Ministry for Infrastructure and Transport

DIRECTORATE-GENERAL OF THE ITALIAN RAILWAY INVESTIGATION BODY

Annual Report 2010

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Foreword by Director General

The annual report on the activities of the Directorate General of the Italian Railway Investigation Body in 2010 is prepared in accordance with Directive 2004/49/EC and Legislative Decree 10 August 2007 No 162. This year, for the first time, the report is published in the form of booklet to facilitate easy and concise consultation by everyone. The report is intended as an overview only. A more detailed treatment of investigations and procedures is provided in the periodic reports submitted to the Minister of Infrastructure and Transport during the year.

During 2010 the Directorate General of the Italian Railway Investigation Body (hereinafter the "Directorate General") saw a change in its organisation with the recruitment of two staff engineers in June and Divisional Directors in December.

This new organisational structure, which now satisfies in part the Directorate General's overall resource requirements, began operation in the second half of 2010 after I took office in October, inheriting the legacy of the previous Director-General, in terms of experience and orientation.

In this brief introduction, I wish to summarise the activities inaugurating my mandate, indicating the two main points which in my opinion indicate the extent of a new impetus towards proposal-making, while the report itself may be referred to for information about further aspects:

- the renewal of relations with the European Commission (Directorate General MOVE and the European Railway Agency ERA) and the start of major bilateral relationships with investigative bodies in other EU countries;
- the commencement of a meaningful collaboration with judicial authorities in relation to rail accident investigations. This type of collaboration was also specifically requested at European Commission level. The Commission complained about Italy's failure to comply with the provisions of Directive 2004/49/EC which expressly provides for a process of virtuous cooperation – while respecting respective competences – between the judicial authorities and the National Office responsible for investigating technical causes. In Italy the national office responsible is in effect my Directorate. The starting point of this collaboration was the decision of the Tribunal of Lucca to permit the Commission of Inquiry of this Directorate General (appointed to investigate the Viareggio railway accident of June 2009) to participate in the special evidentiary hearings initiated by the preliminary investigating magistrate (GIP) of Lucca during the current year 2011. The technical investigation of the accident performed by the Directorate General runs in parallel with the investigation started by the judiciary. Activities in 2010 and in particular in the first half of 2011 consisted of the testing of the materials associated with the special evidentiary hearing.

Foreword by Director General

I must conclude this brief note of introduction with an appropriate reflection on the victims of the accident in Viareggio

Here, I think it is important to note that over the last two years, following the Viareggio derailment we have seen the beginnings of a complex process of research, analysis, drafting of legislation and regulations at the national and European level, aimed at the prevention of similar occurrences.

It is my conviction and personal hope that this process has in part already led and will further lead – as the technical mechanisms underlying the event are gradually clarified – to a new concept of safe transportation of hazardous goods by rail, with the development of a new technical awareness in this specific transport sector.

I believe that this will lead to a substantial reduction of future accidents. Targeted legislative and regulatory measures should as far as possible ensure a reduction in the numbers of what will unfortunately and inevitably remain unpredictable and imponderable events. These measures will advance the potential and necessary process of planning and implementation on a technical level.

This certainly will not alleviate the grief of the bereaved families affected by such a tragic loss of life, but I hope that I can at least provide them with something more than a mere expression of condolence. We can assure them that the institutions responsible for rail transport safety are working with the utmost dedication to ensure that the repetition of such a negative chain of events is reduced to an infinitesimal mathematical probability.

Pursuant to Article 19 of Legislative Decree 162/07, the Directorate General of the Italian Railway Investigation Body (DGIF) conducts its remit as envisaged by Directive 2004/49/EC for the purpose of conducting investigations:

- following serious rail accidents;
- following accidents and incidents that, under other conditions could have led to a serious accident, including technical failures of structural subsystems or of railway system components.

Investigations are performed in compliance with EU and Italian regulations and aim to provide recommendations for the improvement of rail safety and accident prevention both in Italy and in other EU member states.

The activities of the various investigative bodies within the EU take place within a process of common application of "best practices", with investigatory procedures and methods being harmonised, thus providing a mutual interchange of best investigative practices applied by the various states in the different and varied sectors of relevance to railway operations and to railway safety understood as a system composed of different elements.

