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Ministry of Infrastructure and Transport

DIRECTORATE-GENERAL FOR RAIL TRANSPORT NATIONAL INVESTIGATORY BODY

ANNUAL REPORT ON WORK CARRIED OUT IN 2009

(Directive 2004/49/EC, Article 23(3))

(Legislative Decree No 162 of 10 August 2007, Article 22(3))

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1-FOREWORD

1.1. Annual Report of the Directorate-General for Rail Transport National Investigatory Body

The Annual Report has been drawn up, as stipulated in Article 23(3) of Directive 2004/49/EC and Article 22(3) of Legislative Decree No 162 of 10th August 2007, with the following title: ‘*Implementing Directives 2004/49/EC and 2004/51/EC on the safety and development of the Community’s railways*’.

The report, which is to be published each year before or on 30th September, corresponds to the work carried out in the previous year by the *Directorate-General for Rail Transport National Investigatory Body* (which is now the *Permanent Investigating Body* in Italy, stipulated in Article 21 of Directive 2004/49/EC of 29th April 2004) and, in particular, any investigations carried out in the previous year into accidents and incidents on the railways, and recommendations relating to safety and measures taken by those to whom the recommendations were made.

The report, which has been drawn up in line with the general guidelines issued by the *European Railway Agency (ERA)*, is sent to the ERA and published on the government website.

In 2009, the tasks of the *Permanent Investigating Body* were carried out as follows:

- up until 1st April 2009 by the ministerial body (*Directorate-General for Rail Transport*), which already existed when Directive 2004/49/EC came into force and was the competent body for investigating railway accidents;
- for the rest of year 2009, they were carried out by the *Directorate-General for Rail Transport*, whose powers were nevertheless amended to take into account the transposition into national law of Directive 49/2004 by Legislative Decree 162/2007; the investigating body took effect with Ministerial Decree No 62T of 4th March 2008.

This body – the *Directorate-General for Rail Transport National Investigatory Body* – which is the permanent investigating body for Italy, stipulated in Article 21 of Directive 2004/49/EC, was set up by Presidential Decree No 211 of 3rd December 2008 (*Regulation on the reorganisation of the Ministry of Infrastructure and Transport*), which came into force on 20th January 2009 and was supplemented by Ministerial Decree No 307 of 2nd April 2009.

The present report:

- has been drawn up on the basis of the file documents regarding:
 - analyses of the railway accidents specified in the information reports put forward by the Infrastructure Manager and the involved Railway Agencies;
 - investigations that have been opened either by the *Permanent Investigating Body* or by other bodies;
 - examination of the final investigation reports completed by the end of 2009 (including those started in previous years);
 - recommendations made;
 - the extent to which suggestions forming part of the recommendations have been implemented in order to improve the management of safety in rail traffic and operation of the railways;
- includes regulatory references, definitions and organisational aspects, which in some cases move away from the objectives specified in the report (as provided for in the legislation) and which are intended to provide – to the layperson as well as to specialists – an overall framework for the complex, wide-ranging and important area of rail network safety, in

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which the consistent application of procedures and regulations, technical complexity and the various interactions of the authorities are of great significance.

As outlined in the following paragraph, this present report does not relate to local railways and is not connected to the national rail system, or the trams or the underground.

2 - ENSURING SAFETY IN THE ITALIAN RAIL SYSTEM

2.1 The national rail system

The work described in this report is that carried out by the *Permanent Investigating Body* during 2009 and relates to the national rail system, as defined in Legislative Decree No 162 of 10th August 2007, which comprises of:

- the national railway infrastructure: 16,529 km of track, operated by *Rete Ferroviaria Italiana SpA* (RFI) under the terms of the concession granted (Ministerial Decree of the Ministry of Transport No 138-T of 31st October 2000);
- the rail transport services operating on the national network, part of the (as of 31st December 2009) 33 railway companies which hold the appropriate authorisations (railway licences; safety certificates; authorising contracts; etc).

In 2009, railway traffic on the RFI network amounted to the following:

- Km Passenger Trains = 273.558.534;
- Km Goods Trains = 44.700.736;
- Km Other = 4.995.393;
- Km Total Trains = 323.254.663;
- Km Passengers = 44.589.319.674.339.2 million train kilometres, of which 275.8 million comprised passenger traffic and 63.4 million goods traffic.

2.2 – The regulatory framework

2.2.1 The development of rail transport: European Union regulations and policies

The first measures taken under EU policy were put into effect in the 1990s and were aimed at the effective opening-up of the rail transport system, guarantees of safety, and more goods transported by rail. Following on from the analyses carried out, they took the form of Directives 440/91 on the development of the Community's railways; 18/1995 on the licensing of railway undertakings; 19/1995 on the allocation of railway infrastructure capacity and the charging of infrastructure fees; and 48/1996 on the interoperability of the trans-European high-speed rail system.

In 2001, the EU went on to establish a second phase for reforming the sector (the first railway package or so-called 'infrastructure package'): the Directives 12/2001, 13/2001 and 14/2001, which amended Directives 440/1991, 18/1995 and 19/1995 respectively, established principles and guidelines on the allocation of railway infrastructure capacity and the charging of

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infrastructure fees; Directive 16/2001 covered the interoperability of the trans-European conventional rail system.

The last of these, Directive 2001/16/EC (transposed into Italian law by Legislative Decree No 268 of 30th September 2004), relates to the interoperability of what was called the ‘conventional’ rail system, as distinct from the high-speed system (Directive 1996/48/EC, transposed into Italian law by Legislative Decree No 299 of 24th May 2001).

A subsequent phase in the process of opening-up the European rail system came with the introduction on 29th April 2004 of the ‘second infrastructure package’, which amongst others provides for:

1. The extension of the opening-up of the national rail goods transport sector and the application of interoperability to the entire national rail network, excluding individual lines or groups of lines not connected to the national rail network;
2. The establishment, throughout the country, of a *Safety Authority* (which is entrusted with the media/promotional issues relating to safety, including those previously carried out by the infrastructure operator) and of a *National Investigation Body*, the *Permanent Investigating Body* for railway accidents. Under this legislation infrastructure operators that possess both management and promotional powers in relation to safety will become operators that possess only management powers [Directive 2004/49/EC on safety on the railways];
3. An updating of the directive on interoperability, geared towards increasing harmonisation of technical and safety requirements [Directive 2004/50/EC which amended Directive 1996/48/EC and Directive 2001/16/EC];
4. The establishment of the European Railway Agency, a community body for safety and interoperability, which is responsible for ‘steering’ of the coordination and development of safety and interoperability of the various national rail systems [Regulation 881/2004/EC].

The ‘*third railway package*’ of 2006 established additional regulations, not only in relation to a few topics specifically regarding the opening-up of the market, but also to the Europe-wide certification of train drivers.

2.2.2 – The development of rail transport in Italy

On a national level, the Italian rail transport has developed as follows:

- through the issue of Presidential Decree No 277 of 8th July 1998, which acknowledges Directive 1991/440/EEC;
- through the issue of Presidential Decree No 146 of 16th March 1999, which acknowledges Directives 1995/18/EC and 1995/19/EC;
- through the issue of Legislative Decree No 188 of 8th July 2003, which brought into force the principles and guidelines put in place by Community legislation in Directives 2001/12/EC, 2001/13/EC and 2001/14/EC;
- through the issue of Legislative Decree No 162 of 10th August 2007, which acknowledges Directive 2004/49/EC.

Now that the three ‘*railway packages*’ have been put into effect, the allocation of roles to the various industrial and public operators in the national rail system has been finalised.

2.3 – The different competences of the different rail safety bodies

2.3.1. The European Railway Agency - ERA

Regulation (EC) No 881/2004 of the European Parliament and of the Council establishes the European Railway Agency, which is based in Lille-Valenciennes in France, with:

- the general objective of ‘steering’ both the process of European harmonisation of the regulations regarding rail transport safety and the process of developing regulations and;
- working with experts seconded to it by the Member States and by operating companies in the sector, the main task is to define:
 - the Technical Specifications for Interoperability (TSIs) referred to in the directives on interoperability;
 - the Common Safety Targets (CSTs);
 - the Common Safety Methods (CSMs),

introduced into the directive on safety, in order to guarantee and continually improve safety levels on rail transport throughout the European Union.

It remains the task of the European Commission and the Committee referred to in Article 21 of Directive 1996/48 on the interoperability of the high-speed rail system to:

- decide to adopt the TSIs, CSTs and CSMs proposed by the Agency and the Common Safety Indicators (CSIs) identified on the basis of Annex I of the directive on safety;
- to exercise the authority to regulate safety and interoperability at a community level.

The Agency is also tasked with obtaining the enforced or newly issued national legislation on safety from the Member States, of checking that it is compatible with the Treaty on European Union, the relevant European Directives, the TSIs, the CSTs and the CSMs.

