SLOVENSKI STANDARD
SIST-TP CLC/TR 50488:2007

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Železniške naprave - Varnostni ukrepi za osebje, ki dela na, ali v bližini nadzemnega voda.

Railway applications - Safety measures for the personnel working on or near overhead contact lines

Bahnanwendungen - Sicherheitsmaßnahmen bei Arbeiten an und in der Nähe von Oberleitungen

Applications ferroviaires - Mesures de sécurité pour le personnel travaillant sur ou a proximité des lignes aériennes de contact

Ta slovenski standard je istoveten z: **CLC/TR 50488:2006**

ICS:

13.260	Varstvo pred električnim udarom	Protection against electric shock
45.020	Železniška tehnika na splošno	Railway engineering in general

SIST-TP CLC/TR 50488:2007 **en**

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 50488

December 2006

ICS 13.260; 45.020

English version

Railway applications - Safety measures for the personnel working on or near overhead contact lines

Applications ferroviaires - Mesures de sécurité pour le personnel travaillant sur ou à proximité des lignes aériennes de contact

Bahnanwendungen - Sicherheitsmaßnahmen bei Arbeiten an und in der Nähe von Oberleitungen

This Technical Report was approved by CENELEC on 2006-11-24.

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CENELEC

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

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Foreword

This Technical Report was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations), of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the formal vote and was approved by CENELEC as CLC/TR 50488 on 2006-11-24.

Contents

Introduction

This Technical Report was prepared in order to provide a technical basis for possible further standardization activities on the subject above.

As it is known, the safety rules for the work activities on or near electrical installations are stated by EN 50110-1. This standard was conceived with particular reference to the A.C. three-phase or D.C. electric power generation, transmission and distribution systems. It states explicitly that it “has not been developed specifically to apply” to the electric traction systems, because of the particular nature of these installations.

In developing the present document, EN 50110-1 was taken as a guide, following the recommendation contained in the Scope of the abovementioned Standard.

Because of the too many differences existing and the particular scenarios, this document deals with maintenance activities in the vicinities of the overhead contact lines with nominal voltage equal or above 1,5 kV.

During the WG activity the general rules for organization of the work and personnel qualification contained in EN 50110-1 revealed to be applicable also to the electric traction lines and are reported here for the sake of completeness. According to the CEN/CENELEC Internal Regulations Part 3 – Clause 1, second paragraph, in the statements that were taken from EN 50110-1 without modification, the expressions "shall", "is to" and similar were not changed in the corresponding (should, ought to, etc.) referred to in Table G.2 of the abovementioned document.

Safety measures for live working activities are not covered in this Technical Report. In the countries where the live working on the overhead contact lines is allowed, the National Committees should state the necessary safety rules

1 Scope

This Technical Report (TR) is applicable to all work activity on or near the overhead contact line [IEC 60050-811, definition 811-33-02] of railway installations with supply voltage values as described in Table 1, derived from EN 50163.

Table 1

Electrification system	Nominal voltage V
d.c. (mean values)	1 500 3 000
a.c. (rms values)	15 000 25 000

This Technical Report applies to requirements for safe working and maintenance procedures. It applies to all electrical work activities as well as non-electrical work activities.

This Technical Report deals with the electrical hazard only. Risks coming from train traffic are not covered in this document.

This Technical Report does not apply to:

— guided mass transport systems such as tramways, elevated and underground metro railways, mountain railways, trolley bus and other conductor rail systems;

— mine or other internal industrial material transportation railways;

— railway installations with supply voltage values below 1 500 V;

— experimental electrical research work.

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.

EN 50110-1:2004, *Operation of electrical installations*

EN 50122-1:1997, *Railway applications – Fixed installations – Part 1: Protective provisions relating to electrical safety and earthing*

EN 50163:2004, *Railway applications – Supply voltages of traction systems* (IEC 60850:2000, related)

IEC 60050-811:1991, *International Electrotechnical Vocabulary (IEV) – Chapter 811: Electric traction*

IEC 60050-826:2004, *International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations*

3 Terms and definitions

For the purposes of this document the following definitions apply. Refer to the International Electrotechnical Vocabulary for other terms not defined below, like mentioned in EN 50110-1.