It should be noted that in cases where there is no strictly formal obligation to open an investigation as explicitly codified in the standard, the opening of an investigation by the DGIF is based on parameters of a more general nature. In practice the Directorate General has the discretionary powers to decide whether or not to open an investigation. In exercising its discretionary power it evaluates:

- whether the event is part of a series of accidents or incidents relevant to the system as a whole;
- the potential impact of the event on railway safety at the EU level;
- the media coverage of the event, in order to use this factor as the preferred channel for the dissemination of recommendations following investigations;
- any requests formulated by infrastructure operators, railway undertakings or the Italian National Safety Authority (ANSF).

The range of the investigations and the relevant procedures are established by the *Directorate General* also taking into account the lessons it hopes to learn from the accident or incident for safety improvement purposes.

As is well-known, the regulatory provisions specify that the investigation should not seek in any circumstances to establish fault or liability and above all that the recommendations issued are formulated – in order to ensure the effectiveness of the process – in a clear and detailed way but without sacrificing the necessary generality of scope, where necessary.

The DGIF [*Directorate General of the Italian Railway Investigation Body*] has the status of a third-party technical observer and its responsibility is limited to making specific or general recommendations. The task of deciding the efficient allocation of resources for accident prevention remains the responsibility of political and economic decision makers.

A prime example of these processes of improvement are the potential medium and long-term actions proposed in relation to monitoring and grading the hydrogeological structure of the territory in terms of stability of railway property and especially of the areas above or below the railway lines.

Investigations by the Directorate General in 2010

Based on guidelines issued by the Italian Railway Investigation Body in 2008, the accidents which must be immediately reported by the Italian infrastructure operator are all those listed in the table below. All these accidents, whatever their consequences, must be reported. The purpose of reporting is to enable the Italian Railway Investigation Body to make the decision as to whether or not to initiate an investigation.

The incidents which justify the proposal of interventions to improve rail traffic safety are incidents whose determining causes and critical aspects merit evaluation because of the seriousness of the incident or potential incident (i.e. an incident which through a fortunate combination of circumstances remained a theoretical risk or did not actually result in an incident) or because of the excessive frequency of occurrence. For this reason, the Italian Railway Investigation Body has defined specific criteria for selection of the type of events that must be reported to it – whatever the consequences of the accident – by the Infrastructure Operator and Railway Undertakings.

These criteria, defined at the end of 2008, still represent the points of reference for the acquisition of the data with which the Directorate General operated in 2010. The examination of the information permits a rapid and overall evaluation of the incident and its severity and allows a decision to be taken as to whether or not to open an investigation.

The types of incidents which are to be promptly reported to the DGIF and the number of such incidents occurring in 2010 are detailed in *Table 1*.

Table 1 - Events reported to the DGIF

Type of event	*TOTALS*	NOTES
Collisions	174	Fatal collisions
	59	Non-fatal collisions
Collision between trains or between a train and an obstacle	48	
Incidents relating to trains transporting hazardous freight	36	
Signals wrongly passed by trains	17	
Train derailments, derailments	16	
Level crossings wrongly left open	12	
Uncontrolled movement of railway vehicles	4	
Fires on rolling stock	2	
Uncoupling of passenger trains	1	
Damages amounting to at least €150,000	-	
Collision between work vehicles	-	

Serious incidents occurring in sidings or in depots	-	
Other (incorrect routing, missing slow-down signal)	14	
Interruptions in rail traffic lasting more than 6 hours	41	

Investigation is therefore the main duty of the Directorate General which, from the date of its establishment, established Commissions of Investigation with the remit to investigate individual incidents or series of incidents.
This activity continued in 2010 with the completion of many of the investigations initiated in 2009 and with the appointment of new Ministerial Committees or individual investigators (for details, see *Table 2*).

Table 2The following is a detailed description of the individual events investigated.

Table 2- Investigations in 2010.