Finally, it is the task of the Agency to supervise the work of the bodies referred to in the directives on interoperability, to support and develop technological and scientific research in the sector and to carry out specific investigations of individual national authorities in the Member States, in order to collect information and documents on the procedures for transposing and bringing into effect Community legislation in the sector.

2.3.2 An outline of the development of the supervisory functions and the related regulatory framework in Italy

The national rail system, run by the *Azienda Autonoma Ferrovie dello Stato* [Autonomous State Railway Agency] and subsequently – under Law 210/85 – by the *Ente Ferrovie dello Stato* [State Railways Body], has undergone a series of changes over the last few years, which have fundamentally altered the way the sector is organised.

Based on the provisions in Legislative Decree No 333 of 11th July 1992 and its enacting law (Law No 359 of 8th August 1992), the decision of CIPE [Joint Ministerial Committee for Economic Planning] on 12th August 1992 completed the conversion of the *Ente Ferrovie dello Stato* into a limited liability company.

The first board of directors and the first managing director of *Ferrovie dello Stato SpA* were appointed on 22nd and 23rd December 1992 respectively, and about a year later on 26th November 1993, Ministerial Decree No 225 T was issued, representing the first concession for the new company.

Law No 537 of 24th December 1993 charged the Ministry of Transport and Shipping with ‘*the tasks of supervising Ferrovie dello Stato SpA, to be carried out by an appropriate monitoring*

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unit': said regulation was fully implemented by Presidential Decree No 202 of 24th April 1998, setting out new organisational rules for the government.

With the aforementioned Presidential Decree, which put into effect the Law 537/93, a specific 'Railway Supervisory Service' was set up, and its organisation and tasks were regulated by the Ministerial Decree No 148 T of 28th December 1998.

The aforementioned Service, required to carry out its tasks in line with the law, the Concession of Ministerial Decree No 225 T/1993 and the Programme and Service Contracts established with FS SpA, began operations in May 1999.

In 2001, the *Railway Supervisory Service* underwent both a formal change (changing its name to 'Directorate-General for Rail Transport') and a substantive change (not only supervising *Ferrovie dello Stato SpA*, but also becoming the authority responsible for the entire national railway sector), following the merger of the Ministry of Transport and Shipping with the Ministry of Public Works, which in turn were replaced by the Ministry of Infrastructure and Transport.

2.3.3. Changes to FS SpA following the first infrastructure package

The subdivision of the roles and the separation of the agencies responsible for infrastructure management and the delivery of transport services, as well as the separation of their budgets, resulted in two distinct bodies, with the legal formation of a limited liability company; hence independent legal and organisational structures.

The process of re-structuring FS SpA began in July 1998 (immediately after the enactment of Presidential Decree 277/1998) with the creation of the Infrastructure Division, followed in the May of the successive year by the introduction of the three Transport Divisions: Passenger, Regional, and Goods Transport. In June 2000, the company Trenitalia was founded, reuniting the three transport divisions in one company. The process was completed on 1st July 2001 with the establishment of two new companies: a) RFI SpA – the Concessionary of the State and operator of the national rail infrastructure; b) Trenitalia SpA – the operating rail company.

2.3.4 The current framework of competences regarding supervision of safety on the railways

As highlighted several times, Directive 2004/49/EC provided for the establishment, in every Member State of the EU, a national authority for rail safety, which is entrusted with the tasks of regulation and monitoring of safety on the railways: Italy acknowledged this directive with the above mentioned Legislative Decree No 162 of 10th August 2007, which established the *National Railway Safety Agency (ANSF)* and the *Directorate-General for Rail Transport National Investigatory Body (DGIF)*.

Together with the cited Legislative Decree 162/2007, the other primary authority for the current set-up of the bodies responsible for safety on the railways is Presidential Decree No 211 of 3rd December 2008 (*Regulation on the reorganisation of the Ministry of Infrastructure and Transport*).

The current framework of competences regarding the provision of safety on the railways can be described briefly as follows:

- The *Railway Undertakings* – holders of the *Rail Licence* and *Safety Certificate* – operate on the national rail network (which is managed by *RFI SpA*), both within the scope of the system of regulations defined by the *National Railway Safety Agency (ANSF)* and on the basis of *instructions and rules* issued by the *National Railways Infrastructure Operator* (which is *RFI*)

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and in compliance with a *Safety Management System* run within each railway undertaking and validated by the issuing of the *Safety Certificate*;

- The *Railway Undertakings* are subject to supervision and monitoring by ANSF – who issues the *Safety Certificate* – and also by the *Infrastructure Operator*;
- For its part, the *Infrastructure Operator* operates both within the scope of regulations drawn up and issued by ANSF and on the basis of the instructions and rules issued within the organisation itself.

The National Railway Safety Agency

The National Railway Safety Agency (ANSF) is a not-for-profit public body that comes under and is monitored by the Ministry of Infrastructure and Transport, which is run through particular offices of the *Directorate-General for Rail Transport*.

ANSF is tasked with ensuring safety on the national railways and executes the tasks stipulated in Directive 2004/49/EC and Article 6 of Legislative Decree 162/2007. In summary, it currently covers the following:

1. issuing technical sector railway regulations (standards and safety regulations for rail transport);
2. type-testing rolling stock and its components for those aspects relating to transport safety, and releasing rolling stock for service;
3. issuing and renewing safety certificates for the Railway Undertakings;
4. inspecting, auditing and monitoring the work of the Railway Undertakings;
5. conducting investigations into railway accidents to identify the causes of the incidents as soon as possible, so that any immediate regulatory or technical action necessary can be taken to prevent such accidents from happening again.

The Directorate-General for Rail Transport

Under Article 5 of Presidential Decree No 211 of 3rd December 2008, the *Directorate-General for Rail Transport* has the following functions:

- it sets policy and supervises ANSF;
- it takes responsibility for interoperability on the railways and the associated regulations for the systems and subsystems of rail transport (running, power, maintenance, control centres and signalling, rolling stock, telecommunications equipment etc);
- it takes responsibility for the bodies that issue certificates;
- it represents the government within the ‘*Railway Interoperability and Safety Committee*’ (RISC) at the European Commission, for aspects under its authorisation, by agreement with the *Directorate-General for Rail Transport and Railway Interoperability*;
- it takes charge of the regulations for the rail transport of hazardous goods under the RID international standard.

Directorate-General for Rail Transport National Investigatory Body

As already established, the Directive 2004/49/EC provides the establishment of an Investigation Body to conduct investigations into any serious incidents or accidents on the railways, so as to improve rail safety and prevent future accidents.

Legislative Decree No 162 of 10th August 2007 established, within the Ministry of

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Infrastructure and Transport, the *Directorate-General for Rail Transport National Investigatory Body* (DGIF); this provision was brought into effect by Presidential Decree No 211 of 3rd December 2008 (*Regulation on the reorganisation of the Ministry of Infrastructure and Transport*) and was finalised by Ministerial Decree No 307 of 2nd April 2009.

The *general objective* of the work carried out by the *Directorate-General for Rail Transport National Investigatory Body* is to improve safety on the railways, by pursuing *operating objectives* resulting from the *identification of the causes of accidents or incidents in operation* and the definition of possible *Safety Recommendations*; the *Directorate-General* does not involve itself in the processes of monitoring the various bodies that ensure safety on the rail system.

In order to pursue these objectives, the main work of the Investigatory Body is to conduct investigations (carried out by its own staff or through the use of external investigators) into railway accidents or incidents, with the aim of identifying their cause and supplying any recommendations made to improve rail safety and prevent accidents to the parties concerned (ANSF, Infrastructure Operator).

At present, the list provided for in Article 18(4) of Legislative Decree 162/2007 (which was furthermore drawn up in 2008 and is continually updated) is used to appoint investigation officers.

The *Final Investigation Reports* are to be completed within the short timeframes allotted for the completion of work, and which Community and national regulations forecast as a means of ensuring transparency; to ensure that all parties involved are informed about the progress of the investigations, be it to express their views and have access to the results, or to present their views about the investigation and to have the power to comment on the information planned for inclusion in the report.

Based on the reasons identified, the Directorate-General draws up any further recommendations (aside from those that will appear in the *Final Investigation Report*) and sends them, together with the *Report* itself, to the parties concerned (ANSF, the Infrastructure operator) and ERA (*European Railway Agency*).

It is important to outline, that the investigations in no way aim to establish responsibility for civil or criminal damage, for which the judiciary is the sole competent authority.

Furthermore, it is important to remember that Article 20 of the aforementioned Directive 2004/49/EC recites word-for-word the following important principles: “1. The Member States shall establish, within the framework of their own legal systems, the legal status of the investigation so as to enable the investigators to do their job as efficiently and as quickly as possible; 2. In accordance with the legislation of the Member States and, where appropriate, in co-operation with the authorities responsible for the judicial inquiry, investigators have access to the accident site etc.”

Therefore, the investigators’ operations should remain subordinate to that of the Criminal Investigation Department, defined by the Code of Criminal Procedure effective in Italy.

In addition to serious accidents, the Directorate-General may investigate accidents and incidents, which under slightly different circumstances, could have led to serious accidents.

