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English version

**Safety recommendations for cableway installations designed to
carry persons - Prevention and fight against fire - Part 1:
Funicular railways in tunnels**

Recommandations de sécurité pour les installations à
câbles transportant des personnes - Prévention et lutte
contre les incendies - Partie 1 : Funiculaires en tunnel

Sicherheitsempfehlungen für Seilbahnen für den
Personenverkehr - Brandverhütung und -bekämpfung - Teil
1: Tunnelstandseilbahnen

This Technical Report was approved by CEN on 24 February 2004. It has been drawn up by the Technical Committee CEN/TC 242.

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Contents

Page

Foreword	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 General recommendations	8
4.1 Application of the technical report	8
4.2 Safety principles	8
4.2.1 Hazard scenarios	8
4.2.2 Safety measures	8
5 Basic recommendations	9
6 Recommendations concerning fire prevention and firefighting in the carriers	10
6.1 Materials	10
6.2 Electrical cabinets	10
6.3 Cabling outside the electrical cabinets and lighting	10
6.4 Batteries	10
6.5 Battery chargers	11
6.6 Video equipment (camera, monitor)	11
6.7 Heating, air conditioning	11
6.8 Electrical components outside cabinets which are energized during travel (dynamos, alternators, motors)	11
6.9 Pantographs	11
6.10 Rail brake – Retarder	11
6.11 Hydraulic power plants and circuits – Pressure vessels – Refrigerants	11
6.12 Rotating parts (wheels, axles, bearings)	12
6.13 Prohibition of smoking, open fires and the transportation of flammable materials	12
6.14 Extinguishers and other means of firefighting	12
6.15 Dimensioning of the carriers	12
6.16 Recovery measures in the event of a fire on board the carrier	12
6.17 Emergency exits from the carriers	13
7 Recommendations concerning fire prevention and firefighting in the tunnel	13
7.1 Tunnel materials	13
7.2 Fire – Smoke from a station	13
7.3 Rails and overhead catenaries supplying auxiliary electrical energy to the carriers	13
7.4 Lighting equipment	13
7.5 Transmission of electrical energy in the tunnel	13
7.6 Remote communication cable between carrier and control point	14
7.7 Transportation of flammable liquid inside the tunnel	14
7.8 Spaces adjacent to the tunnel (outside stations)	14
7.9 Communication device	14
8 Recommendations concerning fire prevention and firefighting in stations	14
8.1 General	14
8.2 Platform materials	15
8.3 Maintenance pit beneath carriers at the platform	15
8.4 Spaces adjacent to the platforms	15
8.5 Transmission of electrical energy	15
8.6 Contacts for recharging of the carrier batteries	16

8.7	Video equipment (camera, monitor)	16
8.8	Dispensing machines for users and other platform furniture	16
8.9	Prohibition of smoking, open fires and the transportation of flammable materials	16
8.10	Extinguishers.....	16
8.11	Smoke detection and clearing.....	16
9	Recommendations concerning fire prevention and firefighting in the machine room and the space for the electrical power system.....	16
9.1	Prevention.....	16
9.2	Limitation of spread of fire.....	17
10	Recommendations concerning fire prevention and firefighting in the electrical supply spaces.....	17
11	Recommendations concerning fire prevention and firefighting in the control room	17
11.1	Civil engineering.....	17
11.2	Spaces adjacent to the control point.....	17
11.3	Electrical equipment.....	17
11.4	Video monitors	18
11.5	Space heating	18
11.6	Domestic utensils.....	18
11.7	Furniture	18
11.8	Putting safety devices out of service.....	18
11.9	Personnel.....	18
12	Lightning.....	18
13	Training of personnel	19
14	Maintenance.....	19
	Bibliography	20

Foreword

This document (CEN/TR 14819-1:2004) has been prepared by Technical Committee CEN/TC 242 "Safety requirements for passenger transportation by rope", the secretariat of which is held by AFNOR.

CEN/TR 14819 comprises the following parts presented under the general title of *Prevention and fight against fire*:

Part 1: Funicular railways in tunnels

Part 2: Other funicular railways and other installations

This document forms part of the standards programme approved by the CEN Technical Board (CEN/BT) on safety requirements for cableway installations designed to carry persons:

- 1 Safety requirements for cableway installations designed to carry persons - Terminology
- 2 Safety requirements for cableway installations designed to carry persons - General requirements
- 3 Safety requirements for cableway installations designed to carry persons - Calculations
- 4 Safety requirements for cableway installations designed to carry persons - Ropes
- 5 Safety requirements for cableway installations designed to carry persons - Tensioning devices
- 6 Safety requirements for cableway installations designed to carry persons - Drive systems and other mechanical equipment
- 7 Safety requirements for cableway installations designed to carry persons - Carriers
- 8 Safety requirements for cableway installations designed to carry persons - Electrical equipment other than for drive systems
- 9 Safety requirements for cableway installations designed to carry persons - Civil engineering works
- 10 Safety requirements for cableway installations designed to carry persons – Pre-commissioning inspection, maintenance and operational inspection and checks
- 11 Safety requirements for cableway installations designed to carry persons – Recovery and evacuation
- 12 Safety requirements for cableway installations designed to carry persons - Operation
- 13 Safety requirements for cableway installations designed to carry persons - Quality assurance

Together these form a series of standards regarding design, manufacture, construction, maintenance and operation of all cableway installations designed to carry persons.