3.1 General

3.1.1
electric traction system
railway electrical distribution network used to provide energy for rolling stock

3.1.2
overhead contact line
contact line placed above or beside the upper limit of the vehicle gauge and supplying vehicles with electric energy through roof-mounted current collecting equipment

3.1.3
operation
all activities including work activities necessary to permit the electrical installation to function. These activities include such matters as switching, controlling, monitoring and maintenance as well as both electrical and non-electrical work

3.1.4
risk
a combination of the probability and the degree of the possible injury or damage to health of a person exposed to a hazard or to hazards

3.1.5
electrical hazard
a source of possible injury or damage to health in presence of electrical energy from an electrical installation

3.1.6
electrical danger
risk of injury from an electrical installation

3.1.7
electrical) injury
any physical damage to a person or an animal caused by electric shock, electric burn, electricarcs, or from fire or explosion initiated by electric energy

3.2 Personnel, organization and communication

3.2.1
nominated person in control of a work activity
that person who has been nominated to be the person with direct management responsibility for the work activity. Parts of this responsibility may be delegated to others as required

3.2.2
nominated person in control of an electrical installation
that person who has been nominated to be the person with direct management responsibility for the electrical installation. Parts of this responsibility may be delegated to others as required

3.2.3
skilled person
a person with relevant education and experience to enable him or her to avoid dangers which electricity may create

NOTE Adapted from IEC 60050-826-09-01.

3.2.4
(electrically) instructed person
person adequately advised or supervised by electrically skilled persons to enable him or her to perceive risks and to avoid hazards which electricity can create

NOTE Adapted from IEC 60050-826-09-02.

3.2.5
ordinary person
a person who is neither a skilled person nor an instructed person
[IEC 60050-826-09-03]

3.2.6
notification
messages or instructions which are either verbal or in writing associated with operation of any electrical installation

3.3 Working zone

3.3.1
work location
site(s), place(s) or area(s) where a work activity is to be, is being, or has been carried out

3.3.2
vicinity zone
limited space outside the live working zone where an electrical hazard can exist (see Figure 1 and Figure 2)

NOTE The outer limit of the vicinity zone is called D_V.