Following a serious railway accident, at least four different levels of action are triggered:

1. emergency services and first aid;
2. any concrete, technical and/or prescriptive action to prevent conditions which could lead to further damage from arising or continuing and to re-start railway traffic;
3. judicial investigations;
4. identification of the technical causes of the accident.
5. recommendation of railway safety.

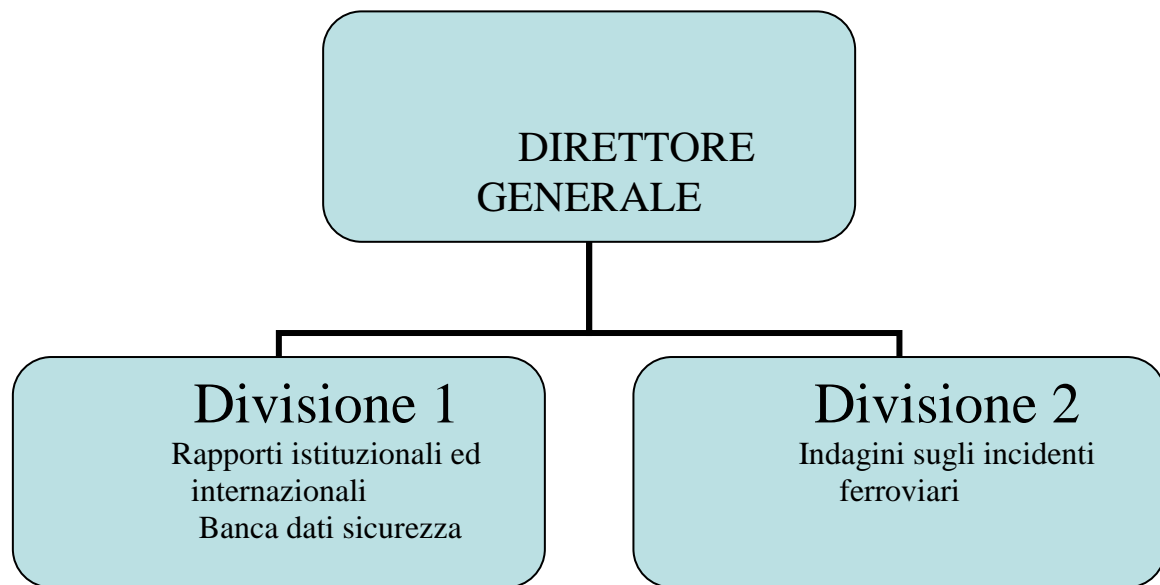
Generally speaking, different institutional bodies can carry out their own investigations with differing objectives and these are listed below:

- the *judiciary*: aims to determine responsibility;

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- *ANSF*: aims to promptly establish any useful information for identifying the causes, so that any regulatory and technical measures helping to prevent the accidents from happening again can be adopted immediately;
- the *Directorate-General for Rail Transport National Investigatory Body*: aims to find the causes of the accident, so as to provide recommendations for the improvement of rail safety to be included in the Final Investigation Report;
- the *Infrastructure Operator* (RFI SpA) and the *Railway Undertakings*: to allow the prompt identification of causes of the accident, so as to individualise the elements required for the adoption of corrective action and improved measures.

The current organisation of the *Directorate-General for Rail Transport National Investigatory Body* (taken from the provisions of Presidential Decree No 211 of 3rd December 2008 and Ministerial Decree No 307 of 2nd April 2009) is shown below.



Areas of Competence:

- Liaison with the European Railway Agency accidents
- Liaison with ANSF
- Liaison with the network operating companies and the Railway Undertakings
- Liaison with other investigation bodies in the EU
- Liaison and agreements with external bodies (railway police, civil protection agencies, etc.)
- Drawing up, management and updating of safety who database
- Annual report

Areas of Competence:

- Establishment of committees to investigate railway
- Co-ordination of investigations
- Development of investigative procedures
- Investigations into operating incidents
- Drawing up of safety recommendations under Article 24 of LD 162/ 2007
- Training of investigation officers
- Drawing up, management and updating of list of experts
may be appointed as investigation officers

Directorate-General for Local Public Transport

Within the regional railways sector (outside the network operated by RFI), especially those not connected to the national network, the body responsible for safety regulations, monitoring and

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investigations into accidents is still the *Directorate-General for Local Public Transport*, referred to in Article 6 of Presidential Decree No 211 of 3rd December 2008.

Directorate-General for Local Public Transport

Within the regional railways sector (outside the network operated by RFI), especially those not connected to the national network, the body responsible for safety regulations, examinations, tests, checks and monitoring, as well as investigations into accidents, is at present the Directorate-General for Local Public Transport, referred to in Article 6 of Presidential Decree No 211 of 3rd December 2008.

For example, the proceedings following the serious accident that took place on the narrow gauge line Circumvesuviana in Naples, 6th August 2010, fall under the responsibility of this Directorate-General.

Special Statute Regions and Autonomous Provinces

Still within the area of the regional railways sector (not connected to the national network controlled by the RFI, but situated in the Special Statute Regions and Autonomous Provinces), the body responsible for the safety regulations and regular exercise of safety regulations, the relevant controls, tests, checks and monitoring, as well as investigations into accidents, is at present the relevant local offices under the various regulations.

For example, the proceedings following the serious accident that took place on the Merano line, Malles, on 12th April 2010, falls under the responsibility of the autonomous Province of Bolzano.

3 – RAILWAY ACCIDENTS IN 2009 IN COMPARISON TO PREVIOUS YEARS

3.1 – Definitions

Legislative Decree 162/2007 defines the following as:

- ***rail system***: all the structural and functional subsystems as defined in Directives 1996/48/EC and 2001/16/EC and modifications there to, as well as the overall management and operation of the system itself;
- ***technical specifications for interoperability (TSIs)***: the specifications by which each subsystem or part subsystem is covered in order to meet the essential requirements and ensure the interoperability of the trans-European conventional and high-speed rail systems, as defined in Directives 1996/48/EC and 2001/16/EC and amendments there to;
- ***common safety targets (CSTs)***: the minimum levels of safety that must be reached or exceeded by the various parts of the rail system (namely the conventional rail system, the high-speed rail system, long railway tunnels or lines used solely for goods transport) and the overall system, seen as risk acceptance criteria;
- ***common safety methods (CSMs)***: the methods to be drawn up so as to describe, as well as assess, safety levels, the meeting of safety targets and the fulfilment of other safety requirements;
- ***national safety regulations***: national regulations and standards that are necessarily included in requirements for rail safety and are applicable to one or more infrastructure operators and one or

more railway companies;

- **safety management system:** the organisation and measurements taken by an infrastructure operator or railway company to ensure the safe management of operations;
- **investigation officer:** a person, either from an investigating body or appointed by that body, in charge of organising, conducting and monitoring an investigation;
- **accident:** a sudden, unfortunate and unintentional event or specific chain of events which result in damage; accidents are divided into the following categories: collisions, derailments, accidents at level crossings, injury to persons caused by moving rolling stock, fires, and other;
- **serious accident:** any railway collision or derailment that results in at least one fatality or serious injury to five or more persons, or serious damage to rolling stock, infrastructure or the environment, and any other similar accident which has a clear impact on the regulation of railway safety or its management; serious damages: damage for which the total cost can immediately be appraised by the investigating body at less than €2 million;
- **incident:** any event other than an accident or a serious accident that is associated with train traffic and has an influence or potential influence on the safety of operations;
- **investigation:** a procedure for the purpose of preventing accidents and incidents, including the collecting and analysis of information, the drawing up of conclusions, as well as determining causes, and, where appropriate, the drawing up of safety recommendations;
- **causes:** any action, failure to act, event or circumstance, or combination thereof, resulting in an accident or an incident;

It may also be useful to note some definitions (accidents, typical accidents, atypical accidents) used by the UIC (*International Union of Railways*) for the compiling of its statistics.

Accident: accidents that have the following consequences:

1. fatalities (any person killed immediately or dying within 30 days as a result of the accident) or serious injuries (any person who was hospitalised for more than 24 hours), excluding suicides or attempted suicides, and deaths due to crime or to natural causes;
2. significant damage to rolling stock, infrastructure or installations (damage greater than €150,000) or serious disruption to train traffic (main line blocked for more than six hours, diversion or transfer of passengers from one train to another).

Typical accidents

- collisions between rolling stock, or rolling stock and an obstacle, excluding accidents at level crossings;
- derailments (of trains or individual locomotives during shunting or otherwise);
- level crossing accidents, involving collisions between rolling stock and road vehicles;
- fires on rolling stock during use.

Atypical accidents

‘Atypical’ accidents are defined as accidents caused by rolling stock and involve persons who:

- are taking part in the shunting or the coupling of vehicles;
- are standing or walking beside the railway;
- are hit by an obstacle or vehicle while being transported by a railway vehicle;
- fall from a moving railway vehicle;
- are run over at a level crossing.

