:

13.100	Varnost pri delu. Industrijska higiena	Occupational safety. Industrial hygiene
93.100	Gradnja železnic	Construction of railways

SIST EN 16704-1:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16704-1

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ICS 93.100

English Version

Railway applications - Track - Safety protection on the track during work - Part 1: Railway risks and common principles for protection of fixed and mobile work sites

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This European Standard was approved by CEN on 10 September 2016.

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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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16704-1:2016) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2017, and conflicting national standards shall be withdrawn at the latest by June 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

The purpose of this standard is to define a common approach to the safety of workers regarding the railway risks in relation to work on or in proximity of the track in the European Community.

National safety rules (for example national standards or company rules) should gradually be harmonized in line with this standard or be replaced by rules contained in this standard but according to directive 89/391/EEC it is not allowed to reduce the existing level of safety measures given by national safety rules. The current situation, in which, national safety rules continue to play a role, should be regarded as a transitional stage, leading ultimately to a situation in which, European rules described here after, will apply.

This European Standard is one of the series EN 16704 “*Railway applications – Track – Safety protection on the track during work*” as listed below:

— *Part 1: Railway risks and common principles for protection of fixed and mobile work sites*

— *Part 2-1: Common solutions and technology – Technical requirements for Track Warning Systems (TWS)*

— *Part 2-2: Common solutions and technology – Technical requirements for barriers*

— *Part 3: Competences of personnel related to work on or near the railway track*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard provides requirements and measures to deal with the significant and specific railway risks during works on or in proximity of the track and with common principles for the protection of fixed and mobile work sites with trains and/or machines circulating on the working track and trains circulating on the adjacent track(s). Railway risks and protection measures for access and egress to/from the work site are considered in the same way as railway risks and protection measures for work itself.

This European Standard is applicable to all operations related to work activities on rail guided systems. Infrastructure of metro, tram and other light rail systems is excluded from the scope[1)].

The following specific railway risks are taken into consideration:

— Risk 1: Personnel being struck by a train or injured due to wind drag from a train on open working track (safety of the worker);

NOTE 1 Risk 1 includes injuring of a worker by machines, material or equipment being struck by a train on the working track.

— Risk 2: Personnel being struck by a train or injured due to wind drag from train on adjacent track (safety of the worker);

— Risk 3: Personnel being struck by machine or train on blocked track (safety of the worker);

— Risk 4: Machines, material or equipment being struck by a train on the adjacent track (safety of the operation/safety of the worker);

— Risk 5: Personnel being electrified or electrocuted by fixed electrical equipment (safety of the worker).

NOTE 2 Risk 5 includes hazards caused by pantographs of passing trains.

This European Standard also provides requirements to the process of installing basic preventive measures when planning new infrastructure or installing corrective measures when adapting existing infrastructure.

This European Standard may be extended to third parties when it is considered appropriate and reasonable by the infrastructure manager, if one or more of the five significant risks described inside this standard, arise as a result of their activities in proximity of the track.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

FprEN 14033-2:2016, *Railway applications – Track – Railbound construction and maintenance machines – Part 2: Technical requirements for working*

FprEN 14033-3:2016, *Railway applications – Track – Railbound construction and maintenance machines – Part 3: General safety requirements*

EN 15746-2, *Railway applications – Track – Road-rail machines and associated equipment – Part 2: General safety requirements*

[1)] See Directive 2008/57/EC.

EN 15955-1, *Railway applications - Track - Demountable machines and associated equipment - Part 1: Technical requirements for running and working*

EN 15955-2, *Railway applications - Track - Demountable machines and associated equipment - Part 2: General safety requirements*

EN 16704-2-1:2016, *Railway applications – Track – Safety protection on the track during work – Part 2-1: Common solutions and technologies – Technical requirements for Track Warning Systems (TWS)*

EN 16704-2-2:2016, *Railway applications – Track – Safety protection on the track during work – Part 2-2: Common solutions and technologies – Technical requirements for barriers*

EN 16704-3:2016, *Railway applications – Track – Safety protection on the track during work – Part 3: Competences of personnel related to work on or near the railway track*

EN 50122-1:2011, *Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 1: Protective provisions against electric shock*

EN 50110-1:2013, *Operation of electrical installations - Part 1: General requirements*

