



Instituto da Mobilidade
e dos Transportes Terrestres, I.P.



RAIL TRANSPORT
ANNUAL SAFETY REPORT 2009





Instituto da Mobilidade
e dos Transportes Terrestres, I.P.

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A.1 – Scope

The main aim of this report is to detail IMTT [Institute for Mobility and Land Transport] activities in its role as the National Railway Safety Authority during 2009 and highlight developments in the safety of passenger and goods transport on the National Railway Network.

It does not cover the activities of other guided transport systems, such as metros, light railways, trams, electric trains and cable cars.

A.2 – Summary

The IMTT Annual Safety Report 2009 sets out the activities of the Portuguese National Railway Safety Authority, the Common Safety Indicators and the year's most significant safety-related events.

The report gives a detailed description and analysis of railway safety performance over the last five years in order to identify trends

that may inform decision-making on future measures to improve railway safety.

The report does not cover the activities of other guided transport systems such as metros, light railways, trams, electric trains and cable cars.

B – Introduction

B.1 – Introduction to the report

The drafting and publication of this report for 2009 discharges the legal requirement to publish an annual report on rail transport safety, as set out in Article 66-O of Decree Law No 270/2003, as amended by Decree Law No 231/2007 of 14 June.

The IMTT produced this report in accordance with European Railway Authority (ERA) guidelines and recommendations on the content and structure of National Safety Authority annual safety reports.

This report sets out the IMTT's safety-related activities, highlighting its initiatives for improving railway safety, and covers the publication of relevant safety rules, the development of the safety certification and authorisation for undertakings and the supervision of their activities.

In addition to details of these activities, Annex C of the report also contains the Common Safety Indicators (CSIs) listed in Annex V of the above-mentioned Decree Law and used to measure and assess safety performance.

The data published in this report were taken from the annual safety reports of rail transport and infrastructure management undertakings, submitted to the IMTT in accordance with the provisions of Article 66-C of the above-mentioned Decree Law.

Accident data consistency checking and final confirmation were carried out using a participatory, transparent process involving transport and infrastructure management undertakings, and they were given the opportunity to correct the data, guaranteeing their reliability.

This report will be circulated directly to the following:

- Ministry of Public Works, Transport and Communications
- European Railway Authority
- *Gabinete de Investigação de Segurança e Acidentes Ferroviários (G/SAF)* [Safety and Rail Accident Investigation Bureau]
- Infrastructure management and rail transport undertakings.

It will also be made available to the public through the IMTT website.

B.2 – Information on the structure of the railway system

A generic description of the national railway network and details of railway network and infrastructure management undertakings are provided in Annex A.

B.3 – Trends

B.3.1 – Accidents

The results for 2009 were fairly positive, with an improvement compared to 2008 and compared to the average over the last six years, represented by a significant reduction in the number of accidents and their undesirable consequences.

This drop in accidents has sharpened the downward trend for various aspects: drop in accident frequency, in the number of accident victims, and a general drop in the risks to which the public are exposed when using public rail transport.

However, in contrast to this trend of a reduction in accidents, over the past few years there has been a consistent increase in the number of suicides, a situation that worsened in 2009.

Despite the continuing drop in the number of level crossings and improved safety on those that remain, there has been no substantial improvement in the number of accidents at these crossings.

Another private goods transport undertaking, TAKARGO, which started up operations and received certification in 2008, expanded its operations on Portuguese territory. As a result, in 2009 the IMTT awarded TAKARGO eight new Part B Safety Certificates to provide transport services on new routes.

As in 2008, the remaining uncertified undertakings that provide railway services (CP and REFER) did not ask for their safety management systems to be approved during 2009 and for a Safety Certificate or Authorisation to be awarded.

B.3.2 – Developments in Safety Management

The most significant event of 2009 in terms of safety management was the awarding of safety certificates to two new undertakings that began operations on the Portuguese market, within the railway goods transport deregulation framework: as a result of hiving off the goods unit of the parent company, a new Portuguese undertaking was launched (CP Carga) and a private Spanish undertaking also commenced operations (COMSA RAIL).

C – Organisation of the IMTT

The IMTT was created by Decree Law No 147/2007 of 27 April and took on the land passenger, goods and other transport responsibilities of various defunct industry bodies (in the case of the railways, from the INTF). It also took responsibility for matters related to drivers, transport professionals, vehicles and infrastructure.

The IMTT has a functionally autonomous Railway Regulatory Unit with responsibilities for the economic and technical regulation of this subsector.

C.1 – Mission

The IMTT's mission is to regulate, monitor and take responsibility for coordinating and planning the land transport sector in order to meet the mobility needs of people and goods.

It is also responsible for supervising and regulating the sector's activities and promoting the safety and quality of the service and the rights of land transport service users.

C.2 – Safety

The IMTT is the designated National Safety Authority, as provided for in European Parliament and Council Directive 2004/49/EC of 29 April 2004 on safety on the Community's railways, and has the power to:

- approve, authorise and certify vehicles and equipment used by land transport systems, including railway infrastructure, guarantee the required technical and safety standards and authorise and supervise the agencies

responsible for certification and inspection;

- approve and reject safety management systems and impose penalties for inadequate performance;
- monitor land transport sector activities and ensure that the system for dealing with administrative offences is applied;
- decide on the introduction of technical improvements in the railway and road subsectors in the light of technological changes with a view to improving safety, making services more efficient and reducing negative environmental impacts.

C.3 – Organisation chart

See Annex B1 for the IMTT organisation chart.

C.4 – Workforce

To discharge its responsibilities in the road and rail transport sectors throughout national territory, the IMTT had a labour force of 886 on 31 December 2009.



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For the purposes of regulating safety on guided transport systems such as metros, light railways, trams and cable cars in 2009, the IMTT's Railway Infrastructure and Equipment Department, part of the Directorate for Technical Regulation and Safety Services, employed:

- 1 Departmental Head
- 5 Senior Technical Officers
- 1 Administrative Technical Officer

C.4 – Relations with other agencies

In discharging its responsibilities as the National Railway Safety Authority, the IMTT has institutional relations with various agencies, as shown in Annex B.2.

D – Development of railway safety

D.1 – Implementation of Directive 2004/49/CE (Railway Safety Directive)

Directive 2004/49/EC was transposed into Portuguese legislation (only in part in the case of safety aspects) by Decree Law No 231/2007 of 14 June, which amended Decree Law No 270/2003 of 28 October. This Decree Law made safety certification and authorisation obligatory, established common safety indicators, objectives and methods and set out the safety responsibilities of the railway regulator – the IMTT.

Transposition of the Directive into national legislation was completed with the publication of Decree Law No 394/2007 of 31 December, which set out the responsibilities, jurisdiction and procedures of the Gabinete de Investigação de Segurança e Acidentes Ferroviários (GISAF) [Safety and Rail Accident Investigation Bureau] for the technical investigation of accidents and incidents. GISAF's nature, mission and organisation were set out in Decree Law No 395/2007 of 31 December.

In order to make Decree Law No 270/2003, as amended by Decree Law No 231/2007, operational, the IMTT immediately made arrangements for drafting the following regulations:

- Regulation on common emergency procedures (Article 66);
- Regulation on the procedure for approving safety management systems (Article 66-B);
- Regulation on safety certification and authorisation (Article 66-I);

- Regulation on training, inspections and the issue of certificates, personnel with safety-related functions (Article 66-L).

At the beginning of 2009, the documents were made available for public scrutiny, although none were published until the end of the year. In 2010, the regulations for issuing safety certificates and authorisations were published (Article 66-I).

Even though the regulatory framework was not completed in 2009, it was possible, based on the criteria and methods produced by ERA working groups, to develop safety certification processes allowing two new rail goods transport undertakings to start up, and the further development of activities of the undertaking certified in 2008.

Therefore, 2009 can be thought of as the year in which implementation of the Railway Safety Directive was developed and consolidated.

D.2 – Initiatives for maintaining or improving safety

The most significant initiatives for maintaining and improving rail transport safety are presented in Tables D.2.1 and D.2.2 respectively. Some initiatives were

taken in response to accidents while others continued previous initiatives and were implemented by the IMTT and railway undertakings.

Safety initiatives	Accidents giving rise to the measure		
	Date	Place	Description
Maintaining suspension of traffic on the Tua line between the stations at Tua and Cachão	22.08.2008	Tua line	Derailment of railcar LRV 9503

Table D.2.1 – Most significant safety initiatives taken in response to accidents

Safety initiatives	Reason
Maintaining suspension of traffic on the Corgo and Tâmega lines and on the Figueira da Foz branch line	Improvement of operating conditions and increasing traffic safety
Continuing the safety improvement programme for level crossings, eliminating 41 crossings and reclassifying a further 7.	Eliminating/reducing accidents associated with level crossings.

Table D.2.2 – Most significant safety initiatives taken for other reasons

D.3 – Analysis of trends

The data presented in this report was analysed and processed based on the harmonised definitions and methods of the European Community, developed by the European Railway Agency, and laid down in Directive 2009/149/EC of 27.11.2009, amending Annex 1 of Directive 2004/49/EC (Safety Directive).

This section of the report provides an analysis of some trends revealed by the Common Safety Indicators over the six-year period from 2004 to 2009.

It also provides an analysis of the safety performance of the railway network in 2009 by comparing the six-year averages with the previous year's figures.

Annex C contains tables of numeric data, ratios and definitions used in analysing common safety indicators for 2009.

D.3.1 – Number of accidents

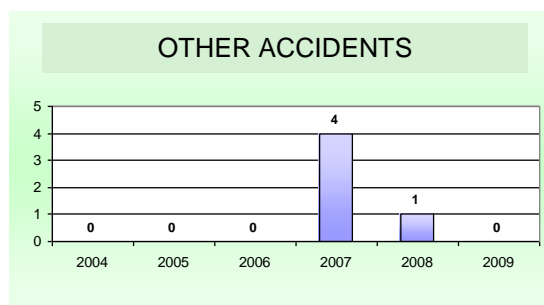
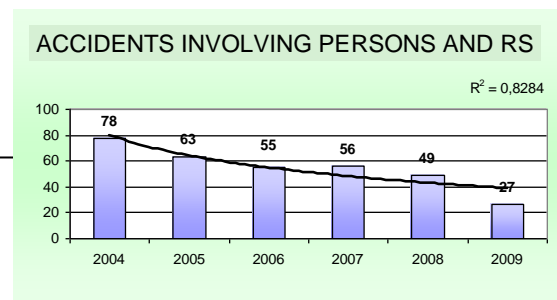
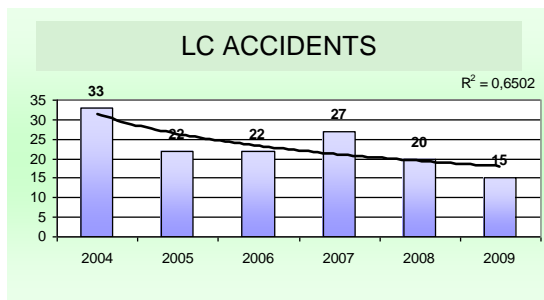
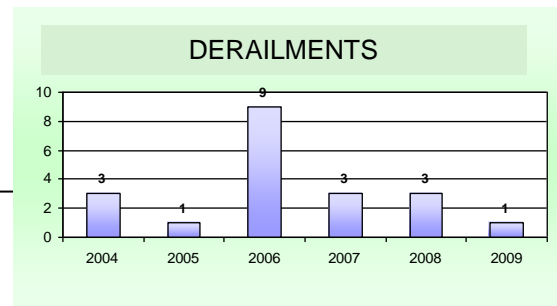
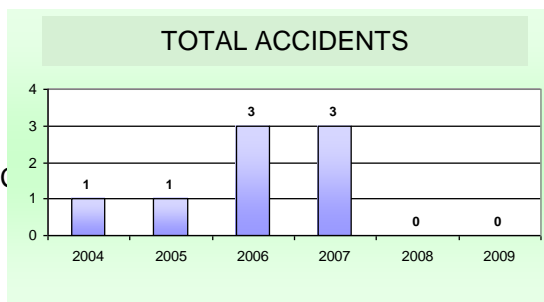
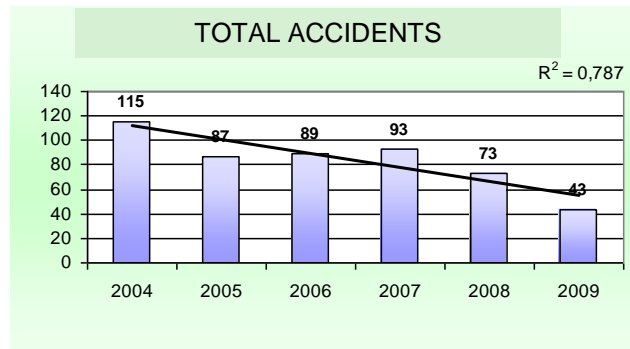
There was a significant drop in the number of accidents in 2009, both in comparison to 2008 (- 41%) and relative to the average for the last six years (- 48 %). This was mainly due to a drop in accidents at level crossings (- 35 % against the average) and in accidents involving persons caused by rolling stock in motion (-51% against the average).