3.2 – Accidents in the period 2005-2009

The tables and diagrams below show the official data for accidents on the national railway infrastructure, operated by RFI in the period 2005-2009; the tables broadly take the same form as that used in the Annual Report from last year (number of accidents in 2008).

ACCIDENTS	2005		2006		2007		2008		2009	
	o	er/bill. tr*km	o	er/bill. tr*km	o	er/bill. tr*km	o	er/bill. tr*km	o	er/bill. tr*km
Train Collisions		4,77		1,56		1,67		,89		,28
Trains colliding with obstacles		,86		,67		1,67		,89		,28
Collisions between trains		,90		,89				,00		,00
Train Derailments		7,72	1	1,80		3,34		3,58		5,47
Accidents at Level Crossings	5	3,85	2	2,51	9	5,44		6,53		5,47
Accidents involving persons and caused by rolling stock	0	65,87	6	19,72	3	42,19	9	32,90	4	28,92
Fires on Rollings Goods		1,81		1,56		1,67		,89		,00
Other		1,81		4,45		,75		,84		1,65
TOTAL	34	95,85	32	81,62	21	53,07	03	03,65	4	90,79

Table 1 – Accidents in the period 2005-2009

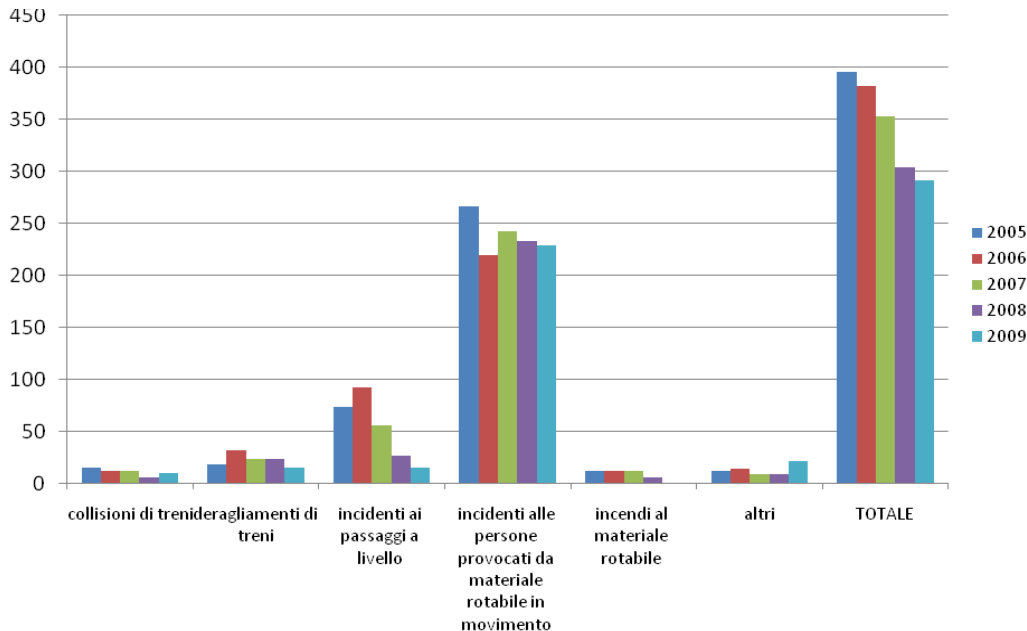


Figure 1 – Graph of accidents in the period of 2005-2009
(in billion/train kilometres)

The following table (Table 2) shows a summary of official data on fatalities and injuries for individual years.

	2006									2007														
	Passengers			Personnel			Others			Total			Passengers			Personnel			Others			Total		
	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other
Collisions between trains	0	0	0	2	0	2	0	0	0	2	0	2	0	0	0	0	1	1	1	0	1	1	1	2
Train derailments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accidents at level crossings	0	0	0	0	0	0	18	13	31	18	13	31	0	0	0	0	0	0	15	3	18	15	3	18
Accidents caused by rolling stock in motion to persons	5	14	19	6	2	8	38	15	53	49	31	80	5	9	14	2	3	5	43	21	64	50	33	83
Fires on rolling stock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	2	2	4	0	0	0	2	2	4	0	0	0	0	1	1	0	0	0	0	0	1
TOTAL	5	14	19	10	4	14	56	28	84	71	46	117	5	9	14	2	5	7	59	24	83	66	38	104
	2008									2009														
	Passengers			Personnel			Others			Total			Passengers			Personnel			Others			Total		
	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other	Deaths	Serious Injury	Other
Collisions between trains	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1
Train derailments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	13	43	30	13	43
Accidents at level crossings	0	0	0	0	0	0	3	5	8	3	5	8	0	0	0	0	0	0	5	0	5	5	0	5
Accidents caused by rolling stock in motion to persons	4	5	9	5	4	9	47	18	65	56	27	83	5	10	15	4	3	7	36	16	52	45	29	74
Fires on rolling stock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	4	4
TOTAL	4	5	9	5	4	9	51	23	74	60	32	92	5	10	15	5	7	12	71	29	100	81	46	127

Broadly speaking, the figures above speak for themselves.

FOR CONSIDERATION: As long as there is even one fatality for any type of accident, the situation can not be described as acceptable.

The disaster at Viareggio (29th June 2009) was a sad and distressing incident, which can and should not be downplayed, swept under the carpet, or even worse, forgotten.

The number of deaths from 2009 includes the serious incident at Viareggio (this incident is referred to later on).

The table below shows the cases referring to a specific type, the *signal passed at danger* (SPAD), by trains in the period from 2000-2009.

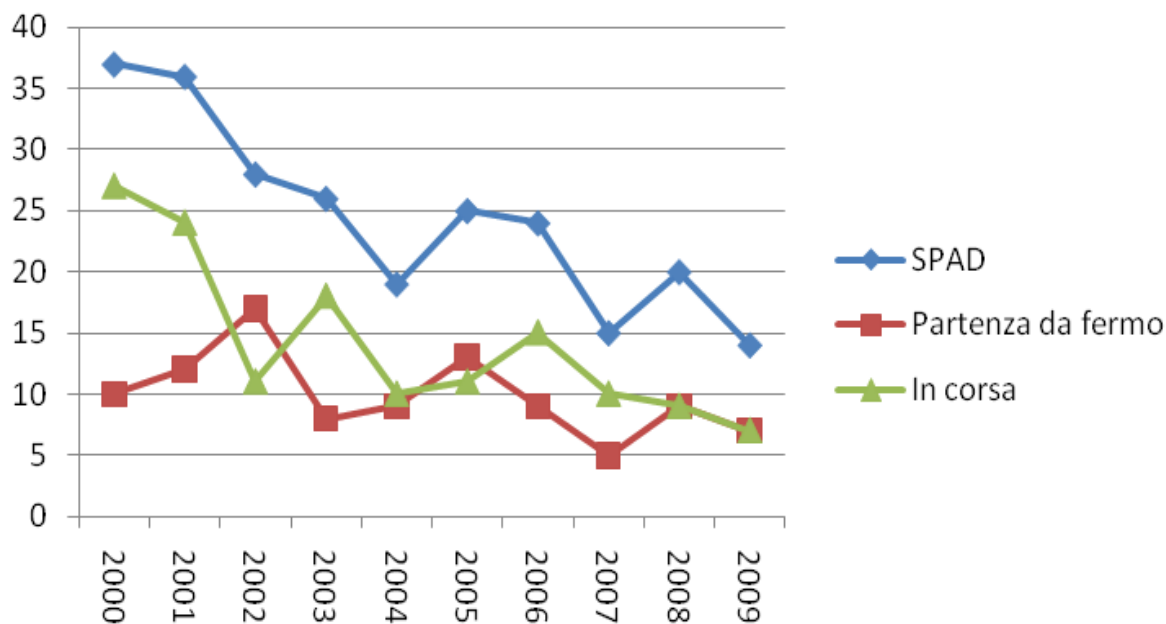


Figure 2 – Analysis of SPADS in the period from 2000-2009

YEAR	SPAD	From stationary	Moving	Other
2000	37	10	27	-
2001	36	12	24	-
2002	28	17	11	-
2003	26	8	18	-
2004	19	9	10	-
2005	25	13	11	-
2006	24	9	15	-
2007	15	5	10	-
2008	20	9	9	2
2009	14	7	7	-

Table 3 – SPAD from 2000-2009

In 2009, no serious accidents caused by SPADs were recorded; in the last year, as shown in table 3, the number of SPADs has decreased. Even though the trend is certainly positive during the period concerned, the figures, nevertheless, show that there is a need for particular focus on this phenomenon. Furthermore, this Directorate decided in 2010 to appoint an Investigation Board to examine the phenomenon of SPADs.