EN 50126-1:1999, *Railway applications - The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Basic requirements and generic process*

EN ISO 20345, *Personal protective equipment - Safety footwear (ISO 20345)*

EN ISO 20471:2013, *High visibility clothing - Test methods and requirements (ISO 20471:2013)*

3 Terms and definitions

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

3.1
accident
unplanned, uncontrolled event giving rise to death, ill health, injury or other loss to persons or damage to material

3.2
adjacent track
track beside the working track or beside the working place where it is possible to get into the danger zone during work

Note 1 to entry: The actual work takes place on the working track/work site near an open track and is not planned to take place in the danger zone of the adjacent track, or the presence of the person in the danger zone of the adjacent track is not intended.

3.3
announcement time
period between the moment the warning starts and the moment a train passes the beginning of the work site

3.4
announcement distance
distance between the point of detection of the train and the beginning of the work site

3.5
Automatic Track Warning System
ATWS
TWS that detects approaching trains or rail vehicles by technical means (mobile technical measure)

3.6
barrier
technical solution to realize preventive separation by a set of components to separate working zone and danger zone and to prevent workers from entering the danger zone unintentionally

3.7
blocked track
track closed for normal traffic

Note 1 to entry: Engineering trains/rail bound machines are not considered as normal traffic.

3.8
clearing time
time needed to recognize the warning, to stop the work and clear the danger zone including portable equipment (in a normal manner/without hurrying) when a warning is given and reach a place of safety

3.9
danger
potential for injury or fatality

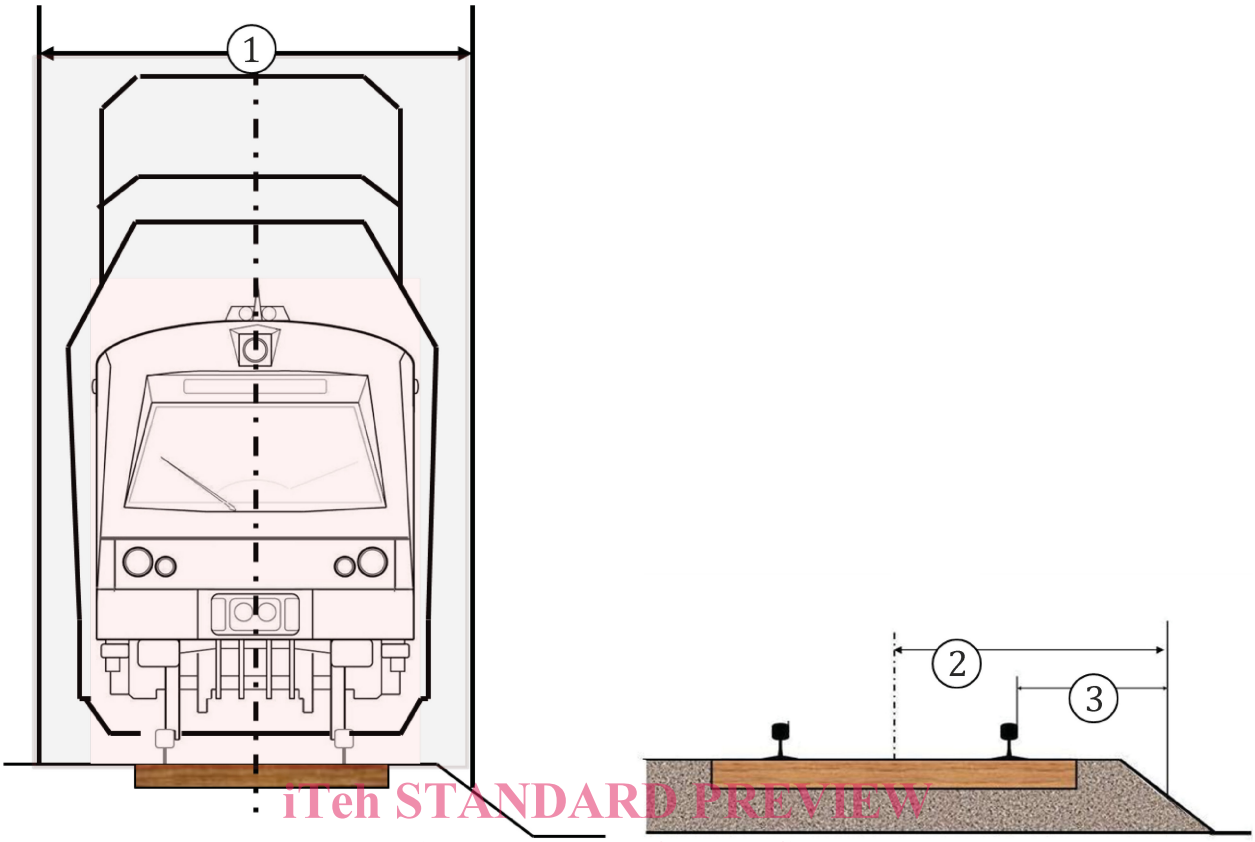
3.10
Danger Zone
area where a person, material or equipment can be struck by a railway vehicle or exposed to injury or fatality due to wind drag