Over the past six years, it has become the norm with our railway system and in the rest of Europe for the categories in which most accidents occur to be (a) accidents to persons caused by rolling stock in motion, and (b) accidents at level crossings.

For the sixth consecutive year there were no collisions between trains and over the last two years no trains have collided with obstacles on the track. Also for the sixth consecutive year, there were no accidents due to fires on rolling stock.

The charts on the next page indicate the number of accidents during the period from 2004 to 2009 and show the respective trends.

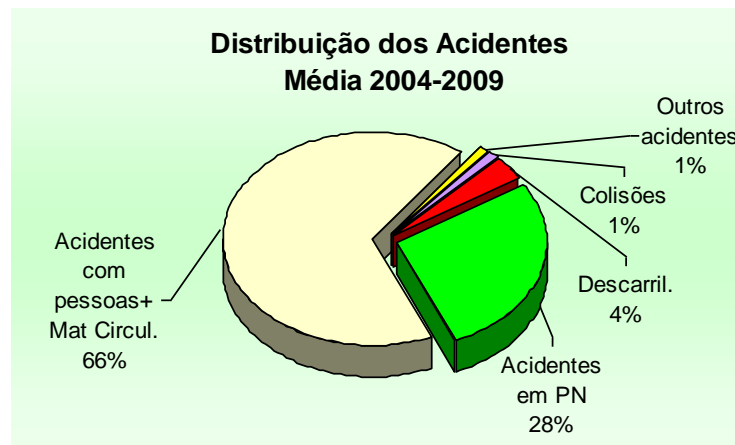
Number of Accidents	2004	2005	2006	2007	2008	2009	Average
Total number of accidents	115	87	89	93	73	43	83
Train collisions, including collisions with obstacles within the clearance gauge	1	1	3	3	0	0	1
Train derailments	3	1	9	3	3	1	3
Accidents at level crossings, including accidents involving pedestrians	33	22	22	27	20	15	23
Accidents to persons caused by rolling stock in motion, except for suicides	78	63	55	56	49	27	55
Fires in rolling stock	0	0	0	0	0	0	0
Other accidents	0	0	0	4	1	0	1
Suicides	25	39	40	52	50	69	46



The charts show a clear downward trend in the total number of accidents. This correlates closely with the downward trend in the categories in which accidents are more frequent: accidents to persons caused by rolling stock in motion and accidents at level crossings.

The distribution of accidents and their relative importance remains virtually unchanged compared to the previous year, with two-thirds occurring in the category of accidents to persons caused by rolling stock in motion and just over a quarter in accidents at level crossings.

Derailments and collisions represent a small minority of the total number of accidents: 5%.



Average Distribution of Accidents
2004-2009
Accidents involving persons + RS in motion
66%
Other accidents 1%
Collisions 1%
Derailments 4%
Accidents at LCs 28%

D.3.2 – Fatalities

D.3.2.1 – Fatalities by accident type

Total fatalities by accident type	2004	2005	2006	2007	2008	2009	Average
Total for all accidents	72	47	53	58	42	32	51
Train collisions, including collisions with obstacles within the clearance gauge	0	0	0	0	0	0	0
Train derailments	3	0	0	3	1	0	1
Accidents at level crossings, including accidents involving pedestrians	26	11	18	20	15	17	18
Accidents to persons caused by rolling stock in motion, except for suicides	43	36	35	35	26	15	32
Fires in rolling stock	0	0	0	0	0	0	0
Other accidents	0	0	0	0	0	0	0

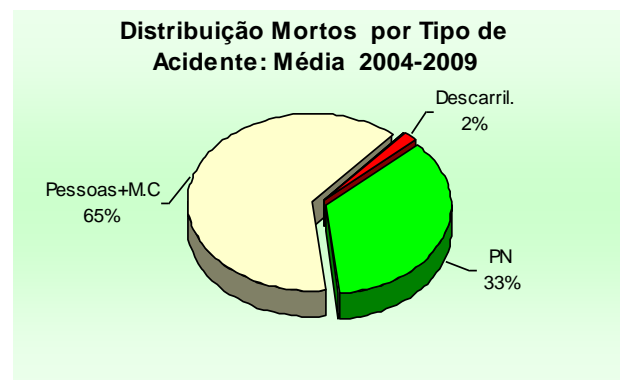
In 2009, the number of fatalities resulting from railway accidents was the lowest since statistics were first recorded in 2004. There was a significant drop in comparison to 2008 (10 fewer fatalities), due mainly to a drop in the number of victims of accidents caused by rolling stock in motion.

In Portugal, as in other European countries, the overwhelming majority of fatalities (98%) involve people using railway property inappropriately, either by trespassing or by failing to observe the rules at level crossings, as shown in the accompanying charts.

The accidents involving the most fatalities are, on average, those caused by rolling stock in motion (almost two-thirds) and those occurring at level crossings (one third).

Although subject to more intense media attention and causing greater social impact, derailments account for only 2% of fatalities.

The positive effect of increased safety on the railway system is reflected by the fact that, over the last six years, there have been no fatalities caused by train collisions.



Distribution of Fatalities per Accident Type: Average 2004-2009
Persons+RS 65%
Derail. 2%
LC 33%

D.3.2.1 – Fatalities per category of person

Fatalities per category	2004	2005	2006	2007	2008	2009	Average
Total	72	47	53	58	42	32	54
Passengers	0	0	0	1	3	0	1
Employees	3	2	1	5	1	1	2
LC users	26	11	18	20	15	17	18
Unauthorised persons	43	33	34	32	23	14	33
Others	0	1	0	0	0	0	0

In 2009, there was a reversal in the trend (see the table and chart), and for the first time ever the number of fatal accidents at level crossings was higher than the number of persons killed as a result of trespassing in railway property (unauthorised persons), in stark contrast to the figures for the previous five years.

Changes in the figures in comparison to 2008 are indicated below:

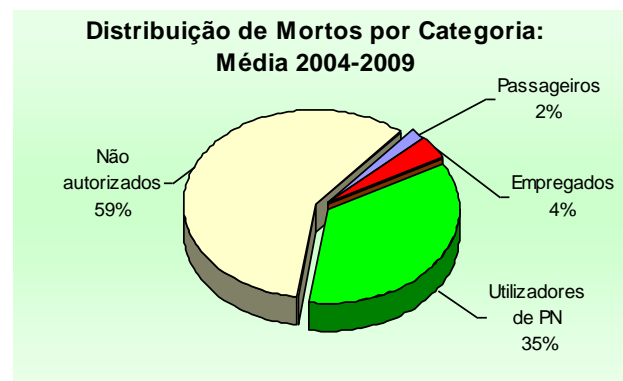
Passengers: - 3
Employees: no change
LC users: + 2
Unauthorised persons: - 9
Others: 0
Total: - 10

Average distribution over the last six years shows that the overwhelming majority of fatal accidents involve trespassers on railway property (Unauthorised Persons) and Level Crossing Users (94%).

The records show that railway transport is a particularly safe means of passenger transport, with passengers accounting for only 2% of fatalities.

The trend shows a clear and consistent drop in the number of fatalities due to railway accidents (see charts on next page).

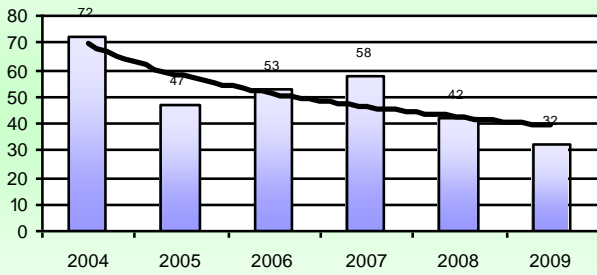
In addition, despite the reduction in the number of level crossings that has been achieved over the past few years, fatalities on level crossings have not shown the significant reduction that could be expected.



Distribution of Fatalities by Category:
Average 2004-2009
Unauthorised 59% Passengers 2%
Employees 4% LC Users 35%

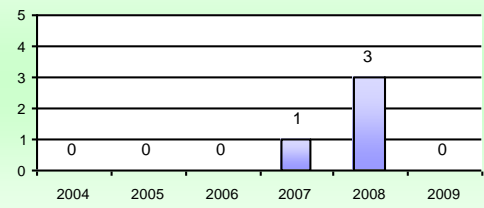
Nº MORTOS

$R^2=0,6628$



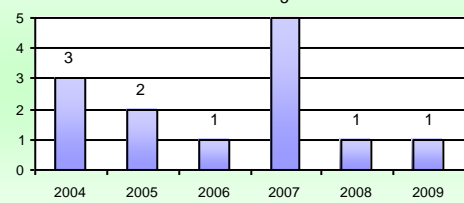
TOTAL FATALITIES

Nº PASSAGEIROS MORTOS



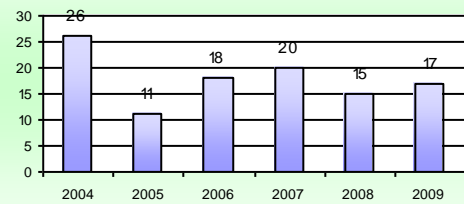
PASSENGERS KILLED

Nº TRABALHADORES MORTOS



EMPLOYEES KILLED

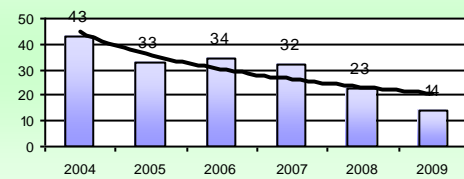
Nº UTILIZADORES DE PN MORTOS



LC USERS KILLED

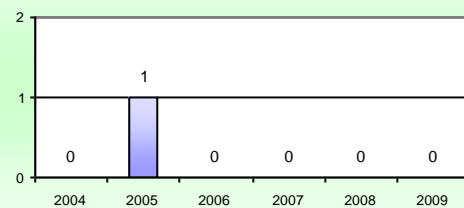
Nº PESSOAS NÃO AUTORIZADAS MORTAS

$R^2=0,7932$



UNAUTHORISED PERSONS KILLED

Nº OUTRAS PESSOAS MORTAS



OTHER PERSONS KILLED

D.3.3 – Suicides

It must be borne in mind that suicides are not deemed to be accidents since they constitute voluntary acts intended to harm those who commit them. In addition to being personal and social tragedies, suicides cause enormous disruption to the railways.

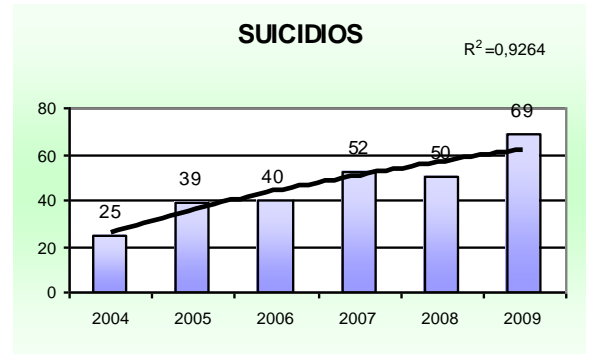
In 2009, based on documentary evidence and witness statements, 69 fatalities were classified as suicides. This is a significant increase on the figure for 2008 (+38%), confirming the upward trend for this type of occurrence.

In the period from 2004 to 2009, there is a striking contrast between the figures for accident fatalities, which show a clear downward trend, and the number of suicides which is on the increase.

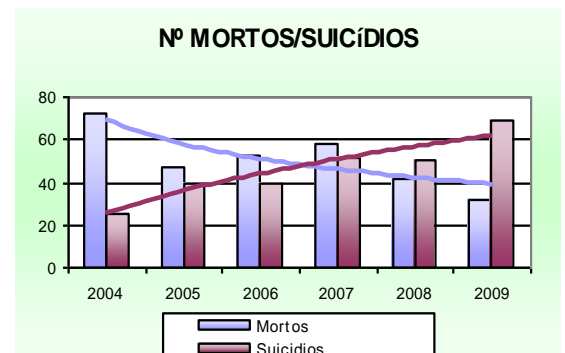
An interesting statistic for assessing the impact of suicides on the railway system is the contribution they make to the total fatalities recorded on railway property. The chart shows that, on average, suicides account for almost half of the total fatalities that have occurred over the last six years.