Introduction

This report has been prepared by a working group set up by TC 242 "Safety requirements for passenger transportation by rope". It responds to a request by the European Commission and CEN and will be of use to operators and designers of funicular railways in tunnels.

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1 Scope

This part of CEN/TR 14819 specifies safety recommendations applicable to the prevention and fighting of fires in funicular railways in tunnels that may endanger the health and safety of persons.

This part of CEN/TR 14819 covers the design, manufacture, construction, maintenance and operation of all funicular railways running in tunnels of length greater than 300 m or where the evacuation zones are more than 300 m apart, an evacuation zone being comparable to a station from the point of view of protecting passengers against fire risks. Tunnels with these characteristics are called "long tunnels" in the following.

For shorter tunnels, some of the same measures could be applied depending on the results of the installation safety study and taking account particularly of the number of passengers and the width of the evacuation passage.

With regard to these fire problems, it is essential to take organizational measures relating to operation, but these are not covered in this document

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

.ENV 1907:1999, *Safety requirements for cableway installations designed to carry persons – Terminology*.

EN 50119, *Railway applications – Fixed installations – Electric traction overhead contact lines*.

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

EN 50122-1, *Railway applications – Fixed installations – Part 2: Protective provisions against the effects of stray currents caused by d.c. traction systems*.

EN 50206-2, *Railway applications – Rolling stock – Pantographs: Characteristics and tests – Part 2: Pantographs for metros and light rail carriers*.

EN 50264-1, *Railway applications – Railway rolling stock cables having special fire performance – Standard wall - Part 1: General requirements*.

EN 50290-2-27, *Communication cables – Part 2-27: Common design rules and construction – Halogen free flame retardant thermoplastic sheathing compound*

prEN 13796-1, *Safety requirements for cableway installations designed to carry persons – Carriers – Part 1: Grips, carrier trucks, on-board brakes, cabins, chairs, carriages, maintenance carriers, tow-hangers*.

prEN 45545-1, *Railway applications – Fire protection of railway vehicles – Part 1: General*.

prEN 45545-2, *Railway applications – Fire protection of railway vehicles – Part 2: Fire resistance requirements for materials and components*.

prEN 45545-3, *Railway applications – Fire protection of railway vehicles – Part 3: Fire resistance requirements for fire barriers and partitions*.

prEN 45545-4, *Railway applications – Fire protection of railway vehicles – Part 4: Fire safety requirements for railway rolling stock design*.

prEN 45545-5, *Railway applications – Fire protection of railway vehicles – Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation carriers.*

prEN 45545-6, *Railway applications – Fire protection of railway vehicles – Part 6: Fire control and management systems.*

prEN 45545-7, *Railway applications – Fire protection of railway vehicles – Part 7: Fire safety requirements for flammable liquid and flammable gas installations.*

prEN 50163, *Railway applications – Supply voltages of traction systems.*

EN ISO 13943:2000, *Fire safety – Vocabulary (ISO 13943:2000).*

IEC 60331-11, *Tests for electric cables under fire conditions – Circuit integrity – Part 11: Apparatus – Fire alone at a flame temperature of at least 750 °C.*

IEC 60331-21, *Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0, 6/1, 0 kV.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ENV 1907:1999, EN ISO 13943:2000 and the following apply:

3.1

control point

operator's position in the control room of the drive station where all the types of travel may be monitored

3.2

fire resistance

ability of an object to maintain for a specified period the required fire stability, fire integrity, thermal insulation and/or any other required function specified in a standardized fire resistance test

NOTE The qualifier "fire resistant" only applies to this ability.

3.3

reaction to fire

behaviour of a material that, as a result of its own decomposition, feeds a fire to which it is exposed under specified conditions

3.4

fire stability criterion "R"

criterion determining the ability of an element or a structure to withstand specified loads and/or actions during the appropriate fire resistance test

3.5

fire barrier, fire integrity criterion "E"

criterion determining the ability of a separating element to prevent the passage of flames and hot gases

3.6

thermal insulation, fire break criterion "I"

criterion determining the ability of a separating element to prevent the passage of heat during a fire resistance test

3.7

REI time, EI time

minimum time for which the criteria are met (examples REI 60, EI 30)