3.3 – Accidents investigated by the Directorate-General for Rail Transport National Investigatory Body

As outlined above, in accordance with Article 19 of Legislative Decree 162/07, this Directorate oversees investigations, so as to provide any recommendations for the improvement of railway safety and the prevention of:

- further serious accidents;
- accidents and incidents, which under slightly different circumstances, could have led to serious accidents; including technical failure of the structural subsystems or interoperability components of the trans-European high-speed or conventional rail systems.

In cases where there is no obligation to open an investigation, the office must take into account the following points when deciding whether to investigate an accident or incident:

- a) the seriousness of the accident or incident;
- b) whether it is part of a series of accidents or incidents relevant to the system as a whole;
- c) the impact of the event on rail safety at a European level;
- d) requests from the infrastructure operator, the railway companies, the authorities responsible for safety or the Member States.

The *Directorate-General* determines the scope of the investigations and related procedures, taking into account also what is to be learned from the accident or incident in order to improve safety; the inquiry is not in any way intended to establish blame or responsibility.

The criteria used to draw up tables, like those above, are more appropriate for a statistical survey, so as to make comparisons to the criteria of Directive 2004/49/EC; whereas the data and information this Office needs to carry out its work efficiently may differ in numerical terms from the overall data on accidents: some of the accidents and incidents investigated by the *Directorate* are not included in the data tables like the one above.

It is clear from information published by the Investigatory Body in 2008 that the accidents that have to be reported immediately (regardless of the consequences of the accident) are those shown in the table below; this table has been useful in establishing the conditions for whether to launch an investigation or not; this table also shows the data on file that was used to establish the basis of work for the Office.

The events that prompt a consideration of proposals for measures to improve traffic safety are those which, because of the seriousness of the event (applicable to those dangerous ones) or the excessive frequency of occurrence, call for an investigation to identify their causes and criticality: hence, the Investigatory Body has defined specific criteria for selecting the type of events that are to be reported (regardless of the consequences of the accident) by the Infrastructure Operator and the Railway Undertakings.

The said criteria, established at the end of 2008, still form the framework for data gathering that is applied by this body; studying the information allows the incident, and its seriousness, to be assessed quickly and concisely, and in most cases allows a decision to be taken on whether an investigation should be launched, without going into greater detail at that stage.

No	Type of Accident	Number of Accidents		
		1 st Jan - 30 th Sept	1 st Oct - 31 st Dec	Total in 2009
1	Collisions with trains with one another or with other obstacles	30	17	47
2	Train Derailments	14	4	18
3	Interruptions to Traffic for at least 6 hours	10	3	13
4	Fatalities and/or personal injuries	58 + 26	41+13	99 +39
5	Damages equal to at least €150.000	...	1	1
6	Collisions between work trains	2	2	4
7	Fires on rolling stock	5	2	7
8	Uncoupling of Passenger Trains	2	1	3
9	Signal Passed At Danger (SPAD)	13	9	22
10	Runaway Vehicles	1	1	1
11	Level crossings improperly opened	4	1	5
12	Events involving trains transporting hazardous goods	6	9	15
13	Serious events occurring in sidings or depots

Table 4 – Rail Accidents reported by RFI and Trenitalia in 2009

With the use of the above-mentioned criteria, data collection has certainly been more precise and regulated, as is described in more detail in Section 6 below.

4 – WORK CARRIED OUT IN 2009

As outlined above, the Investigatory Body became fully operational in the second half of March 2009.

The tables below show :

- Investigations launched and concluded in 2009
- Investigations launched in previous years and concluded in 2009
- Investigations launched in 2009 but not concluded within the year

4.1 – Investigations launched and concluded in 2009

Date of accident	Place	Type of accident/incident
24/01/09	Anagni	Break-up of a ETR 500 train

4.2 - Investigations launched in previous years and concluded in 2009

Date of accident	Place	Type of accident/incident	Date of finalisation
19/10/04	Palermo-Palazzo	SPAD and pile-up on buffers	19.02.2009

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	Reale d'Orleans		
From 08.06.2008 to 14.07.2008	Various	9 derailments noted in a period of 36 days	04.03 2009
08.08.2008	Potenza Station	Derailment of a locomotive on an industrial branch line	16.02.2009

4.3 - Investigations launched in 2009 but not concluded within the year

Date of accident	Place	Type of accident/incident
From 01.01.2009 to 04.05.2009	Various	Injuries to passengers either ascending or descending from a moving train
From 01.01.2009 to 04.05.2009	Various	Fire on board
22.06.2009	Prato-Vaiano	Derailment of goods train transporting hazardous goods
29.06.2009	Viareggio	Derailment of goods train transporting hazardous goods
20.09.2009	Milan Station	Empty passenger train derailed during transfer operation
20.09.2009	Various	Derailments from 01.01.2009 al 31.12.2009: study into the phenomenon
30.10.2009	Various	Collision of the train with persons either at the station or on the line (type of accident 04): study into the phenomenon
21.12.2009	Verzuolo (Savigliano-Cuneo line)	Runaway rolling stock

4.4 – Reports into the investigations concluded in 2009

Each of the final investigation reports (submitted by the relevant committees in 2009) are outlined in detail below; each report refers to the accident, the findings made by the Board in relation to the accident's causes, the considerations and the recommendations put forward by both the Investigation Board and this Investigatory Body.

In the following Section 5, the recommendations made in light of the report and the received feedback are shown in more detail.

4.4.1 – Investigations launched and concluded in 2009

24th January 2009 - Anagni

On 24th January 2009 at 20:33, Eurostar train No ES 9456, from Naples (Central Station) bound for Rome (Termini Station) was stopped in the Operating Area in Anagni for check-ups on some irregularities in the main pipe (low pressure). As the train departed once again, after a few attempts to repair it, the tensioner between the sixth and seventh carriage broke and split the train in two.

After having split in two and following an emergency braking, due to the break in the general pipe, the two sections came to a stop a few metres from each other without inflicting damage to people or infrastructure.

The incident caused an interruption to the AV/AC Naples-Rome service, up until the removal of the two sections of the train, which were sheltered overnight at the Dynamic Multifunctional Facility (IDP) in Naples. The 170 passengers were transferred, so that they could continue their journey to Rome.

The Board did not consider the splitting of the train to be caused by mistakes or negligence on the part of the train crew, which operated within the capabilities of the equipment; without effectively 'breaking' the system process, they were able to carry out operations that the braking system itself would not have permitted.

The Board instead came to the conclusion that the tensioner had been subject to previous stresses, alike to that which caused the accident, and that similar issues (the current pressure phenomena) could also be found in the tensioners currently used in the ETR 500 fleet of trains.

In examining the intricacies of the convoy split, the Board noted (in addition to criticism of the part that suffered the break) some critical issues relating to the braking system itself; more specifically to the traction of the two locomotives, which would have significantly raised the stress levels on the coupling, especially if the emergency brake were actioned from the rear of the train.

A lack of a general pressure recording was also another factor to have emerged from the analysis of on-board data.

Finally, the Board noted a lack of written procedures, written testimonies, statements by station staff, or records of "photographing" the state of the train immediately after the event, the lack of which makes understanding the possible causes of the accident more difficult.

4.4.2 – Investigations launched in previous years and concluded in 2009

19th October 2004 – Palermo-Palazzo Reale d'Orleans

On the 19th October 2004 at 12.20, train No 22717, departing from Palermo Central Station and headed to Punta Raisi, was stopped at the Palazzo Reale Orleans' second platform, avoiding crossing with trains No 22714 and No 8672. After departing once again, the train crashed, striking the bumpers of the dead-end track and damaging a section of the line.

After striking the bumper, and in turn the retaining wall, the convoy came to a halt against the same wall; however, all wheels remained on the track, avoiding the cluttering of the adjacent track (No 1); the straight track through the station.

Following the event, the trains on that service were suspended and an alternative bus service between Palermo Central Station and Palermo Notarbartolo was provided.

The train service remained disrupted up until 16.32 the same day.

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The Board came to the conclusion that, beyond a shadow of a doubt, the accident was caused by the departure in error of the 22717 train that had been stood still at platform 2, Palazzo Reale Orleans rail station, waiting for the double cross passing. Furthermore, the train moved incorrectly after the passing of the first train-crossing, even though the starting signal remained at stop; as a result, the train hit the bumper at the end of the dead end track, before crashing into, and finally coming to a halt at, the same buffer wall.

The Board also concluded that the train's incorrect departure occurred due to a series of mistakes and failures, be it on behalf of the driver or the conductor.

08.06.2008 – 14 .7.2008 – Derailments at various Italian sites

During the first half of 2008, there was a phenomenon of several train derailment incidents.

Therefore, in July of the same year, investigations were launched into a selection of the derailment occurrences, as a means to identify common causes, to establish future recommendations for the improvement of rail safety and to prevent further accidents. In turn, a special Board was appointed to examine nine derailments that took place between 8th June 2008 and the 14th July 2008.