Another interesting observation is the fact that the total number of fatalities on railway property (accidental deaths and suicides) has remained fairly stable around an average figure of 97.

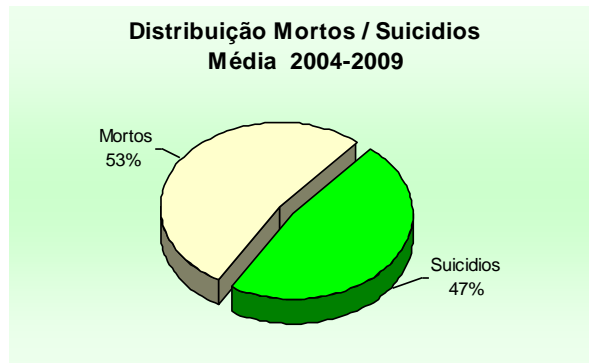
[Fatalities + Suicides]



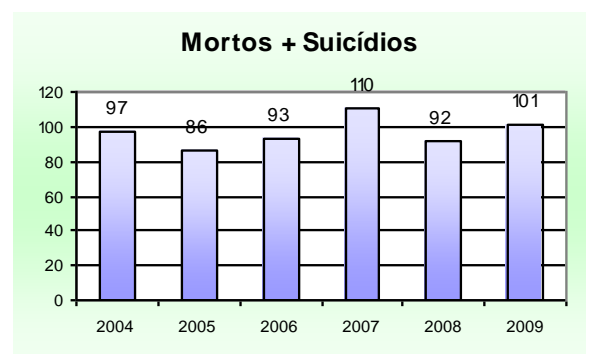
SUICIDES



FATALITIES vs SUICIDES
Fatalities Suicides



Average Distribution Fatalities vs Suicides
2004-2009 Fatalities 53% Suicides 47%



D.3.4 – Serious Injuries

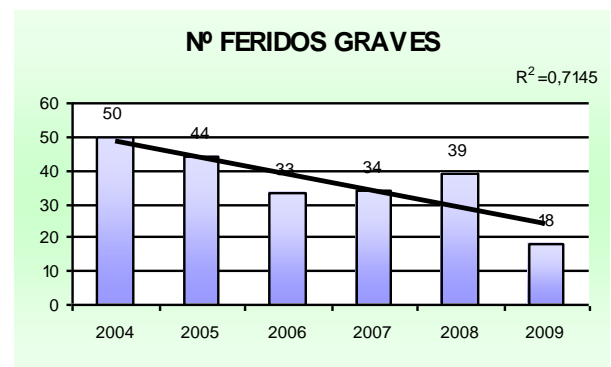
Serious injuries per category	2004	2005	2006	2007	2008	2009	Average
Total for all accidents	50	44	33	34	39	18	36
Passengers	11	7	8	5	6	4	7
Employees	3	0	2	2	2	2	2
LC users	12	15	9	8	10	5	10
Unauthorised persons	24	22	12	18	20	7	17
Others	0	0	2	1	1	0	1

As with fatalities, most serious injuries occur in accidents involving rolling stock in motion (47.2%), followed by accidents at LCs (27.8%).

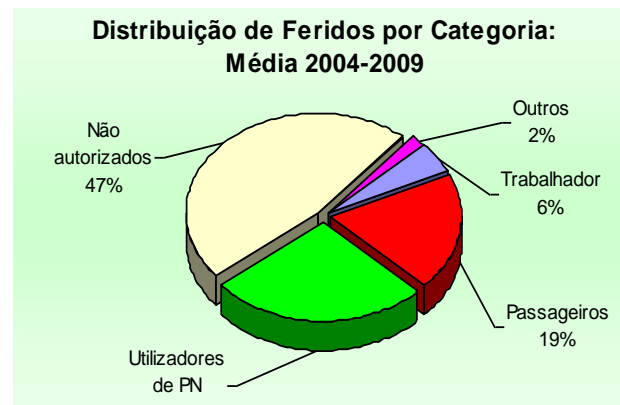
And in line with fatalities, serious injuries also showed a significant drop in 2009 (down 54%), confirming the downward trend over the last six years.

The distribution pattern for serious injuries is similar to that for fatalities, with the overwhelming majority of injuries suffered by unauthorised persons and level crossing users.

The average pattern of distribution over the period from 2004 to 2008 shows a significant number of injuries to passengers (19.4%), a much higher percentage than that for the number of fatalities, at around 2% of the total.



SERIOUS INJURIES



Average Distribution of Serious Injuries per Category: 2004-2009

Unauthorised 47% LC Users 27% Others 2%
Employees 6% Passengers 19%

D.3.5 – The risk for society

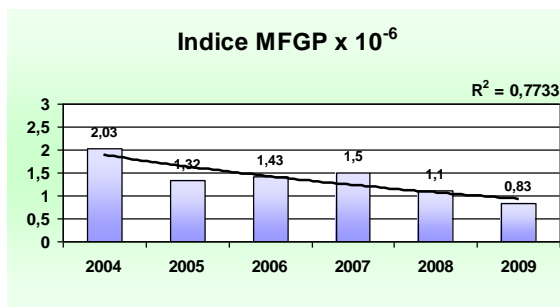
Fatalities per category	2004	2005	2006	2007	2008	2009	Average
Total for all accidents	2.03	1.32	1.43	1.5	1.1	0.83	1.37
Passengers	0.03	0.02	0.02	0.04	0.09	0.01	0.04
Employees	0.09	0.05	0.03	0.13	0.03	0.03	0.06
LC users	0.72	0.32	0.48	0.51	0.38	0.43	0.47
Unauthorised persons	1.19	0.9	0.9	0.82	0.6	0.36	0.8
Others	0	0.03	0.01	0	0	0	0.01

A useful method for analysing overall trends in railway accidents and the risks to which society is exposed by rail transport involves calculating a standard index that takes into account the number of fatalities and serious injuries during the year.

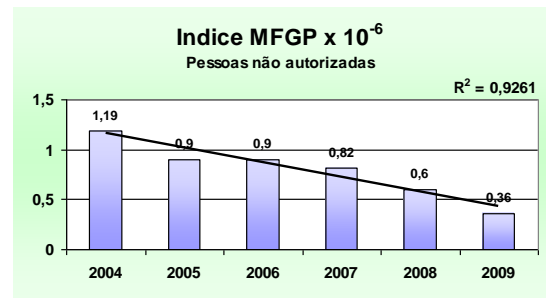
This indicator is calculated by dividing the total number of Fatalities and Weighted Serious Injuries (FWSI) by the number in millions of trains multiplied by kilometres travelled during the year under analysis. For the purposes of calculating the index, a weighted serious injury is considered to be statistically equivalent to 0.1 of a fatality.

The trend suggests a clear reduction over the past six years in the risk to society posed by the railway network.

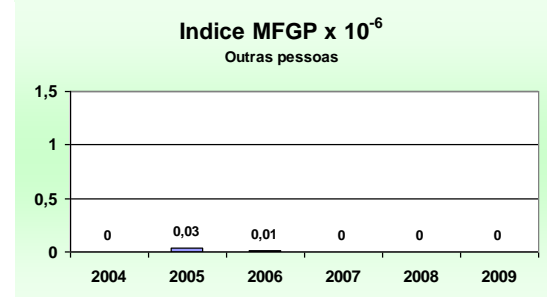
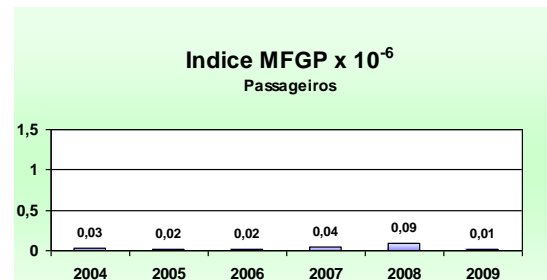
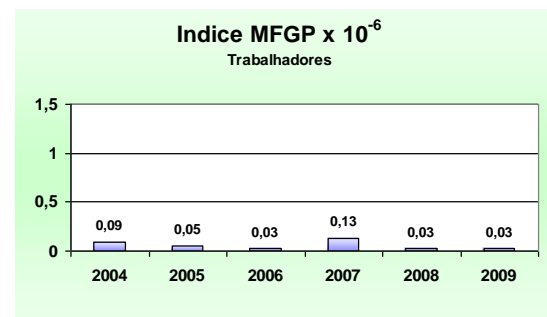
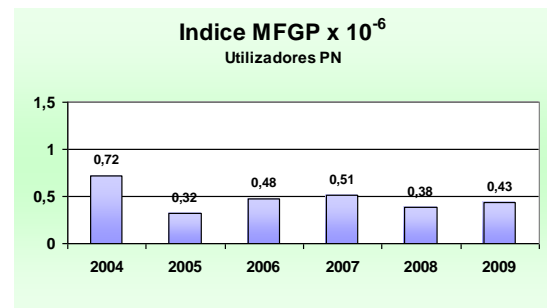
The different risk categories are shown in the following charts, indicating a clearly downward trend in the risk to those in the category “Unauthorised persons on railway property”.



Index MF GP x 10⁻⁶ = FWSI Index x 10⁻⁶
 Pessoas não autorizadas = Unauthorised persons
 Utilizadores PN = LC users
 Trabalhadores = Employees
 Passageiros = Passengers
 Outras pessoas = Other persons



FWSI index x 10⁻⁶
Unauthorised persons

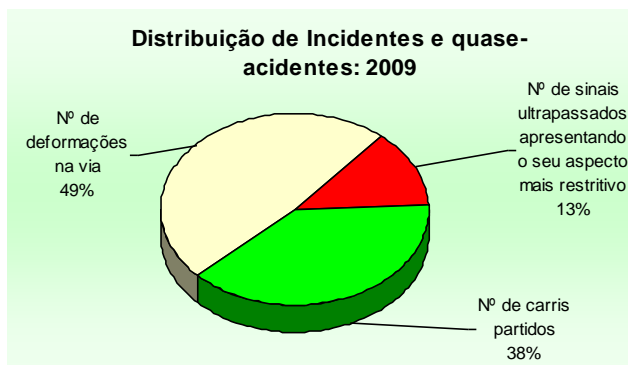


D.3.6 – Accident precursors

Incidents and near misses	2006	2007	2008	2009
Total number of incidents and near misses	168	100	94	91
Broken rails	45	39	33	35
Track buckles	95	40	37	44
Wrong side signalling failures	0	0	0	0
Signals passed at danger	24	20	24	12
Broken wheels on rolling stock	1	0	0	0
Faulty axles on rolling stock	3	1	0	0

The total number of incidents and near misses has been falling continually since 2006, (the first reference year), and by 2009 had dropped 46 %.

In terms of the distribution of incidents and near misses, in 2009 there were only three main categories, with track buckles responsible for almost half of the incidents recorded.



Distribution of incidents and near-misses: 2009
Track buckles 49%
Signals passed at danger 13%
Broken rails 38%

D.3.7 – Cost of accidents

Cost of accidents (EUR million)	2006	2007	2008	2009
Total cost	52.11	60.25	47.69	33.59
Fatalities	47.24	54.96	40.54	30.32
Injured	3.93	4.31	5.03	2.28
Cost of replacing or repairing damaged rolling stock and infrastructure	n.a.	n.a.	0.75	0.6
Cost of delays	0.94	0.98	1.37	0.39

The cost of accidents was determined using the method developed by the ERA for calculating common safety indicators. The method entails calculating the cost of accidents by taking account of the value society attributes to preventing accidents causing fatalities, serious injuries and delay to passenger and goods trains (see details in Annex C).

The figures were calculated by considering the values defined by Portugal in Tables 1, 2 and 3 of Annex C, corrected on a linear basis by the factor of growth in per capita GDP between 2002 and 2009, i.e. 1.18.

Bearing in mind that in 2009 there was a significant drop in the number of fatalities (the category with the highest proportional accident cost (90%)), costs in 2009 fell significantly in comparison to 2008 (- 30 %).



Distribution of cost of accidents 2009
Fatalities 90% Serious Injuries 7%
Repairs to RS & IF 2% Delays 1%

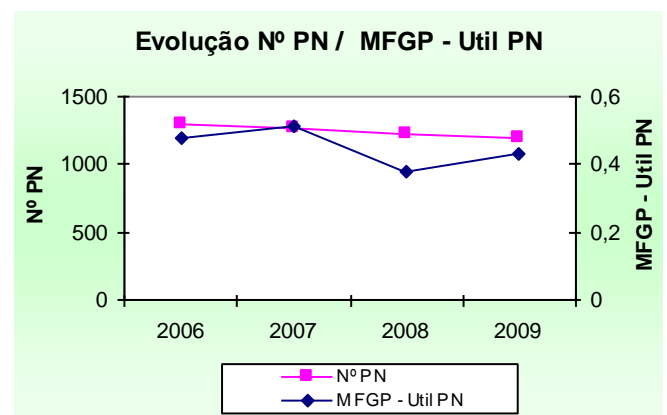
D.3.8 – Indicators relating to the technical safety of infrastructure and its implementation.