Note 1 to entry: The danger zone includes the working track and extends on both sides over a distance measured from the axis of the track or the outside edges of the rail, see Figure 1. This distance is specified by national rules and is dependent on:

— the speed of the train circulation;

— the characteristics of the rolling stock (gauge and profile).

Note 2 to entry: Danger zone in tunnels is described in 7.1 and 7.2.



Key

1 danger zone

2 measurement of the danger zone of the track axis

3 measurement of the danger zone of the outside edge of the rail

Figure 1 — Definition of the danger zone

3.11
designated competent person
person being responsible for supervising e.g. of the formal inquiry, formal investigation or local investigation

3.12
emergency
unforeseen or unplanned event which has life-threatening or extreme loss implications and requires immediate attention

3.13
fixed electrical equipment
electrical equipment for traction current as far as it is under the control of the infrastructure manager

Note 1 to entry: This includes the overhead line system (see Figure 2, “safe distance”), third rail, landlines and base stations.

3.14
hazard
potential source of harm

[SOURCE: ISO/IEC Guide 51:2014, 3.2]

3.15
incident
work-related event(s) in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred, may also be referred to as a "near-miss", "near-hit", "close call" or "dangerous occurrence"

[SOURCE: OHSAS 18001:2007, 3.9]

3.16
infrastructure
all systems, equipment, materials or structures, that, combined or alone, form part of the operational railway

Note 1 to entry: Including but not limited to: the permanent way, land within the line side separation, the installations exclusively used for operational purposes, overhead electrified lines and all other systems equipment, materials or structures up to the boundaries of the railway site

Note 2 to entry: For further information see also 2598/70/EEC.

3.17
Infrastructure Manager
IM
any body or firm responsible in particular for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling; the functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or firms

[SOURCE: 2012/34/EC, definition (2)]

3.18
lookout
person who gives warning to persons working on or near the track (observing, signalling, warning)

3.19
Lookout operated warning system
LOWS
TWS with train detection provided by a suitably qualified lookout triggering the warning

Note 1 to entry: LOWS includes hand operated TWS and chain of lookouts.

Note 2 to entry: If a warning is given solely by lookouts there is no technical component.

3.20
maintenance
combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or restore it to, a state in which it can perform the required function

[SOURCE: EN 13306:2010, definition 2.1]

3.21
method statement
statement in a required format of the methods, systems, tools, plant and equipment and competence of persons to be used in performing a particular task, for the purpose of demonstrating that safety is not compromised or violated

Note 1 to entry: Developed following an assessment of the hazards/risk arising from undertaking the activity in the context of the operational railway and if appropriate the location at which the activity will be undertaken.

3.22
portable equipment
portable machines, tools, devices and material designed or adapted to be worked on the track, transportable by hand with or without trolleys or separate supports for movement on rails

3.23
processing time
time period between detection of the train (input) and giving the warning signal to the work site (output)

Note 1 to entry: The maximum processing time is a parameter of the warning process.