The incidents taken into consideration are outlined below:

- 08.06.2008 – Goods Yard at Maddaloni
- 21.06.2008 – Entering Vipiteno Station
- 24.06.2008 – Exiting Padova Station
- 26.06.2008 – Exiting Pisa Station
- 26.06.2008 – Exiting Contursi Station
- 05.07.2008 – Entering Firenze Castello Station
- 10.07.2008 – Exiting Milan's Station
- 12.07.2008 – Entering Genova Brignole Station
- 14.07.2008 – Entering Goods Yard at Maddaloni

Numerous examinations of the scene of the accident, investigation reports by the infrastructure manager RFI and Trenitalia, which was the railway company in question, acted as the basis of the examinations into these occurrences.

The fact that the information, contained in the said reports, was significantly insufficient was also brought to light by the Board.

Despite the fact that the number of occurrences examined was, unfortunately, restricted for a statistical investigation and that the time-frame was also rather limited, the Board noted that the speed of the trains was not an influence on the causes of the derailments; in so much as the derailments occurred in line with the permitted track speeds, usually set at lower than 30 km/h.

The Board was also able to attribute the cause of the derailments (for the majority of the examined cases) to the lack of various infrastructure elements (the track handling procedure, soldering not followed out in line with regulations; track wear and tear; faults on the fixing of the track at the crossing; incorrect sizing of the track; subsiding of the fittings; etc).

The work carried out by the Board confirmed that the elevated number of derailments constitutes a genuine phenomenon, which should be continually observed and studied by the body put forward, so as to identify appropriate solutions for its reduction.

With this in mind, the Board has made a series of recommendations referred to in Section 5.

08.08.2008 – Potenza Central Station

On the 7th August 2008 at 13.45 a convoy of two locomotives and 19 freight wagons, loaded with scrap iron and destined for a steel plant, arrived into Potenza Central Station. After which, two

of Trenitalia's Cargo Division shunter trains transferred, in a single switch operation (with a locomotive), the first nine wagons onto the track.

The following morning, at around 09.00, the troop train [Translator's Note: sic], which was made up of the locomotive and the remaining ten wagons and was switched in a single operation (operated by the second shunter train), incorrectly passed through the siding, colliding with another two empty wagons that had been moved by the other locomotive, which was operated by persons employed by FERRIERE NORD. Furthermore, the Trenitalia Cargo Division's operator threw himself from No 225 5045 locomotive around 100 metres before the impact, leaving the locomotive to continue along the track without supervision.

Three people, who were operating around the plant and involved in the manoeuvre of the two empty wagons moved by the locomotive operator Greco, were injured during the collision. The driver, an employee of Ferriere Nord, involved in the accident sustained serious injuries and passed away on 13th August 2008. One employee was slightly bruised and was discharged from the hospital the day after the accident.

Five wagons suffered serious damage as a result of the impact, whilst the Trenitalia shunting locomotive was completely destroyed. In the collision, some of the five wagons reared up against the Ferriere Nord office building, causing serious damage to the structure and crushing numerous cars parked in the square opposite.

It should also be noted that the Trenitalia convoy, when crossing the first level crossing of an unattended, pedestrianised road, collided with a car that at exactly the same time, had finished crossing the level crossing; thankfully, it was only a mild collision.

A few violations of the rules governing the railways (PGOS - ISM - Industrial Operating Rules of the Union) by both Trenitalia staff and RFI emerged from the investigations.

The investigator in charge found that the area crossed by the railway at the time of its construction (the early seventies), consisted of open country and was devoid of any traffic hot-spots. Therefore, the two level crossings (crossing local roads), did not qualify as single points of danger.

Furthermore, following the earthquake of 1980, the countryside situated to the north of the industrial area had experienced a widespread and concentrated urbanisation, which had led to a notable increase in traffic, unforeseen at the time of the railway's construction; therefore, it no longer complied with the safety conditions established during its construction.

In light of this, as well as the worsening of the track rail-link slope (in particular the first section of the ridge leading to the plant), the investigator has recommended that the points (switches) be fitted with special electronic controls, operated from the central electric traffic control unit (ACEI), both for the safety of the trains at the level crossing and the public.

If electronic controls had been in place, that would have doubled the safety of the position of the point, something which manual operation would not guarantee.

Furthermore, the same investigator suggested a supervision activity to be actioned by the relevant structures of RFI and Trenitalia, with the aim of avoiding improper conduct by staff in charge of movement and manoeuvre.

4.4.3 – Investigations launched in 2009 but not concluded within the year

22.06.2009 – Prato-Vaiano

At 04.56 on the 22nd June 2009, the freight train, No 55399, stopped on the track for the repair of the automatic brake, caused by the detachment of the couplings between carriages 15 and 16, following the exit of the cars from the headquarters at 25+585 km.

After the derailment, the front right side of the regional train locomotive No 11674 (in transit on the adjacent track) collided with oversized items on the freight train. The incident halted any movement between Bologna and Prato from 04:56 to 09:36, causing train cancellations and delays. Activity was back only up and running on 1st July 2009; no harm was done to any persons, only objects (which are outlined below):

“Direct” damages to the rolling stock €16,150

“Direct” damages to infrastructure €5,447

“Indirect” damages to:

- delays to the 26409 long-distance trains
- delays to the 4856 regional trains
- delays to the 2240 freight trains
- the complete suspension of 234 trains and the partial suspension of 126 trains

With reference to the investigations carried out, the Board has identified a defect in the leaf spring suspension of the main wagon No 238374070239, which is believed to have caused the accident; responsibility for the structure or the persons employed by RFI, who were involved in the incident, has not been identified.

29.06.2009 – Viareggio (investigation still on-going)

a) The Board in charge is currently conducting its own investigations into the disaster at Viareggio; the Directorate has been prompted to bring the present report forward, including all works completed by the Board in charge so far, due both to the seriousness of the incident and the desire to learn what happened – as far as is possible within the current law regulations and the issue of transparency.

Immediately after the incident at Viareggio, the Directorate-General set the necessary actions in motion, appointing an Investigating Board.

The railway incident, dated 29th June 2009, took place at Viareggio station at 23.48: in line with the legislation outlined in Article 19 of the Legislative Decree 162/2007, the *Directorate-General* (at around 01.30) set up an Investigating Board, rendering the activities of the said Board immediately effective, with the aim of obtaining the site alignment and technical inspections, as well as photographs of the carriages.

In the first few hours of 30th June 2009, the *investigation officers* arrived at the scene of the accident.

Yet, starting the actual investigation only became possible once consent had been granted by the rescue team, who had established a cordoned area around the entire site (given the dangerous presence on the other tracks of freight trains/wagons containing LPG).

The Investigating Board had to act as permitted by the Lucca Public Prosecutor; given that the Railway Police had sequestered all travel documents relating to the train, according to the regulations of the magistrate in charge of the investigation.

On the morning of 30th June, the Board sent a formal request to the Lucca Deputy Public Prosecutor, requesting permission to inspect the vehicles involved in the accident and the places put under judicial sequestration, to carry out further inspections on the accident site and to acquire a copy of the case started by the assessing body.

The Board proceeded to inspect all involved sections of the accident, noting and photographing the technical details of the train carriages, with particular reference to the wheel-sets of the wagon that was derailed.

The Board examined the state of the infrastructure installation (parallel track, horizontal and vertical alignment, durability of the crossings, state of switches, etc); the investigation also

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extended to the state of the train controls, and the various mechanical carriage components (deemed important for the security of the rail system), verifying their operational state and their integrity.

Subsequently, two other inspections were carried out at the accident site (2nd and 4th July) and an investigation into the freight wagons involved in the accident has begun; official requests have been submitted so that all documentation deemed necessary can be acquired.

As already noted, on the 30th June 2009, there was a wheel-set structural failure on the first bogie of the tank wagon (in the direction of travel of the train), caused by the fracture of the axle spindle; this could indicate the direct cause of the accident.

The management of the investigations at present should be directed towards identifying the direct cause (as well as the *indirect causes*), in order to improve the safety of rail traffic.

In general, the indirect causes are divided into the following specific areas:

- *Causes related to technical issues (design, construction, etc);*
- *Causes relating to rules, procedures and controls;*
- *Causes related to competence when maintaining rolling stock.*

One line of investigation currently being pursued is a comparison of the accident with identical, or virtually identical, events that also occurred in recent times; it refers in particular to:

- the incident that took place at the Firenze Castello station on 26/03/2008 (broken axle);
- the incident that took place at Prato-Vaiano on 22/06/2009;
- the incident that took place on 26/03/2004 at Albate Camerlata (province of Como);

The investigation activity is carried out in accordance with the rules and procedures outlined in the existing legislation: the completion and improvement of both the final investigation report and the recommendations will depend on the acquisition of all necessary documentation and the results of laboratory tests taken from materials that are currently sequestered; formal contacts with the investigating magistrate were taken so that all necessary documentation, especially with regards the sending of materials to the laboratory test, can be acquired.

It is still, to this day, impossible to carry out tests and checks on items subject to seizure by the judicial authorities.