Indicators relating to the technical safety of infrastructure and its implementation	2006	2007	2008	2009
% of lines with Automatic Train Protection (ATP) systems in operation	50.3%	50.8%	51.3%	51.3%
% of ck carried out using operational ATP systems	90.0%	90.0%	90.0%	90.0%
Total number of LCs	1297	1266	1229	1191
Number of LCs per kilometre of track	0.37	0.36	0.35	0.34
Number of LCs per kilometre of line	0.46	0.45	0.43	0.42
% of LCs with automatic or manual protection	39.3%	38.2%	37.3%	39.7%

Indicators relating to the technical safety of infrastructure in 2009 show a slight improvement compared to previous years and a consistent improvement in technical safety on the railways over the last six years.

This improvement in the safety conditions of infrastructure may correlate with and have a direct influence on the downward trend in the number of accidents and victims recorded over the last six years.

As already mentioned, level crossings have not seen a significant reduction in risk, despite investments in modernisation and elimination. The chart shows changes in the number of level crossings and in the risks to which level crossing users are exposed.



Changes in number of LCs vs LC FWSI Index
No. PN = No. LCs
MFGP – Util PN = LC FWSI Index

E – RELEVANT AMENDMENTS TO LEGISLATION AND REGULATIONS

E.1 – National Legislation

The most significant legislative change with the greatest impact on the development of the railways sector in 2009 was Decree Law n.º 137-A/2009 of 12 June, which approved the legal regime applicable to CP - Comboios de Portugal, E. P. E., as well as the Articles of Association, and authorised the automation of goods transport activities, revoking Decree Law n.º 109/77, dated 25 March, which approved the Articles of Association of Caminhos de Ferro Portugueses, E. P.

Decree Law n.º 137-A/2009 set the seal on the creation of CP Carga – Logística e Transportes Ferroviários de Mercadorias, S.A., which began activities on 1 August when it was officially licensed and received safety certification, Parts A and B.

E.2 – Technical Safety Regulations

The most significant documents drawn up in developing compulsory technical safety regulations were the following:

- Addendum 40 to General Safety Regulations II – Signals

Establishes the protected area signal and the respective procedures to be followed by train personnel.

- Addendum 25 to General Safety Regulations III – Rail Traffic

Centralised command and control of traffic on a number of lines operated as blocks (Simplified Operating System).

- Addendum 35 to General Safety Regulations V – Train braking

Establishes conditions for movement of the vehicle at the tail of the train when the parking brake is defective.

- Addendum 26 to I 2837

Authorises implementation of a new system of protection at level crossings, consisting of 4 half-barriers and video-surveillance equipment.

- Addendum 27 to I 2837

Authorises the implementation of hinged barriers and ground-train radio equipment at level crossings.

- CSI 102/09

Reformulates the procedure for establishing temporary maximum speeds.

- IET 78

Establishes a report template for use by undertakings to draft annual safety reports.

- IET 79

Establishes definitions for analysing common safety indicators in accordance with ERA guidelines.

- ICET 179/09

Establishes definitions for analysing common safety indicators in accordance with ERA guidelines.

F – DEVELOPMENT OF SAFETY CERTIFICATION AND AUTHORISATION

F.1 – National Legislation

Decree Law No 231/2007, which introduced the amendments to Decree Law No 270/2003 necessary to transpose Safety Directive 2004/49/CE of 29.04.2006, came into force on 14 June 2007. That date therefore marked the beginning of a new scheme for the safety certification of rail transport undertakings, making it obligatory for the infrastructure manager to obtain safety authorisation for conducting management activities.

The relevant documentation for safety certification and authorisation procedures can be found on the IMTT website.

Other supporting documentation that may be required for applications, such as a list of railway-related legislation and regulations, was published in the Network Directory (REFER). Applicants can obtain these safety regulatory documents from REFER on request.

F.2 – Numerical data

Portugal issued its first Railway Safety Certificate in 2007 in response to an application submitted by the rail transport undertaking Fertagus on 10 November 2006. The certificate was issued on 10 May 2007 under the safety certification arrangements created by Decree Law No 270/2003, which transposed Directive 2001/14/EC of 26 February.

Parts A and B of the first safety certificates were issued in 2008 by the IMTT, in accordance with the new legal regime. In 2009, there were developments in the activities of rail transport undertakings, which led to significant changes in safety certification procedures.

Part A of the Safety Certificate was awarded to CP Carga as a result of its split from CP Comboios de Portugal, and this first certificate was also renewed.

A total of 11 Part B Safety Certificates were awarded as follows: to Portuguese undertakings TAKARGO (8) and CP Carga (2), and to the Spanish undertaking COMSA Rail (1).

In regard to Safety Authorisations, railway infrastructure management undertaking REFER did not submit any applications to IMTT during 2009.

Numeric data concerning safety certifications and authorisations are given in Annex E.

F.3 – Procedural aspects

Applications for Safety Certificate Part A, confirming the existence of an approved safety management system, are assessed according to criteria harmonised at European level in 2008 and developed by a European Railway Agency Working Group in which the IMTT plays a part.

Applications for Safety Certificate Part B were examined according to assessment criteria set out in documents produced by the above-mentioned ERA Working Group and in Commission Regulation (EC) No 653/2007 of 13 June 2007 (On the use of a common European format for safety certificates and application documents in accordance with Article 10 of Directive 2004/49/EC of the European Parliament and of the Council and on the validity of safety certificates issued under Directive 2001/14/EC).

The time taken for assessing applications and issuing certificates was reduced considerably, thanks to effective dialogue and closer relations between IMTT and the railway undertakings, and was well below the legally permitted period of 4 months.

G – SUPERVISION OF RAIL TRANSPORT UNDERTAKINGS AND OF THE INFRASTRUCTURE MANAGER

G.1 – Description of supervision

Various procedures are used in supervising the activities of the infrastructure manager and railway undertakings:

- Analysis of occurrences recorded in the Daily Traffic Report drawn up by REFER;
- Planned monitoring;
- Monitoring initiated after analysing events relating to accidents or incidents, claims/complaints or board of enquiry recommendations;
- Safety Management System audits.

Monitoring is always carried out by IMTT staff, who may ask personnel from the undertakings under inspection for assistance in carrying out the work necessary for such monitoring.

G.2 – Annual safety reports by rail transport undertakings and the infrastructure manager

April 2009 saw the publication of regulatory documents setting out the framework necessary to harmonise the way in which all undertakings submit their annual safety reports. The documents published were: IET 78 – Report Template, IET 79 – Definitions for the analysis of common safety indicators, and ICET 179 - Table of Common Safety Indicators. These documents follow the recommendations and guidelines produced by the European Railway Agency.

In compliance with their legal obligations, the undertakings produced and submitted their safety reports for 2009 to the IMTT. All the

reports except one were delivered within the legal deadline, and the overdue report was submitted very shortly after the deadline.

In regard to compliance with the legal requirements concerning the content of the report, the quality and format of the information provided was generally compliant with the regulatory requirements, making the reports easier to understand and analyse.

G.3 – Supervision activities

During 2009, supervision and inspection activities were conducted by monitoring events in railway operation on a daily basis or by using 10 monitoring procedures. The main operations are detailed below:

- Monitoring the performance of its railway operations and verifying compliance with the requirements that TAKARGO must satisfy to obtain and maintain its Safety Certificate.
- Monitoring the performance of railway operations and compliance with the safety standards of CP's goods transport activities.
- Monitoring the performance of railway operations and compliance with the safety standards of CP's passenger transport activities.
- Supervision to verify the completion of the existing pedestrian walkway and examine the actual conditions at the Estoril station providing access to boarding and disembarkation platforms.
- Supervision to verify the actual conditions under which passengers crossed from one platform to another at two stations –

Santarém and Entroncamento – both handling very heavy rail traffic.

- Monitoring the performance of railway operations and compliance with the standards by FERTAGUS.
- Supervision to verify actual signalling conditions in respect of maximum speeds, and especially in regard to train departures from the Rossio station.

Each of these activities was conducted by 2 staff members of the 4 people who normally carry out this type of work, which takes up around 5% of working hours for Railway Infrastructure and Equipment Department staff.

- Fitting rolling stock with the equipment necessary for increasing safety when shunting, and consisting of portable radios compatible with the ground-train system, portable signalling lanterns, individual protective equipment, etc.

- Improved maintenance processes and shorter repair times for railcars.

- An improved solution for completion of a pedestrian level crossing at Estoril station, enhancing the station's safety.

- Improved fixed signalling at the Rossio station.

- Improved passenger circulation, crossings and information at the Santarém and Entroncamento stations.

G.4 – Corrective action

As a result of supervisory and inspection activities, both the infrastructure manager and transport undertakings implemented corrective actions, such as:

H – Application of the Common Safety Method for Risk Identification and Assessment

There were no concrete instances in 2009 of the application of the Common Safety Method.

I – Conclusions

In terms of railway safety, occurrences worth noting for 2009 included the following:

- There were sharp drops in the number of significant accidents (- 41 %), the number of fatalities (- 23%) and in the overall risk (FWSI: - 24.5%) by comparison with 2008.
- The number of suicides continued to increase and rose 38 % by comparison with 2008
- There was a serious accident leading to 6 fatalities and 1 serious injury when a road vehicle was negotiating an unattended level crossing on the Douro line.
- By comparison with 2008, the number of signals passed at danger dropped 50% in 2009.
- Traffic continued to be suspended for safety reasons along most of the Tua line, on the Corgo and Tâmega lines and on the Figueira da Foz branch line.
- Progress continued to be made on safety certification processes for rail transport undertakings, with two new rail goods transport operators commencing operations (COMSA RAIL and CP CARGA), and development of the activities of the operator certificated in 2008.

The figures for safety indicators over the past six years show some marked improvements, such as the downward trend in the overall number of accidents and the number of victims. The main factor in this positive trend is the drop in the number of accidents in the one category in which they are most frequent: accidents to persons caused by rolling stock in motion.

However, on the negative side, suicides continue to show an upward trend.

Improvements in the technical safety of the infrastructure continued in 2009, mainly as a

result of further investments made to eliminate and reclassify level crossings.

In 2009, no significant legislation was produced concerning rail safety. In terms of safety management, further efforts were made in applying the legislation published in 2007 (Decree Law nº 231/2007 of 14 June), which transposed the Safety Directive. This resulted in the issuing of two Part A safety certificates and eleven Part B certificates.

As in 2008, 2009 saw no significant developments in regard to the certification of the safety management systems of undertakings that are already in operation and do not yet have this certification.

IMTT railway safety priorities for 2010/2011 include the following:

- to complete and publish the regulations defined in Decree Law nº 231/2007 of 14 June, necessary for implementing safety certification and authorisation, i.e.:
- regulations on the approval of Safety Management Systems;
- regulations on the approval of Common Emergency Procedures.
- regulations on training, exams and issuing of certificates to staff with relevant safety duties, with the exception of machine workers..
- to conclude the updating of the Technical Safety Regulations;
- to continue to support undertakings in developing their safety management systems by disseminating and clarifying the results of work carried out by the ERA;
- to cooperate with undertakings in identifying the most problematic aspects of railway safety with a view to taking action to reduce the number of accidents involving third parties;



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- to increase the number of inspections and improve controls on the implementation of corrective measures;
- to cooperate with rail transport undertakings in identifying the underlying causes of signals passed at danger (SPAD).