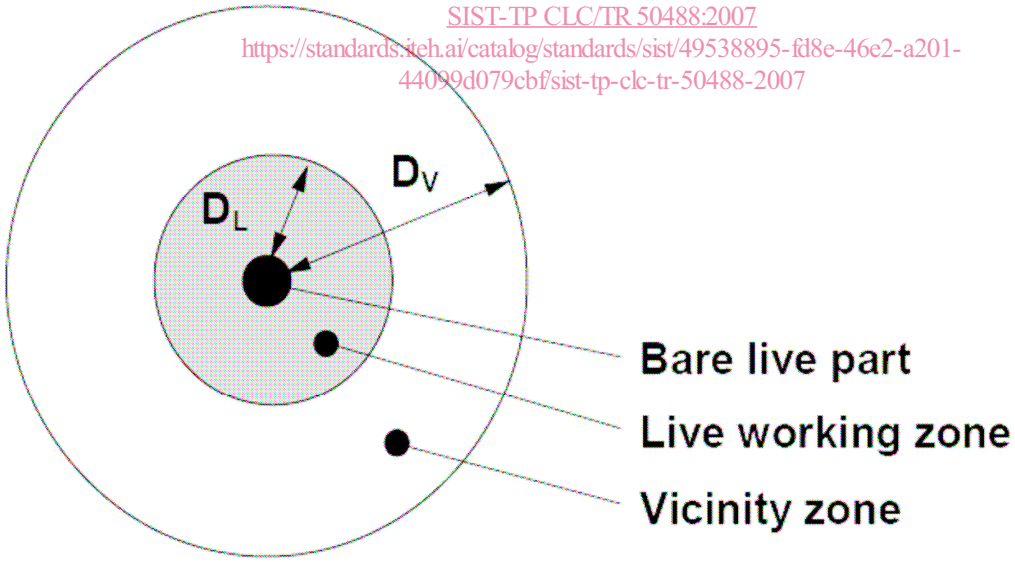

Figure 1

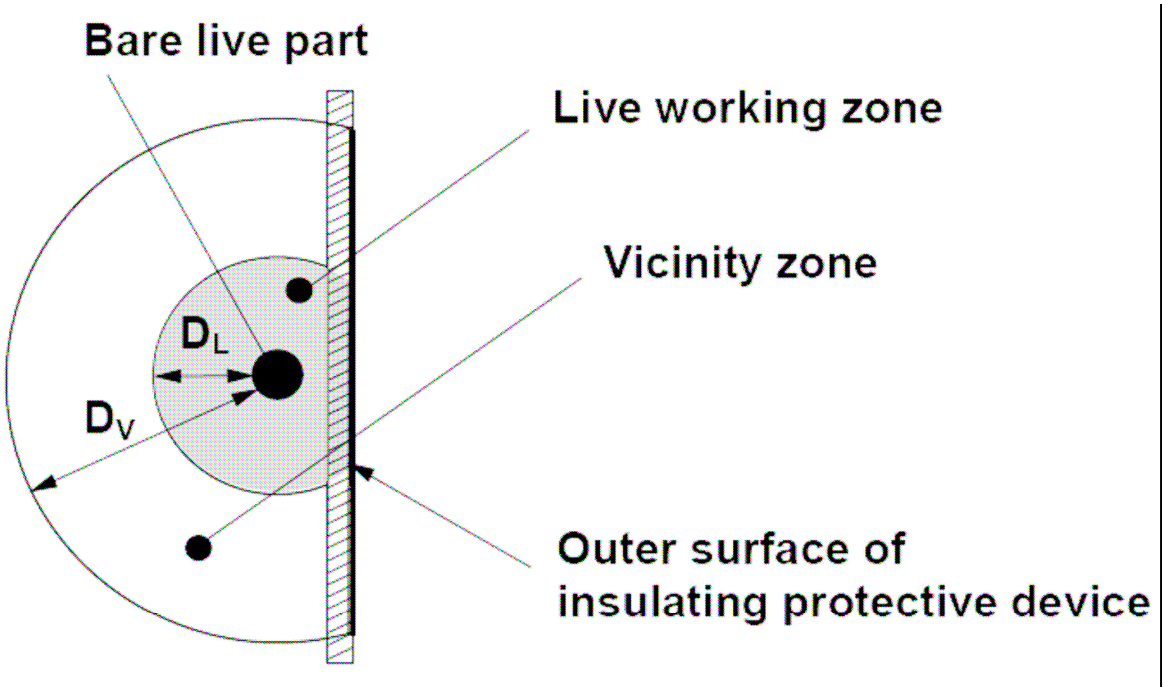

Figure 2

3.3.3
live working zone
space around live parts where prevention of electrical hazard is assured by suitable meanssuch as limiting access to skilled persons, maintaining the appropriate air distances to energized parts and using tools for live working (see Figure 1 and Figure 2)

NOTE The outer limit of the live working zone is called D_L.

3.4 Working

3.4.1
work activity
any form of electrical or non-electrical work where there is the possibility of an electrical hazard

3.4.2
electrical work
work activity on or near an electrical installation such as testing and measurement, repairing, replacing, modifying, extending, erection and inspection

3.4.3
non-electrical work
work activity near to an electrical installation such as construction, excavation, cleaning, painting, etc…

3.4.4
live working
all work activity in which a worker makes contact with live parts or reaches into the live working zone with either parts of his or her body or with tools, equipment or devices being handled

3.4.5
working in the vicinity of live parts
all work activity in which a worker with part of his or her body, with a tool or with any other object enters into the vicinity zone without encroaching into the live working zone

3.4.6
isolation
function intended to make dead for reasons of safety all or a discrete section of the electrical installation by separating the electrical installation or section from every source of electric energy

3.4.7
dead
at or about zero voltage that is without voltage and/or charge present

3.4.8
dead working
work activity on electrical installations which are neither live nor charged, carried out after having taken all measures to prevent electrical danger

3.4.9
earthing
earthing is connecting the overhead contact line to the earth

3.4.10
short circuiting
short circuiting is connecting the overhead contact line to the return circuit

NOTE Depending on the work to be performed and on the power supply system, earthing or short circuiting or both operations may be necessary taking into account that, except than in some cases, the track of the dc systems is not earthed.

3.5 Protective devices

3.5.1
screen
any device, which may be insulated or not, which is used to prevent approach to any equipment or part of electrical installation which presents electrical danger

3.5.2
barrier
a part providing protection against direct contact from any usual direction of access
[IEC 60050- 826-03-13]

3.5.3
insulating covering
a rigid or flexible cover made of insulating material used to cover live and/or unenergized parts and/or adjacent parts in order to prevent accidental contact

3.5.4
enclosure
a part providing protection of equipment against certain external influences and, in any direction, protection against direct contact
[IEC 60050-826-03-12]

3.6
nominal voltage
designated value for a system

3.7 Distances

3.7.1
minimum working distance
distance in air to be maintained between any part of the body of a worker, or any conductive tool being directly handled, and any part at different potentials, live or earthed. The minimum working distance is the sum of the electrical distance and the ergonomic component