Contacts with the parties concerned (Article 22(3), of Directive 49/2009 and Article 21(2), of Legislative Decree No. 162/2007) have also been started, to allow all parties involved (the railway and infrastructure manager, safety authority, victims and their relatives, owners of damaged property, manufacturers, emergency services involved and representatives of staff and users) to express their thoughts, to have access to the results and to present their opinions and views to the investigation.

The final investigation report will be completed within 30 to 40 days, once all of the above mentioned elements have been collated.

- b) On 18th December 2009, the “First Draft of the Final Investigation Report” was completed; it was sent (after specific request) to the Criminal Investigation Department to the Lucca Public Prosecutor, who sent the following notes dated 17/02/2010:
- permission granted for the “First Draft of the Final Investigation Report” only to be sent to the interested parties
 - permission refused for the disclosure of the annexes of the draft itself.

Despite these opinions cited, official contact with interested parties have continued (in accordance with Article 22(3) of Directive 2004/49/EC and Article 21(2) of Legislative Decree No. 162/2007), to allow everyone the chance to express their thoughts, to have access to the investigation data and to present their opinions and views on the investigation itself.

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Even the ERA (European Railway Agency), which was sent a copy of the “First Draft of the Final Investigation Report” (without attachments) has not requested further details and awaits the outcome of the investigation.

It must be noted that, with the absence of authorisation to proceed from the Prosecutor of the Republic of Lucca, tests and laboratory tests on the mechanical parts of the train can not be carried out: said tests, as already shown, are believed to be essential in identifying the indirect causes of the accident.

c) A conference on rail safety, entitled “Rail Safety: The Way Forward” was held in Brussels on 9th August 2009.

The conference was organised after the train accident at Viareggio on the 29th June 2009; during the conference, a summary report was submitted by the then interim CEO, with the consent of the Judicial Authority.

5 – SUMMARY OF THE RECOMMENDATIONS MADE FOLLOWING INVESTIGATIONS AND RESPONSES BY THE ADDRESSEES

Below is a tabular summary of both the findings and the recommendations made.

5.1 – Summary of recommendations

EVENT	Recommendations by the Committee (C) and the Office (U)	Response by ANSF	Response by RFI
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<p>Anagni 24.01.2009</p>	<p>C: 1) a modification to the shear traction control, through installation of a pressure switch for the detachment of the slave locomotive, would contribute to a noticeable decrease in the levels of stress on the tow when the emergency brake is actioned by the end of the train, synchronising the actioning of shear traction and electric braking between the 'master' and 'slave'. 2) a more adequate maintenance of the connecting parts between the convoy's carriages and a verification of the correct positioning of the train's elements would help keep the stress levels of this items within the projected boundaries, thus limiting the "exaggeration" of the stress phenomena caused by the braking of the train; 3) necessity to record the pressure in the general pipe. The lack of this information means that the braking usage has to be based on other data recordings. It is important to record this information in both the head and tail locomotives, as well as the measurement of the pressure in other pipes where possible. U: 1) Need to prepare the functional modifications of the shear traction control, through the use of a pressure switch for the detachment of the slave locomotive, so as to reduce stress levels on the tow bars; 2) The need to record the pressure flow in the general pipe, in particular with regards the head and tail locomotives; 3) The need to size the tensioners based on a scrupulous evaluation of the actual maximum stresses; 4) The need to replace any tensioners, over which there are doubts about their correct size;</p>	<p>ANSF stipulated that Trenitalia SpA replace all tensioners in the ETR 500 fleet by December 2009. They were also asked to implement the required changes to the ETR 500 fleet by modifying the control system of the train (determining the state of the SSB "slave" and coordinated management of the traction control).</p>	<p>None</p>
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<p>Derailments between 08.06.2008 and 14.07.2008</p>	<p>C: 1) Preparation of a report on the state and condition of the infrastructure and the rolling stock, before the removal of the rolling stock and the reinstatement of the track; said report could be prepared by those responsible for the breakdown waggon;</p> <p>2) Take steps to ensure the strict compliance with specific legislation, in particular the collaboration and information-flow between the various sectors and the parties involved at the accident site;</p> <p>3) Assessing the case for third member parties from the infrastructure sector and rolling stock to be involved in the RFI Boards;</p> <p>4) Use of initiatives to empower the personnel, tasked with drawing up reports and fact sheets, with the technical rules in force;</p> <p>5) The use of precise measuring instruments, not just objects that are open to interpretation and/or personal readings, and a greater attention to their maintenance, to assess the exact progress over time, of both railway/train (carriage) measuring tools and the temperature of the 'soldered tracks'.</p> <p>6) Take steps to verify the compatibility of the infrastructure standards, as well as the standards of the rolling stock and carriages; and collection of information on the phenomenon of the face surface of the wheel rims. The use of automatic or semiautomatic tests together with certified equipment;</p> <p>7) Involvement of staff responsible for the inspections and checks in the "Management of Safety Checks", following maintenance repairs on the line;</p> <p>8) Implementation of a "Management of Safety Checks"</p>	<p>ANSF did not add any further requirements to the specific information contained in the report.</p>	<p>1) RFI concluded that 'special agents' normally come in ahead of the arrival of the breakdown waggon; whereas staff from the breakdown waggon do not have the technical skills required;</p> <p>2) RFI reports that they have asked staff for a strict observance of the rules;</p> <p>3) RFI states that there are two specific regulations: one that governs the procedures for investigations to be carried out after an accident; the other covers the possibility for third member parties to be involved and will use the results of the reports in the future;</p> <p>4) RFI will endeavour to raise awareness amongst staff;</p> <p>5) RFI states that it already uses precise measuring instruments, which are periodically calibrated; it is also in the process of installing systems throughout its entire network, which will act as an automatic monitoring of rail temperature;</p> <p>6) RFI states that the investigations are carried out in line with both manual and automatic equipment, which are in accordance with current standards compatible</p>
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<p>Palermo- Palazzo Reale d'Orleans 19.10 2004</p>	<p>C: 1) Begin regular character initiatives and controls on the behaviour of the personnel, so as to counter bad habits or, worse still, the violation of regulatory standards. Similar action should also be taken to raise an awareness amongst staff of the procedures, both during initial employment training as well as subsequent training programmes; 2) Examine making information about any changes with crossroads or priorities obligatory amongst train staff, not only through fixed signage but also verbally, with the use of official reports or telephone communications.</p>		
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<p>Potenza Station 08.08.2008</p>	<p>C: 1) For the safety of the trains and the public at level crossings, it is recommended that current switches on rail-links be provided with electronic controls, to be operated by the ACEI; 2) An increase in activity (by the internal structures of RFI and Trenitalia) of supervision and checks, and the education of the staff on the subject of safety; both active and passive steps are to be taken, with the aim of preventing improper conduct by staff working in moving and manoeuvre.</p>	<p>ANSF decided to conduct its own investigation. On the basis of its investigation, it requested that Trenitalia and RFI monitor their organisation processes, which could have instigated the causes that brought about the accident, more effectively; in particular, those that provide the interface between two different operators.</p>	<p>RFI reported that appropriate training measures have been implemented, ones aimed at improving the skills of the personnel involved and the application of those put-forward by the CCNL. Moreover, concise information on the recurring experiences, taken from the incident in question, was circulated by the Management Directorate to all the Management's Directorate Departments, with a call for the proper use and storage of keys, as well as special attention to be placed on control activities and internal audits.</p>
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5.2 – Current situation regarding recommendations

As indicated above in the responses from ANSF and the Infrastructure Operator, almost all the recommendations have been met either with a response or with a concrete implementation of the points made in those recommendations.

The recommendations made to ANSF, in particular, resulted in ANSF adopting arrangements that followed these recommendations or that were adopted independently, following their own analysis of the accidents concerned.

For some recommendations (as indicated in the description) the effects of the initiatives indicated in the recommendations are still being assessed.

In the case of a few instructions, where the response is not entirely in line with the recommendations, the degree to which the initiatives are considered appropriate or necessary, will have to be clarified in more detail.

6 – WORK IN 2010

The tables below illustrate:

- investigations launched in 2010
- investigations launched in previous years and concluded in 2010

6.1 – Investigations launched in 2010

Date of accident	Place	Type of accident/incident
From 24.01.2010	Various	Signal Passed At Danger (SPAD)
From 18.09.2009	Various	Leakage of dangerous goods from railway wagons
From 21.04.2010	Various	Problems with the functioning of the level crossings

6.2 – Investigations launched in previous years and concluded in 2010

Date of accident	Place	Type of accident/incident	Date of finalisation
01/09/08	Motta S. Anastasia	Leaving from the station, train No 3832 collided with 2 operators on the line	23/06/10

01.09.2008 – Motta S. Anastasia

On the 1st September 2008 at 11.25, train No 3832 from Palermo Central Station bound for Catania Central Station, passed through the Motta S. Anastasia Station, colliding with two workers stood next to the 2nd switch point at the 223+132 km site along the Palermo – Caltanissetta – Catania railway line, killing both of them.