J – BIBLIOGRAPHY

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- Recommendation to revise Annex 1 to Directive 2004/49 - WG on Common Safety Indicators/Safety Performance
- Guidance for use of CSI's recommendation - WG on Common Safety Indicators/Safety Performance
- Annual Safety Report 2009 – REFER
- Annual Safety Report 2009 – CP – COMBOIOS DE PORTUGAL
- Annual Safety Report 2009 – CP CARGA
- Annual Safety Report 2009 – FERTAGUS
- Annual Safety Report 2009 – TAKARGO
- “*Destaque*”, INE, 11 March 2010



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L - ANNEXES

ANNEX A – INFORMATION ON THE STRUCTURE OF THE RAILWAY SYSTEM

ANNEX B – INFORMATION ON THE ORGANISATION OF THE IMTT

ANNEX C – COMMON SAFETY INDICATORS AND DEFINITIONS USED

ANNEX D – AMENDMENTS TO LEGISLATION AND REGULATIONS

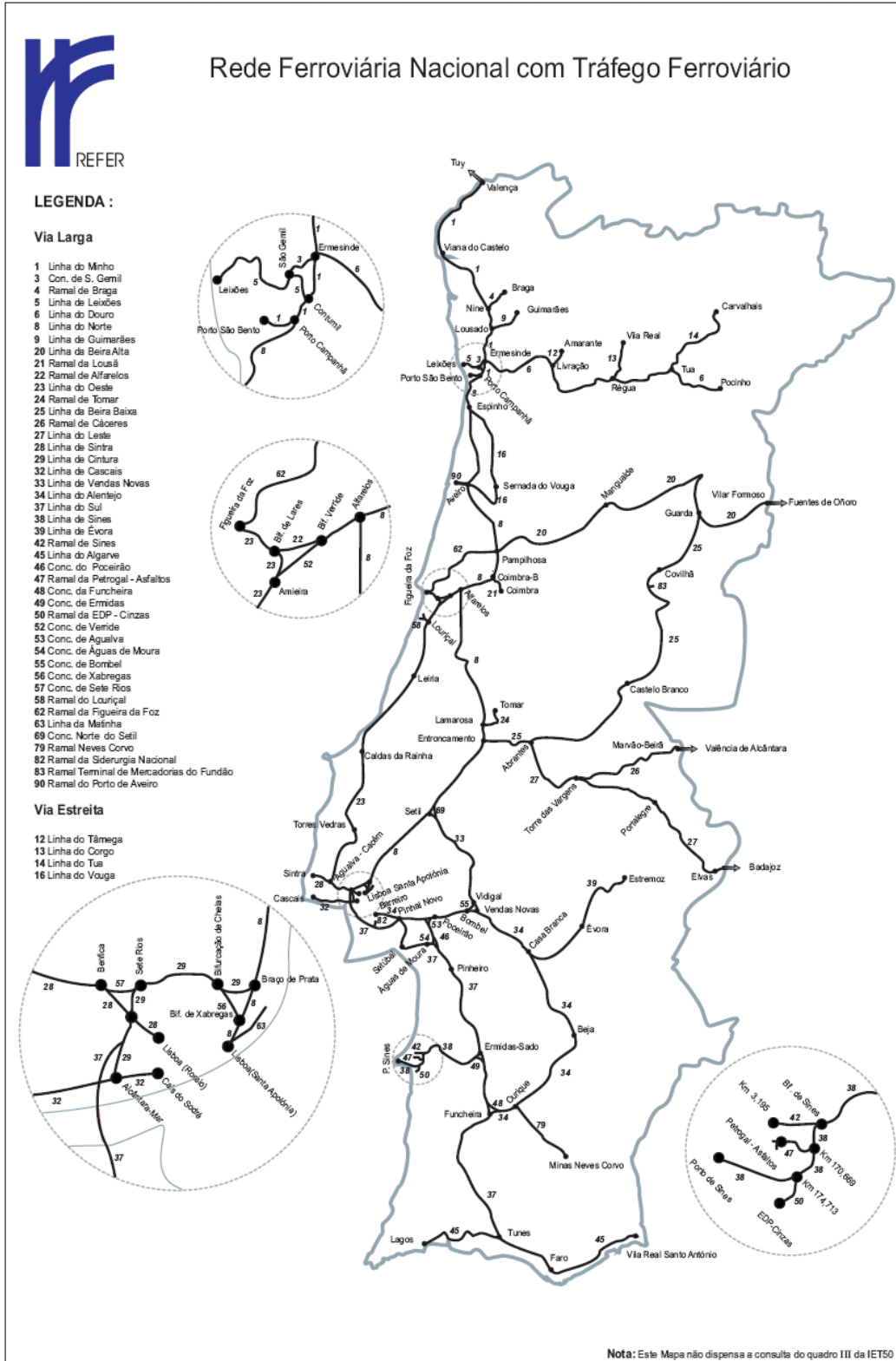
ANNEX E – DEVELOPMENT OF SAFETY CERTIFICATION AND AUTHORISATION

ANNEX A

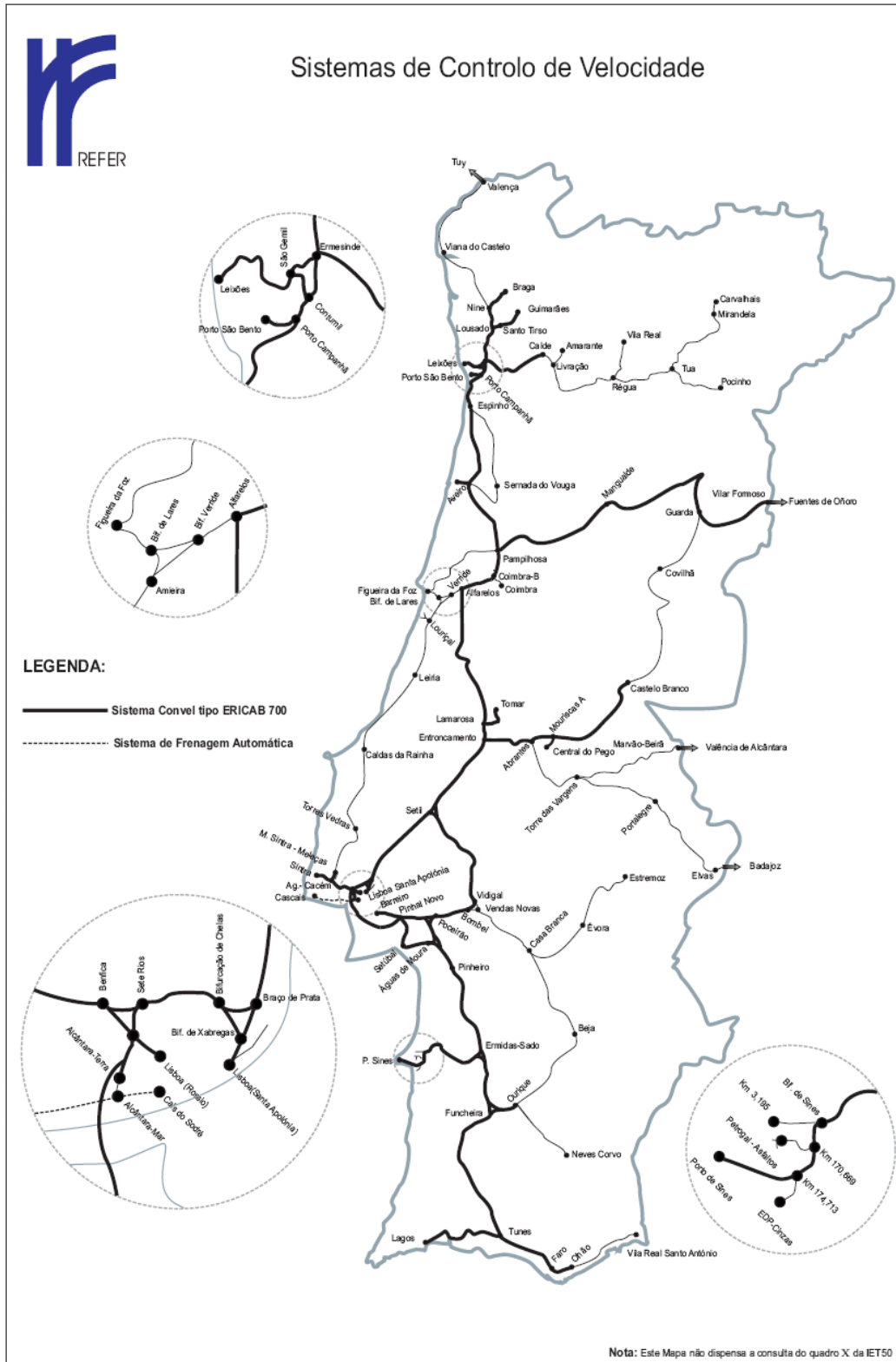
INFORMATION ON THE STRUCTURE OF THE
RAILWAY SYSTEM

2009

A.1 – Map of the National Railway Network



A.1.1 – Map of Automatic Speed Control Systems



Key to Map A.1 above:

Anexo 1 – Linhas e Ramais com Tráfego Ferroviário	Annex 1 – Lines and branches open to rail traffic
Legenda	Key
Via larga	Broad gauge
Via estreita	Narrow gauge

Key to Map A.1.1 above:

Anexo 7 – Sistemas de Controlo de Velocidade	Annex 7 – Speed control systems
Legenda	Key
Sistema Convel tipo ERICAB 700	ERICAB 700 Convel system (ATP)
Sistema de Frenagem Automática	Automatic braking system

A.2 – List of infrastructure management and rail transport undertakings

A.2.1 – Infrastructure Manager

Description	Information
Name	REFER, Rede Ferroviária Nacional, E.P.
Address	Estação de Santa Apolónia, 1100-105 Lisbon, Portugal
Website	www.refer.pt
Safety Authorisation (DL No 270/2003, as amended by Decree Law No 231/2007 of 14 June)	Not yet issued
Date of commencement of activity	29 April 1997
Length of network open to traffic	Total: 2 841.6 km Broad gauge track (1 668 mm gauge): 2,649.9 km Narrow gauge track (1 000 mm gauge): 191.7 km
Length of lines by number of tracks	Multiple track: 607.3 km Single track: 2 234.2 km
Length of electrified network	Total: 1 460.2 km 25 000 V _{AC} : 1 434.7 km 1 500 V _{DC} : 25.5 km % of network open to traffic: 51.4%
Length of lines equipped with CONVEL/ATP:	1 459.1 km % of network open to traffic: 51.3%
Length of lines equipped with ground-train radio:	1 428 km % of network open to traffic: 50.3%
Number of level crossings (including private and pedestrian)	1 191 Density: 0.42 LC / km of line 0.34 LC / km of track
Level crossings with automatic or manual protection	473 % of total LC: 39.7%
Number of trains on network	Total: 810 452 (includes empty stock movements) Passengers: 574 067 Goods: 131 268 Empty stock movements: 105 117
Train km run on network (tk)	Total: 40.6 x 10 ⁶ Passenger: 33.4 x 10 ⁶ Goods: 7.2 x 10 ⁶
% tk with CONVEL/ATP in operation	90%
No. of hours worked on company business	6 068 271

A.2.2 – Railway Undertakings

A.2.2.1 – CP – Caminhos-de-ferro Portugueses, E.P.E.

Description	Information
Name	CP – Caminhos-de-ferro Portugueses, E.P.E.
Address	Calçada do Duque, n.º 20 1249-109 Lisbon Portugal
Website	www.cp.pt
Licence to begin activity (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Not yet awarded
Safety certificate (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Not yet awarded
Date of commencement of activity	9 May 1951
Type of traffic	Passenger and goods
Number of locomotives	Total: 152, Diesel: 83, Electric: 69
Number of railcars	Total: 279, Diesel: 76, Electric: 203
Number of carriages	129
Number of wagons	3046* up to 31 July for transfer to CP Carga
Number of drivers	985
Number of driver's assistants	121
Number of commercial operators with safety-related responsibilities	656
Number of trains used	Total: 605 785 (includes empty stock movements) Passenger: 569 091 (includes empty stock movements) Goods: 36 694 (includes empty stock movements)*
Train km travelled (tk)	Total: 39.9 x 10 ⁶ Passengers: 31.6 x 10 ⁶ Goods: 8.3 x 10 ⁶
% of tk travelled with CONVEL / ATP in operation	99.7%
Number of passenger km (pk)	3766 x 10 ⁶
Number of tonnes km (tonne.k)	1 177 x 10 ⁶ * - up to 21 July
Number of hours worked on company business	7 103 043

A.2.2.2 – FERTAGUS, S.A.

Description	Information
Name	FERTAGUS, Travessia do Tejo, Transportes, S.A.
Address	Estação do Pragal Porta 23 2805-333 Almada Portugal
Website	www.fertagus.pt
Licence for commencement of activity (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Licence no. 01 of 1 June 2006
Safety certificate (DL No 270/2003 of 28 October)	Safety Certificate 1/2007
Date of commencement of activity	29 July 1999
Type of traffic	Passenger
Number of railcars	Electric: 18
Number of drivers	44
Number of driver's assistants	Not applicable
Number of commercial operators with safety-related responsibilities	77
Number of trains	Passenger: 56 234 (includes empty stock movements)
Train km travelled (tk)	Passenger: 1 778 x 10 ⁶
Number of passenger km (pk)	385. 584 x 10 ⁶
% of tk travelled with CONVEL/ATP in operation	99.98%
Number of hours worked on company business	323 560 h

A.2.2.3 – TAKARGO, Transporte de Mercadorias, S.A.