3.24
risk
combination of the probability of occurrence of harm and the severity of that harm

[SOURCE: ISO/IEC Guide 51:2014, definition 3.2]

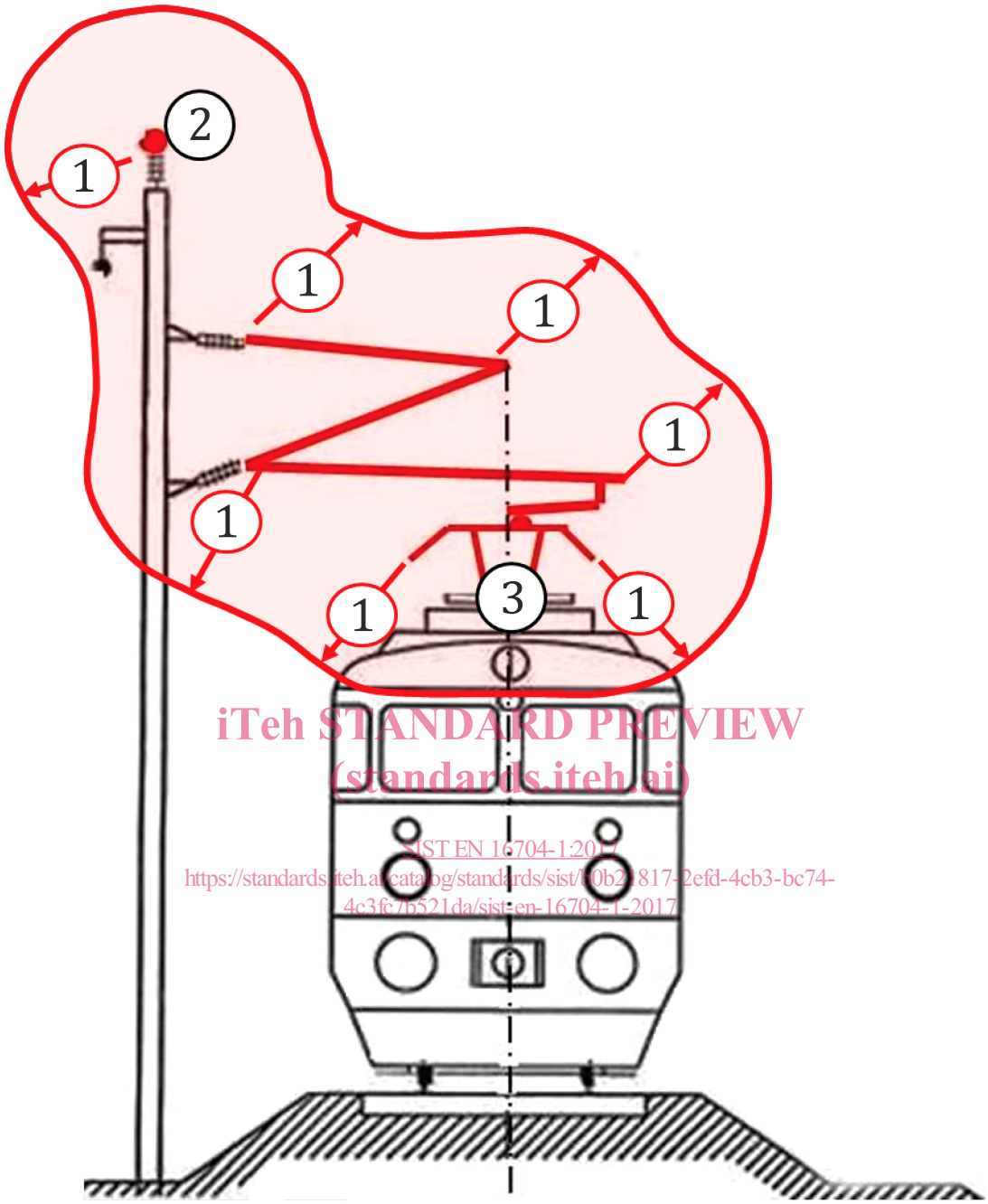
3.25
risk assessment
overall process comprising a risk analysis and a risk evaluation

[SOURCE: ISO/IEC Guide 51:2014, definition 3.12]

3.26
safe distance
closest working limit where persons, tools or equipment can come near a live part of the fixed electrical equipment without danger arising

Note 1 to entry: The safe distance is the border of the vicinity zones, see EN 50110–1. For the overhead line system, see the following figure[2)].

[2)] The outer “limit” of the vicinity zone as defined in EN 50110-1, is the demarcation line of “safe distance”.



Key

1 safe distance

2 feeder

3 pantograph

Figure 2 — Illustration of the safe distance for bare live parts of overhead line, feeder and pantograph