The impact occurred in the proximity of the said switch point, where the deceased was presently cutting a track bolt with a grinder trimmer, near the track and with his back to the oncoming train. The noise caused by the apparatus during the work and the incorrect application of the safety rules resulted in the said person being unable to notice the arrival of the train, despite the train driver having sounded his whistle several times. Unfortunately, the train collided with the two maintenance workers, despite the rapid braking by the train driver.

The Board determined that the accident in question was caused by the incorrect, or lack of, application of the existing rules on safety and the protection of the railway yards, in particular those outlined in 'Instructions for the Protection of the Yards'.

Furthermore, elements referring to the arranged organisational security, which should have been implemented on the day of the accident, according to the rules of free-track sighting, were not correctly applied, in particular regarding:

- the availability of enough staff for protective organisation;

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- the suitability of the personnel involved;
- the prior and structured allocation of duties;
- the timely sighting of trains;
- the use of means of signalling, efficiency, or characteristics thereof to allow for all circumstances to be precipitated;
- the use of individual protective equipment/gear;
- the availability of tables showing working rail yards

The Board stressed that the proper application of the rules identified in the free-track sighting would have prevented the occurrence of the accident in question, and they felt it appropriate, following this particular incident, to make the following recommendations:

- initiate and carry through a process of modifying rules and procedures governing the protection of the working rail yards;
- opt for, whenever possible, the suspension of the track, to be implemented preferably in conjunction with the "staging of the time-table";
- increase the level of security, where necessary, using the free-track sighting in particular for:
 - the progress of works at the station
 - the minimum number of persons to be exclusively involved in activities to protect the site
 - the determination of the 'safety period'
 - the installation of electronic warning equipment and for the protection of the work site
 - the effectiveness of staff training activities
 - the planning of activities and areas of intervention for teams, so as to have the ability to impose delays on trains already in transit on those routes affected.

6.3 – Accidents and incidents recorded in 2010

<i>No</i>	<i>Type of Accident</i>	<i>No of Accidents</i>	NOTES
1	Collisions with trains with one another or with other obstacles	33	
2	Train Derailments	8	
3	Interruptions to Traffic for at least 6 hours	28	
4	Fatalities and/or personal injuries	125 47	Fatal collisions Non-fatal collisions
5	Damages equal to at least €150.000	--	
6	Collisions between work trains	--	
7	Fires on rolling stock	--	
8	Uncoupling of Passenger Trains	--	
9	Signal Passed At Danger (SPAD)	13	
10	Runaway Vehicles	4	
11	Level crossings improperly opened	6	
12	Events involving trains transporting hazardous goods	24	
13	Serious events occurring in sidings or depots	--	

14	Other	2	
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Table 5 – Registered accidents and mishaps in 2010 (revised on 20th September 2010)

It should be pointed out that when the accidents and incidents recorded were examined and compared with the documentation in the files held by the Directorate, certain recurrent phenomenon became evident, about which it was decided to launch the investigations indicated above.

The following are incidents recorded by this Directorate General for the three investigations in question.

Signal Passed At Danger (SPAD)

No	Date	Line	Train No
1	24/01/10	Chiasso - Milano	25067
2	26/01/10	Bologna - Piacenza	6485
3	09/02/10	Nodo di Bologna	65552
4	16/02/10	Rovigo - Verona	5562
5	01/03/10	Bologna - Vignola	11461
6	12/05/10	Brennero stazione	43302
7	22/05/10	Brennero stazione	88515
8	31/05/10	Serengo - Bergamo	10741
9	04/06/10	Novara - Torino	4851
10	21/06/10	Domodossola - Milano	20225
11	23.06.10	Genova - Ventimiglia (Loano)	11363
12	30.06.10	Napoli - Battipaglia	587
13	6.09.10	Genova - Pisa	11267

Table 6 – SPAD registered in 2010 (revised on 20th September 2010)

Leakage of dangerous goods by railway wagons

No	Date	Line	Train No	Causes
1	25/01/10	Latisana - Trieste	53662	Gas leak
2	01/02/10	Verona PN Scalo	54426	Loss of dangerous goods
3	07/02/10	Ventimiglia - Genova; parco Roja	54419	Loss of LPG
4	10/02/10	Villa Opicina (TS)	45700	Loss of LPG
5	17/02/10	Ventimiglia - Genova; parco Roja	54405	Loss of dangerous goods
6	14/03/10	Ventimiglia - Genova; Sestri Pon.	54419	Loss of LPG
7	25/03/10	Ventimiglia - Genova; parco Roja	64353	Loss of dangerous goods
8	24/04/10	Brennero - Verona	42137	Loss of dangerous goods
9	27/04/10	Ventimiglia - Genova; parco Roja	48353	Loss of dangerous goods

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10	29/04/10	Domodossola - Arona	49619	Loss of dangerous goods
11	30/05/10	Nodo di Roma	59018	Loss of dangerous goods
12	04/06/10	Ventimiglia - Genova; parco Roja	74011	Loss of dangerous goods
13	07/06/10	Bolzano - Brennero	42139	Loss of dangerous goods
14	21/06/10	Tarvisio - Udine	48129	Loss of dangerous goods
15	07/07/10	Tarvisio - Udine	48237	Emission from tanker
16	16/07/10	Ventimiglia - Genova; parco Roja	49297	Emission of dangerous goods
17	22/07/10	Verona - Bologna	55336	Emission of dangerous goods
18	24/07/10	Villa Opicina (TS) - Trieste	48705	Loss of dangerous goods
19	28/07/10	Ventimiglia - Genova; parco Roja	49297	Liquid spill
20	24/08/10	Trieste - Villa Opicina (TS)	83484	Goods spill
21	25/08/10	Torino - Novara	60221	Emission of dangerous goods
22	25/08/10	Tarvisio - Venezia	41849	Load spill
23	26/08/10	Venezia - Tarvisio	42201	Goods spill
24	17/09/10	Ventimiglia - Genova; parco Roja	48353	Loss of LPG

Table 7 – Leakage of dangerous goods recorded in 2010 (revised on 20th September 2010)

Problems with the functioning of level crossings

No	Date	Line	Train No	Causes
1	21/04/10	Bari - Taranto	12628	Level Crossing (LC) Km 36+557 barriers open
2	02/05/10	Bergamo - Rovato	4903	LC unduly open
3	21/05/10	Brindisi - Taranto	3616	LC unduly open
4	12/06/10	Campoleone - Nettuno	12204	LC unduly open
5	13/09/10	Bassano del Grappa - Padova	5841	LC unduly open
6	19/09/10	Parma - Brescia	24188	LC unduly open

Table 8 – Problems with the functioning of level crossings registered in 2010 (revised on 20th September 2010)

7 - CONCLUSIONS

In light of the information referred to in the previous pages, paying particular attention to those which illustrate the accident rate on Italian railways, various considerations can be drawn, ranging from purely technical issues, to ones of a more rational nature.

Naturally, on the one side there is a want and a need to carry out and maintain safety conditions efficiently and in the time allocated; on the other, there is a need to satisfy expectations, be it those of the consumer or the operator.

Simply put, it is the balance between “machine” and “man”. However, given that man is

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viewed as the centre of the Universe, it is impossible to consider machine or man on the same terms.

Leaving this discussion to sociologists, philosophers and other specialists, focus and attention should be placed, instead, on the purpose and aims of the Permanent Investigating Body; these can be briefly summarised as “guaranteeing the maximum security for the railway system”.

This axiom entails a few important considerations:

- the incident, or set of incidents, can not be assessed solely from a statistical point of view, unless zero accidents, deaths or injuries have occurred in the time period of 365 days; this is the goal that should be strived for, and achieved, as soon as possible. Even when faced with a decrease in the number of accidents, the situation cannot be described as satisfactory, until this aforementioned aim is achieved;
- an accident occurs, be it for direct causes (one or more happening simultaneously) or for indirect causes, which by their very nature bring about the direct causes (e.g. a broken axle);
- of course, the indirect causes may be ascribable to alternative sectors (planning, construction, maintenance, regulatory, procedural, inspection, maintenance, etc.);
- careful analysis of the final investigation report notes that in many cases the accidents are not caused by the absence or lack of technical standards or operating rules and procedures, but to a non-compliance or a partial-compliance with said guidelines;
- the identification of the direct causes does not necessarily mean the elimination of any given type of accident. It can be argued that, in order to remove the direct causes, the indirect causes must also be tackled; this notion focuses both on the constant training of operational staff and the procurement of high-quality products.

In outlining these concise considerations, I certainly do not proclaim to have ‘found’ the elusive key to establishing maximum security. However, they corroborate the notion that at the centre of everything is 'man'; and, therefore, it is fundamental that we favour individual responsibility and a complete awareness on the part of professional figures, as well as the consumer, to understand and be conscious of the important role that they play.

It should always be remembered that everyone’s safety depends primarily on a scrupulous and vigilant compliance with the norms and rules, which everyone, for their part, must adopt.

Rome, 30th September 2010

Director-General
Giovanni Battista Ravera