Description	Information
Name	TAKARGO, Transporte de Mercadorias, S.A.
Address	Rua Mário Dionísio, n.º 2 2799 – 557 Linda-a-Velha Portugal
Website	Not available
Licence for commencement of activity (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Licence no. 2 of 1 March 2008
Safety Certificate (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Safety Certificate: Part A - PT 11 2008 0001 Part B - PT 12 2008 0001
Date of commencement of activity	25 September 2008
Type of traffic	Goods
Number of locomotives	Diesel: 9
Number of wagons	138
Number of drivers	14
Number of driver's assistants	10
Number of trains	Goods: 1882 (includes empty stock movements)
Train km travelled (tk)	Goods: 284 029 x 10 ⁶
Number of tonnes x km (tk)	94.8 x 10 ⁶
% of tk travelled with CONVEL/ATP in operation	79%
Number of hours worked on company business	106 156 h

A.2.2.3 – CP Carga – Logística e Transporte Ferroviário de Mercadorias S.A.

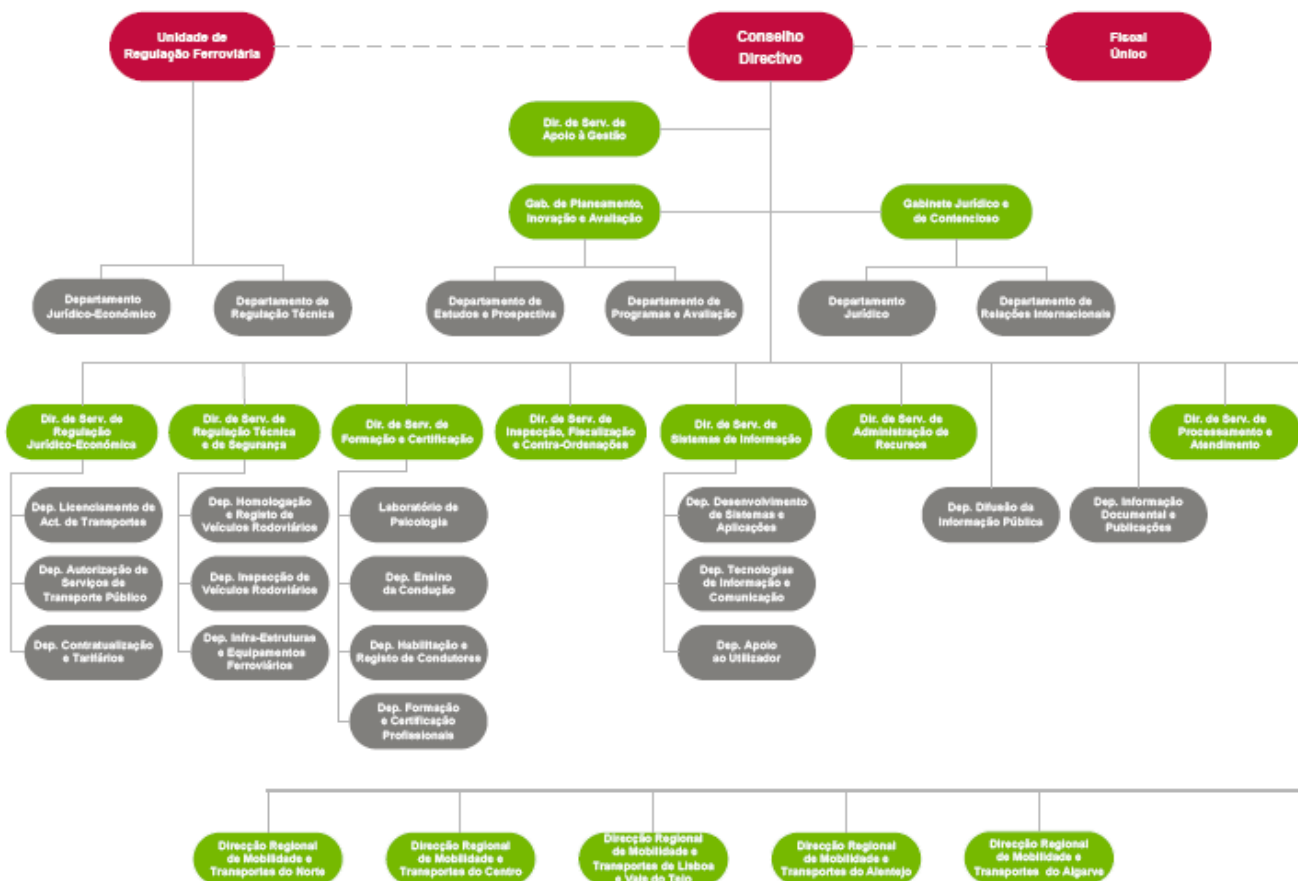
Description	Information
Name	CP Carga – Logística e Transporte Ferroviário de Mercadorias S.A.
Address	Calçada do Duque, n.º 20 1249-110 Lisbon Portugal
Website	www.cpcarga.pt
Licence for commencement of activity (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Licence: PT 01 2009 01 – Domestic Transport PT 01 2009 02 – International Transport
Safety Certificate (DL No 270/2003, as amended by DL No 231/2007 of 14 June)	Part A – PT 11 2009 0002 Part B – PT 12 2009 0012
Date of commencement of activity	1 August 2009
Type of traffic	Goods
Number of locomotives	Total: 73 Diesel: 36 Electric: 37
Number of wagons	3046
Number of drivers	268
Number of driver's assistants	169
Number of trains	Goods: 26 615
Train km travelled (tk)	Goods: 2.8 x 10 ⁶
% of tk travelled with CONVEL/ATP in operation	99.9 %
Number of tonnes x km (tk)	872.5 x 10 ⁶
Number of hours worked on company business	606 755

ANNEX B

INFORMATION ON THE ORGANISATION OF THE
IMTT

2009

B.1 – Organisational structure of the IMTT

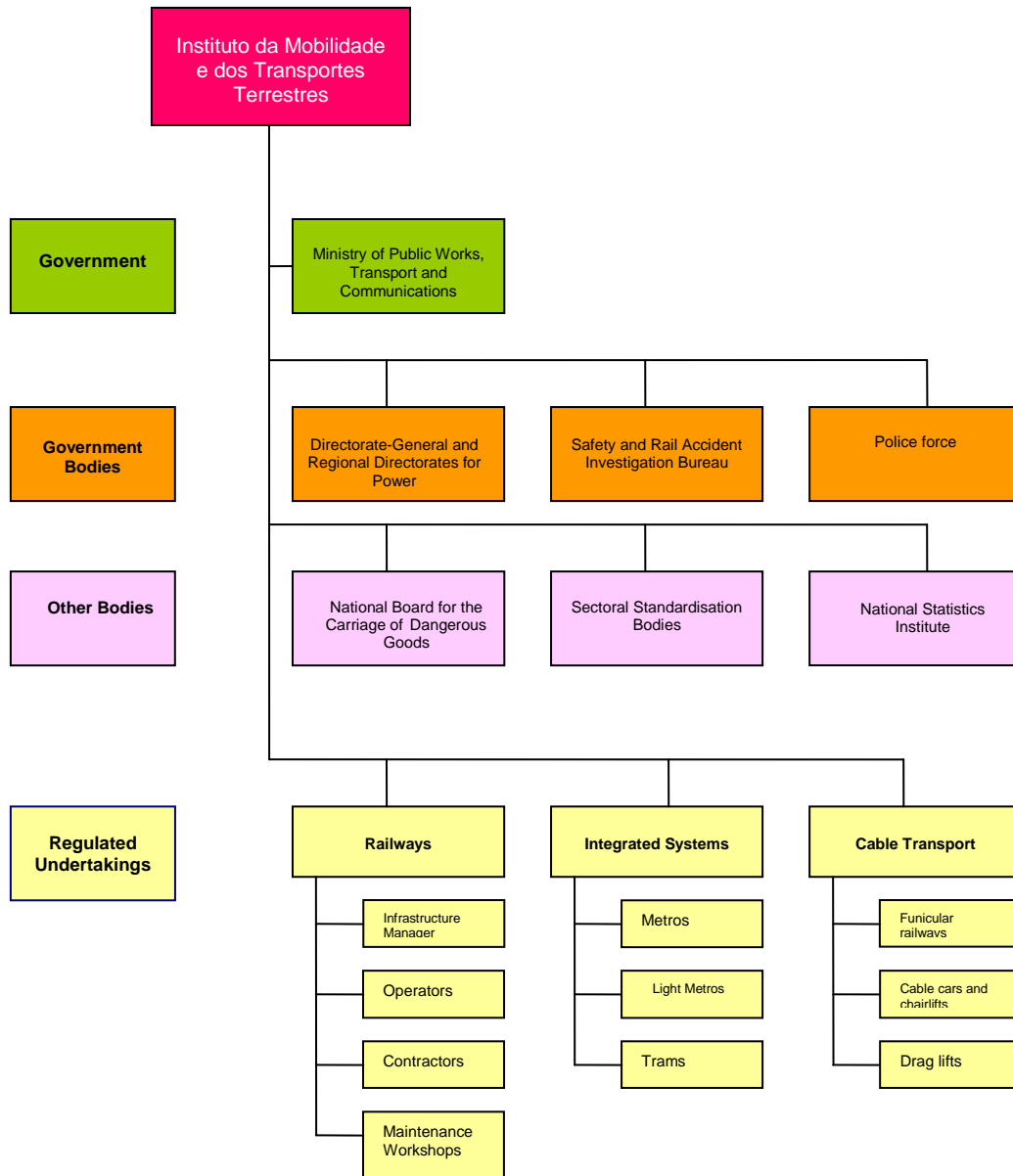




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Unidade de Regulação Ferroviário	Railway Regulatory Unit
Conselho Directivo	Board of Directors
Fiscal Unloo	Inspectors
Div. de Serv. de Apoio à Gestão	Management Support Division
Gab. de Planeamento, Inovação e Avaliação	Planning, Innovation and Assessment Bureau
Gabinete Jurídico e de Contencioso	Legal Affairs and Litigation Office
Departamento Jurídico-Económico	Department for Legal and Economic Affairs
Departamento de Regulação Técnica	Technical Regulatory Department
Departamento de Estudos y Prospectiva	Department for Research and Future Development
Departamento de Programas e Avaliação	Programme and Assessment Department
Departamento Jurídico	Legal Department
Departamento de Relações Internacionais	Department for International Relations
Div. de Serv. de Regulação Jurídico-Económico	Legal and Economic Affairs Regulatory Services Division
Div. de Serv. de Regulação Técnica e de Segurança	Technical and Safety Regulatory Services Division
Div. de Serv. de Formação e Certificação	Training and Certification Division
Div. de Serv. de Inspeção, Fiscalização e Contra-Ordenações	Inspection, Monitoring and Administrative Offences Division
Div. de Serv. de Sistemas de Informação	Information Systems Division
Div. de Serv. de Administração de Recursos	Resources Administration Division
Div. de Serv. de Processamento e Atendimento	Processing and Customer Services Division
Dep. Licenciamento de Act. de Transportes	Transport Licensing Department
Dep. Homologação e Registo de Veículos Rodoviários	Road Vehicle Authorisation and Registration Department
Laboratório de Psicologia	Psychology Laboratory
Dep. Desenvolvimento de Sistemas e Aplicações	Department of Systems and Applications Development
Dep. Difusão de Informação Pública	Public Information Department
Dep. Informação Documental e Publicações	Documentary Information and Publications Department
Dep. Autorização de Serviços de Transportes Públicas	Public Transport Services Authorisation Department
Dep. Inspeção de Veículos Rodoviários	Road Vehicle Inspection Department
Dep. Ensino da Condução	Driver Training Department
Dep. Tecnologias de Informação e Comunicação	Information and Communication Technology Department
Dep. Contratualização e Tarifários	Department of Contracting and Pricing
Dep. Infra-Estruturas e Equipamentos Ferroviários	Railway Infrastructure and Equipment Department
Dep. Habilitação e Registo de Condutores	Driver Testing and Registration Department
Dep. Apoio ao Utilizador	User Support Department
Dep. Formação e Certificação Profissionais	Vocational Training and Certification Department
Direcção Regional de Mobilidade e Transportes do Norte	Regional Directorate for Mobility and Transport (North)
Direcção Regional de Mobilidade e Transportes do Centro	Regional Directorate for Mobility and Transport (Centre)
Direcção Regional de Mobilidade e Transportes de Lisboa e Vale do Tejo	Regional Directorate for Mobility and Transport (Lisbon and Vale do Tejo)
Direcção Regional de Mobilidade e Transportes do Alentejo	Regional Directorate for Mobility and Transport (Alentejo)
Direcção Regional de Mobilidade e Transportes do Algarve	Regional Directorate for Mobility and Transport (Algarve)

B.2 – IMTT relations with other bodies in connection with railway safety



ANNEX C

COMMON SAFETY INDICATORS AND
DEFINITIONS USED

2009

C.1 – Common Safety Indicators 2009

Number of accidents and breakdown by type		Per million tk
Total of all accidents	43	1.06
Train collisions, including collisions with obstacles within the clearance gauge	0	0
Train derailments	1	0.02
Accidents at level crossings (LCs), including accidents involving pedestrians	15	0.37
Accidents to persons caused by rolling stock in motion, excluding suicides	27	0.67
Fires in rolling stock	0	0
Other accidents	0	0

Total number of suspected suicides		Per million tk
Suicides	69	1.7

Number of fatalities and breakdown by type of victim		Per million tk	Per million pk
Total number of fatalities	32	0.79	
Passengers	0	0	0
Employees (including the staff of contractors)	1	0.02	
Level crossing (LC) users	17	0.42	
Unauthorised persons on railway property	14	0.34	
Others	0	0	

Number of fatalities and breakdown by type of accident		Per million tk
Total number of persons killed	32	0.79
In train collisions	0	0
In train derailments	0	0
In accidents at LCs, including accidents involving pedestrians	17	0.42
In accidents to persons caused by rolling stock in motion, excluding suicides	15	0.37
In fires in rolling stock	0	0
In other accidents	0	0

Number of serious injuries and breakdown by type of victim		Per million tk	Per million pk
Total number of serious injuries	18	0.44	
Passengers	4	0.1	0.001
Employees (including the staff of contractors)	2	0.05	
Level crossing (LC) users	5	0.12	
Unauthorised persons on railway premises	7	0.17	
Others	0	0	

Number of serious injuries and breakdown by accident type		Per million tk	
Total number of serious injuries	18	0.44	
In train collisions, including collisions with obstacles within the clearance gauge	0	0	
In train derailments	0	0	
In accidents at LCs, including accidents involving pedestrians	5	0.12	
In accidents to persons caused by rolling stock in motion, excluding suicides	13	0.32	
In fires in rolling stock	0	0	
In other accidents	0	0	

Number of incidents and near-misses and breakdown by type		Per million tk	
Total number of incidents and near-misses	91	2.24	
Broken rails	35	0.86	
Track buckles	44	1.08	
Wrong-side signalling failures	0	0	
Signals passed at danger	12	0.3	
Wheels broken in rolling stock during operation	0	0	
Faulty axles in rolling stock during operation	0	0	

Cost of accidents (million euros)		Per million tk	
Total cost	33.59	0.83	
Cost of fatalities	30.32	0.75	
Cost of injuries	2.28	0.06	
Cost of replacing or repairing damaged rolling stock or infrastructure	0.6	0.01	
Cost of delays, disruptions and rerouting of traffic, including additional personnel expenditure and loss of profits	0.39	0.01	

Indicators relating to technical safety of infrastructure and its implementation	
% of lines with Automatic Train Protection systems (ATP) in operation	51.3%
% tk travelled using ATP systems in operation	90.0%
Total number of LCs	1191
No of LCs per kilometre of track	0.34
No of LCs per kilometre of line	0.42
% LCs with automatic or manual protection	39.7%

Reference data	
No of train km (million tk)	40.58
No of passenger km (million pk)	4151.8
No of km of track (km of multiple lines multiplied by no of tracks)	3527.724
No of km of line used	2841.588
Total number of hours worked	15647870

Table C.1.1 – Summary of Common Safety Indicators

C.2 – Definitions used

The definitions and methods developed by the European Railway Agency's 'Safety Performance and Monitoring' Working Group were used to determine the Common Safety Indicators. This set of definitions includes those set out in Regulation (EC) No. 91/2003 (Railway Statistics) and in Directive 2004/49/EC (Safety).

Suspected suicides were used for the suicides indicator because, although the record of the circumstances in which the fatality occurred suggested an 'act to deliberately injure oneself resulting in death', the competent authorities had not at that time classified the act as suicide.

The costs of accidents resulting in persons killed and injured were calculated using the method developed under a Community project (HEATCO – Developing Harmonised European Approaches for Transport Costing and Project Assessment), which takes account of the value society attributes to preventing deaths and injuries in railway accidents.

The method used in the HEATCO project, which is based on the value of time, for both passenger and goods transport, was also adopted for assessing delays.

Definitions of accidents

'Significant accident' means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded. (Regulation (EC) No 91/2003).

'Accident' means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons

caused by rolling stock in motion, fires and others. (Directive 2004/49/EC (Safety))

Definitions for calculating Common Safety Indicators for accidents

1. 'Train' means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is not considered to be a train. (Regulation (EC) No 1192/2003)

After discussion with the CSI WG, Eurostat proposed an amendment to this definition:

'Train' means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is not considered to be a train, *except for the purposes of Annex H.*

The latter definition was adopted for determining CSIs.

2. 'Collisions of trains, including collisions with obstacles within the clearance gauge' means a collision which may be: head-on between trains; between the front and rear of two trains; between a train and any part of another train within the clearance gauge; or the collision of a train involving:

- a. shunting movements;
- b. fixed objects such as catch points;
- c. objects temporarily present at or near the track (except at level crossings, if lost by a road vehicle or pedestrian), such as stones, landslides, trees, parts lost by railway vehicles, road vehicles and machinery or equipment used in maintaining railway lines.

3. **'Derailment'** means any situation in which at least one wheel of a train leaves the rails.
4. **'Accidents at level crossings'** means accidents at level crossings involving: at least one rail vehicle and one or more road vehicles; other level crossing users such as pedestrians or objects at or near the track, if lost by a vehicle or LC user.
5. **'Accidents to persons caused by rolling stock in motion'** means accidents to one or more persons who are either hit by a railway vehicle or by an object attached to it or that has become detached from the vehicle. Persons who fall from railway vehicles are included, as well as persons who fall or who are hit by loose objects when travelling on trains.
6. **'Suicide'** means an act to deliberately injure oneself resulting in death, as recorded and classified by the competent national authority. (Regulation (EC) No 1192/2003)
7. **'Fires in rolling stock'** means fires or explosions occurring in railway vehicles (including their load), when they are running between the departure station and the destination, including both, and during intermediate stops and re-marshalling operations during the journey.
8. **'Other types of accidents'** means all accidents other than those classified as: collisions; derailments at LC; accidents to persons caused by rolling stock in motion; fires in rolling stock; suicides.
9. **'Rail passenger'** means any person, excluding members of the train crew, who makes a trip by rail. For accident statistics, passengers trying to embark/disembark onto/from a moving train are included. (Regulation (EC) No 1192/2003).
10. **'Employee (the staff of contractors are included)'** means any person whose employment is related to the railway and who is on duty at the time of the accident. This includes train crew and persons working with rolling stock or infrastructure installations.
11. **'LC users'** means all persons using a level crossing to cross the railway line by any means of transport or on foot.
12. **'Unauthorised persons on railway premises'** means any person present on railway premises where such presence is forbidden, with the exception of LC users.
13. **'Others (third parties)'** means all persons not defined as 'passengers', 'employees including the staff of contractors', 'LC users' or 'unauthorised persons on railway premises'.
14. **'Deaths (killed person)'** means any person killed immediately or dying within 30 days as a result of an accident, excluding suicides. (Regulation (EC) No 1192/2003)
15. **'Injuries (seriously injured person)'** means any person injured who was hospitalised for more than 24 hours as a result of an accident, excluding attempted suicides. (Regulation (EC) no 1192/2003)
16. **'Incident'** means any occurrence, other than accident or serious accident, associated with the operation of trains and affecting the safety of operation.
17. **'Broken rails'** means any rail which is separated in two or more pieces, or any rail from which a piece of metal becomes detached, causing a gap of more than 50 mm in length and more than 10 mm in depth in the running surface.
18. **'Track buckles'** means faults related to the continuum and the geometry of track, requiring track obstruction or immediate reduction of speed to maintain safety.
19. **'Wrong-side signalling failure'** means any failure of a signalling system (either to infrastructure or to rolling stock), resulting in signalling information less restrictive than that demanded.
20. **'Signal passed at danger' (SPAD)** means any occasion when any part of a train proceeds beyond its authorised movement.

21. **'Broken wheels and axles'** means a break affecting the essential parts of the wheel or the axle and creating a risk of accident (derailment or collision).

Definitions and methods for calculating indicators relating to the consequences of accidents

22. Cost of persons killed and injured (Value of Preventing a Casualty – VPC)

The methodology developed by the HEATCO project (Developing Harmonised European Approaches for Transport Costing and Project Assessment) is recommended for calculating indicators relating to the impact of accidents (persons killed and injured). This uses the concept of **VPC (Value of Preventing a Casualty)**, the two components of which are:

- a) **Value of safety *per se***: Willingness to Pay (WTP) – values based on stated preference studies carried out in the Member State for which they are applied.
- b) **Direct and indirect economic costs**: cost values appraised in the Member State, composed of:
 - medical and rehabilitation cost;
 - legal court cost, cost for police, private crash investigations, the emergency service and administrative costs of insurance;
 - production losses (value to society of goods and services that could have been produced by the person if the accident had not occurred).

Local values must be used whenever possible for a) and b), provided they have been developed by means of an appropriate methodology. If these are not available, the figures in Table 1 can be used, as in this report.

The reference year for the figures in Table 1 is 2002. These figures must be updated on a linear basis in accordance with growth in per capita GDP for the year of calculation.

Country	a) Value of safety per se			b) Direct and indirect costs			VPC (a+b)		
	Fatality	Severe injury	Slight injury	Fatality	Severe injury	Slight injury	Fatality	Severe injury	Slight injury
Austria	1,600,000	208,000	16,000	160,000	32,300	3,000	1,760,000	240,300	19,000
Belgium	1,490,000	194,000	14,900	149,000	55,000	1,100	1,639,000	249,000	16,000
Cyprus	640,000	83,000	6,400	64,000	9,900	400	704,000	92,900	6,800
Czech Republic	450,000	59,000	4,500	45,000	8,100	300	495,000	67,100	4,800
Denmark	2,000,000	260,000	20,000	200,000	12,300	1,300	2,200,000	272,300	21,300
Estonia	320,000	41,000	3,200	32,000	5,500	200	352,000	46,500	3,400
Finland	1,580,000	205,000	15,800	158,000	25,600	1,500	1,738,000	230,600	17,300
France	1,470,000	191,000	14,700	147,000	34,800	2,300	1,617,000	225,800	17,000
Germany	1,510,000	196,000	15,100	151,000	33,400	3,500	1,661,000	229,400	18,600
Greece	760,000	99,000	7,600	76,000	10,500	800	836,000	109,500	8,400
Hungary	400,000	52,000	4,000	40,000	7,000	300	440,000	59,000	4,300
Ireland	1,940,000	252,000	19,400	194,000	18,100	1,300	2,134,000	270,100	20,700
Italy	1,300,000	169,000	13,000	130,000	14,700	1,100	1,430,000	183,700	14,100
Latvia	250,000	32,000	2,500	25,000	4,700	200	275,000	36,700	2,700
Lithuania	250,000	33,000	2,500	25,000	5,000	200	275,000	38,000	2,700
Luxembourg	2,120,000	276,000	21,200	212,000	87,700	700	2,332,000	363,700	21,900
Malta	910,000	119,000	9,100	91,000	8,800	400	1,001,000	127,800	9,500
Netherlands	1,620,000	211,000	16,200	162,000	25,600	2,800	1,782,000	236,600	19,000
Norway	2,630,000	342,000	26,300	263,000	64,000	2,800	2,893,000	406,000	29,100
Poland	310,000	41,000	3,100	31,000	5,500	200	341,000	46,500	3,300
Portugal	730,000	95,000	7,300	73,000	12,400	100	803,000	107,400	7,400
Slovakia	280,000	36,000	2,800	28,000	6,100	200	308,000	42,100	3,000
Slovenia	690,000	90,000	6,900	69,000	9,000	400	759,000	99,000	7,300
Spain	1,020,000	132,000	10,200	102,000	6,900	300	1,122,000	138,900	10,500
Sweden	1,700,000	220,000	17,000	170,000	53,300	2,700	1,870,000	273,300	19,700
United Kingdom	1,650,000	215,000	16,500	165,000	20,100	2100	1,815,000	235,100	18,600

Developing Harmonised European Approaches for Transport Costing and Project Assessment (for details about the deliverable 5, of interest for the CSIs WG - Proposal for Harmonised Guidelines: <http://heatco.ier.uni-stuttgart.de/>)

Items are valued as if no indirect taxation or subsidy were applied

Fonte: WG "Safety Performance and Monitoring" da Agência Ferroviária Europeia / Projecto HEATCO

Table 1 - Value of Preventing a Casualty (VPC) – 2002 values

Source: European Railway Agency Safety Performance and Monitoring WG/HEATCO project

23. 'Cost of replacing or repairing damaged rolling stock or infrastructure' means the cost of introducing new rolling stock or infrastructure with the same functionalities and technical parameters when it cannot be repaired, or the cost of restoring rolling stock or infrastructure to its condition prior to the accident. Both must be estimated on the basis of the experience of the operator/infrastructure manager. Any costs of leasing rolling stock because the damaged stock is not available must be included.

24. 'Cost of damage caused to the environment' means the cost the operator/IM estimates will have to be met, based on their experience, to restore the area damaged to its condition prior to the accident.

25. 'Cost of delays' means the monetary value of delays incurred by users of rail transport (passengers and freight customers) as a consequence of accidents, calculated by the following model:

VT = Value of travel time savings

The principle underlying VT is that each country's values are used wherever possible, provided an appropriate methodology has been devised.

If these values are not available, the values in **Tables 2 and 3** can be used, which are based on HEATCO project values and assumptions.

The reference year for the values in Tables 2 and 3 is 2002, and these values must be updated on a linear basis in accordance with growth in per capita GDP for the year of calculation.

For passengers not travelling on business, the VT is approximately one third of the values shown in Table 2. Passengers travelling to or from their workplace are not considered to be on business.

• Value of time for a train passenger (per hour)

$$VT_1 = [VT_{(Table\ 2)}] * [\text{annual average percentage of business passenger trips}] + 1/3 * [VT_{(Table\ 2)}] * [\text{annual average percentage of non-business passenger trips}]$$

Country	Business		
	Air	Bus	Car, Train
Austria	39.11	22.79	28.4
Belgium	37.79	22.03	27.44
Cyprus	29.04	16.92	21.08
Czech Republic	19.65	11.45	14.27
Denmark	43.43	25.31	31.54
Estonia	17.66	10.3	12.82
Finland	38.77	22.59	28.15
France	38.14	22.23	27.7
Germany	38.37	22.35	27.86
Greece	26.74	15.59	19.42
Hungary	18.62	10.85	13.52
Ireland	41.14	23.97	29.87
Italy	35.29	20.57	25.63
Latvia	16.15	9.41	11.73
Lithuania	15.95	9.29	11.58
Luxembourg	52.36	30.51	38.02
Malta	25.67	14.96	18.64
Netherlands	38.56	22.47	28
Poland	17.72	10.33	12.87
Portugal	26.63	15.52	19.34
Slovakia	17.02	9.92	12.36
Slovenia	25.88	15.08	18.8
Spain	30.77	17.93	22.34
Sweden	41.72	24.32	30.3
United Kingdom	39.97	23.29	29.02
EU (25Countries)	32.8	19.11	23.82

Table 2 – Value of Time for Business Passenger Trips (VT₁) – 2002 values

- **Value of time for a goods train (one hour):**

$$VT_2 = [VT_{(Table\ 3)}] * \text{tonne.k/tk}$$

Country	Per tonne of freight carried	
	Road	Rail
Austria	3.37	1.38
Belgium	3.29	1.35
Cyprus	2.73	1.12
Czech Republic	2.06	0.84
Denmark	3.63	1.49
Estonia	1.9	0.78
Finland	3.34	1.37
France	3.32	1.36
Germany	3.34	1.37
Greece	2.55	1.05
Hungary	1.99	0.82
Ireland	3.48	1.43
Italy	3.14	1.3
Latvia	1.78	0.73
Lithuania	1.76	0.72
Luxembourg	4.14	1.7
Malta	2.52	1.04
Netherlands	3.35	1.38
Poland	1.92	0.78
Portugal	2.58	1.06
Slovakia	1.86	0.77
Slovenia	2.51	1.03
Spain	2.84	1.17
Sweden	3.53	1.45
United Kingdom	3.42	1.4
EU (25 Countries)	2.98	1.22

Table 3 - Value of time for goods trains (VT₂) - 2002 values

- **Calculation of the cost of a 1 minute delay of a train (C_m)**

a) Passenger trains (C_{mp})

$$C_{mp} = 2.5 * (VT_1 / 60) * \text{pk/tk}$$

b) Goods trains (C_{mf})

$$C_{mf} = 2.15 * (VT_2 / 60)$$

NB: The factors 2.5 and 2.15 between the VT and the value of the delay have been suggested by the HEATCO project.

Calculation of the cost of train delays due to an accident:

$$C_{\text{accident}} = C_{mp} * (\text{Minutes' delay for passenger trains}) + C_{mf} * (\text{Minutes' delay for goods trains})$$

26. 'Number of hours worked by staff and contractors in a year' means the total number of hours, estimated on the basis of the experience of the operator/ infrastructure manager, worked in a year by their own or service providers' staff in order to carry out all the undertaking's activities, not only those relating to safety.

Indicators relating to the technical safety of infrastructure and its implementation

27. **'Automatic Train Protection' (ATP)** means a system determining compliance with signals and speed limits by monitoring speed, including automatic stopping at signals.
29. **'Level crossing (LC)'** means any level intersection between the road and the railway, if authorised by the infrastructure manager and open to public or private road users.
30. **'Active level crossing'** means a level crossing where the crossing users are protected from or warned of the approaching train by the activation of devices when it is unsafe to cross.
31. **'Passive level crossing'** means a level crossing without any form of activating the train approach protection and/or warning system, when it is unsafe to cross.
32. **'Road'** means, for the purposes of data reported under Regulation (EC) No 1192/2003 – Annex H, any private or public road, avenue or motorway, including pedestrian and cycle paths.

Indicators relating to safety management

33. **'Audit'** means a systematic, independent and documented process for obtaining audit evidence and its objective evaluation to determine how well audit criteria are being met. (ISO 9000)

Scale Factors

34. **'Train-km' (tk)** means the unit of measure representing the movement of a train over a distance of one kilometre. The distance used is the distance actually run, if available, otherwise the standard network distance between the origin and destination shall be used. Only the distance on the national territory of the reporting country shall be taken into account (Regulation (EC) No 1192/2003).
35. **'Passenger-km' (pk)** means the unit of measure representing the transport of one passenger by rail over a distance of one kilometre. Only the distance on the national territory of the reporting country shall be taken into account (Regulation (EC) No 1192/2003).

ANNEX D
RELEVANT AMENDMENTS TO LEGISLATION AND
REGULATIONS
2009

National legislation	Legal reference	Date of entry into force	Reason for introduction	Description
Legislation on the national safety authority	-	-	-	-
Legislation on bodies notified, assessors, third parties for registration, investigations, etc.	-	-	-	-
National Railway Safety Rules				
Rules on national safety methods and objectives	-	-	-	-
Rules laying down requirements for safety management systems and safety certification of railway undertakings	-	-	-	-
Rules laying down requirements for safety management systems and safety authorisation of the infrastructure manager	-	-	-	-
Rules laying down requirements for owners of rolling stock	-	-	-	-
Rules laying down requirements for wagon maintenance workshops	-	-	-	-
Rules laying down requirements for authorisation to bring into service and maintain rolling stock or modified stock, including rules for operators to exchange rolling stock, registration systems and requirements for test procedures	-	-	-	-
General traffic rules for the rail network, including rules on signalling and traffic procedures	Addendum 40 to GSR II – Signals	12.07.2009	To improve safety in the event of a risk brought about by external factors	Establishes the protected area signal and respective procedures for train staff
	Addendum 25 ^o to GSR III – Movement of trains	28.05.2009	To improve operating conditions and safety on block lines with simplified operation	Centralised in a command and control room traffic on a number of block lines with simplified operation
	Addendum 35 to GSR V – Train braking	06.10.2009	To improve train operating conditions	Establishes conditions for motion of the last vehicle in the train tail with the parking brake defective.

General traffic rules for the rail network, including rules on signalling and traffic procedures	Addendum 26 to I 2837	02.09.2009	To improve safety at level crossings	Authorises implementation at LCs of 4 half-barriers and video surveillance
	Addendum 27 to I 2837	21.09.2009	To improve safety at level crossings	Authorises implementation of hinged-barriers at LCs and the use of ground-train radio equipment.
	CSI 102/09	12.07.2009	To improve safety in railway operation	Reformulates the procedure for establishing temporary maximum speeds
Rules laying down requirements for internal operating rules (company rules) to be laid down by the infrastructure manager and operators.	-	-	-	-
Rules relating to requirements for staff carrying out safety-related activities, including selection criteria, physical aptitude and vocational training and certification	-	-	-	-
Rules relating to the investigation of accidents and incidents, including recommendations	-	-	-	-
Rules laying down requirements for national safety indicators, including how to collect and analyse such indicators	IET 78	01.04.2009	To standardise the presentation of safety performance information	Establishes the report template for undertakings, to be used to draft their annual safety reports
	IET 79	01.04.2009	To standardise the collection and processing of safety data	Establishes definitions for analysis of common safety indicators in accordance with ERA guidelines
	ICET 179/09	01.04.2009	To standardise the collection and processing of safety data	Establishes a standard table for reporting common safety indicators
Rules laying down requirements for authorising the entry into service of infrastructure (lines, bridges, tunnels, power, ATC, radio, signalling, interlock systems, level crossings, platforms, etc.)	-	-	-	-

ANNEX E
DEVELOPMENT OF SAFETY CERTIFICATION AND
AUTHORISATION

2009

E.1 – Safety Certificates under Directive 2004/49/CE

Table E.1.1		New	Amended/Revised	Renewed
N.º of Safety Certificates – Part A issued in 2009 to:	Undertakings licensed in Portugal	1	-	1
	Undertakings licensed in another Member State	-	-	-

Table E.1.2		New	Amended/Revised	Renewed
N.º of Safety Certificates – Part B issued in 2009 to:	Undertakings licensed in Portugal	1	8	1
	Undertakings licensed in another Member State	1	-	-

Table E.1.3			Accepted*	Rejected*	Pending*
N.º of Safety Certificate applications – Part A submitted in 2009 by:	Undertakings licensed in Portugal	New Certificates	1	-	-
		Certificates amended/revised	-	-	-
		Certificate renewals	1	-	-
	Undertakings licensed in another Member State	New Certificates	-	-	-
		Certificates amended/revised	-	-	-
		Certificate renewals	-	-	-

Table E.1.4			Accepted*	Rejected*	Pending*
N.º of Safety Certificate applications – Part B submitted in 2009 by:	Undertakings licensed in Portugal	New Certificates	1	-	-
		Certificates amended/revised	8	-	-
		Certificate renewals	1	-	-
	Undertakings licensed in another Member State	New Certificates	1	-	-
		Certificates amended/revised	-	-	-
		Certificate renewals	-	-	-

NB (*) – Accepted: application accepted and certificate issued

Rejected: application rejected and certificate not issued

Pending: application being examined, certificate not yet issued

E.2.5 – List of countries in which undertakings that applied for the Safety Certificate – Part B obtained the Safety Certificate – Part A:

- Portugal
- Spain

E.3 – Safety authorisation under Directive 2004/49/EC

Table E.3.1	New	Amended/Revised	Renewed
N.º of Safety Authorisations issued in 2009 to infrastructure management undertakings	-	-	-
	-	-	-

Table E.3.2		Accepted*	Rejected*	Pending*
N.º of Safety Authorisation applications submitted in 2009 by infrastructure management undertakings	New authorisations	-	-	-
	Authorisation amendments/revisions	-	-	-
	Authorisation renewals	-	-	-

NB (*) – Accepted: application accepted and certificate issued
 Rejected: application rejected and certificate not issued
 Pending: application being examined, certificate not yet issued

E.4 – Safety Certificates – Part A: procedures

		New	Amended/Revised	Renewed
Average time in 2009 for issuing a Safety Certificate – Part A, after receipt of all necessary documentation	Undertakings licensed in Portugal	1 month	-	1 month
	Undertakings licensed in another Member State	-	-	-

E.5 – Safety Certificates – Part B: procedures

		New	Amended/Revised	Renewed
Average time in 2009 for issuing a Safety Certificate – Part B, after receipt of all necessary documentation	Undertakings licensed in Portugal	1 month	1 week	1 month
	Undertakings licensed in another Member State	1 month	-	-

E.6 – Safety Authorisation: procedures

	New	Amended/Revised	Renewed
Average time for issuing a Safety Authorisation in 2009, after receipt of all necessary documentation	-	-	-



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