	Date of incident	*Place*	*Incident*	*Inquiry end date (Publication of final report)*
Closed at 31.12.2010	01.09.2008	Motta S. Anastasia	Train No 3832 hits two line personnel on its exit from station	23.06.2010
	20.09.2009	Milano Centrale	Empty passenger train derailed during transfer operation	28.09.2010
	from 01.01.2009 to 31.12.2009	various	Derailments from 01.01.2009 to 31.12.2009: analysis of same	28.09.2010
	from 01.01.2009 to 30.10.2009	various	Collision with persons in the station or on the line: analysis of same	01.10.2010
Open at 31.12.2010	from 01.01.2009 to 04.05.2009	various	Accidents relating to passengers boarding or leaving trains in motion	under completion
	22.06.2009	Prato -Vaiano	Derailment of freight train transporting hazardous goods	*(Ended on 05.07.2011)*
	29.06.2009	Viareggio	Derailment of freight train transporting hazardous goods	under completion
	14.12.2009	Verzuolo	Runaway rolling stock	*(Ended on 13.04.2011)*
	19.12.2009	Scala di Giocca	Collision of train No 8921 with an obstacle	*(Ended on 06.06.2011)*
	from 2000 to 2010	various	Improper passing of stop signals (SPAD - Signal Passed At Danger)	*(Ended on 20.05.2011)*
	from 18.09.2009 to 26.08.2010	various	Discharge of hazardous material from railway wagons	*(Ended on 20.05.2011)*
	from 21.04.2010	various	Problems with operation of level crossings	under completion
	04.11.2010	Vipiteno	Splitting of train No 48867 and partial loss of cargo	*(Ended on 07.02.2011)*

01.09.2008 – Motta S. Anastasia, collision with two line personnel

On September 1, 2008, at 11:25 a.m., train No 3832 from Palermo Centrale to Catania Centrale, while passing the station of Motta S. Anastasia, hit two line workers at switch point No 2, located at kilometre marker 223 +132 of the Palermo - Caltanissetta – Catania railway line, causing their death.

The impact occurred near the frog of the switch point, where the deceased persons were cutting a tap bolt, using a portable powered angle grinder operating within the running rail and with their backs to the oncoming train. The noise caused by the tool during the operation, as well as improper application of the rules on the protection of work sites, prevented the two workers from noticing the arrival of the train, although the engine driver had sounded the train whistle repeatedly. Despite application of the emergency brake by the driver, the train collided with the two maintenance workers.

The Commission found that the cause of the accident was the incorrect or non-application of existing rules relating to the safety and protection of railway worksites and, in particular, of the Worksite Protection Instruction.

With reference to the organisational safety instructions which should have been implemented on the day of the accident in accordance with the rules for clearance of the tracks on sight, the rules concerning the following were not correctly applied:

- the availability of sufficient personnel for the organisation of protection;
- the suitability of the personnel employed;
- the prior, structured allocation of tasks;
- the methods for the early sighting of trains;
- the use of effective signalling devices which can be seen/heard in all circumstances;
- the use of personal protective equipment;
- the display of signage indicating the presence of worksites;

The Commission stressed that the correct application of the rules for clearance of the tracks on sight would have prevented the accident in question from occurring and considered it opportune, subsequent to the accident, to make the following recommendations:

- to initiate and complete changes to the rules and procedures regarding the protection of railway construction worksites;
- to opt wherever possible for the adoption of the track interruption procedure, to be implemented preferably in conjunction with “timetable intervals”;
- to increase the level of safety where it is necessary to use the on sight track clearance procedure, in particular for:

- the performance of works in the stations

- the minimum number of persons that must be exclusively assigned to the activity of protecting the worksite
- the definition of the safety time
- the opportunity to provide automatic warning and protection equipment for worksites
- the effectiveness of personnel training activities
- the possibility of planning the activities and intervention areas of work teams, to enable them to force trains in transit on those stretches of line to slow down.

The investigation was completed on 23.06.2010.

20.09.2009 – Milano Centrale, derailment of empty train

On 20 September 2009, in Milano Centrale, Trenitalia train No 23438, began the train-parking movement at 10:25 p.m., authorised and guided by low shunt signals, led by locomotive E464/029, switching onto track 5 of the Fascio EST.

The rolling stock did not stop moving at the low shunt 559 "stop" signal and continued travelling throwing several switch points and switching onto the track named "Asta di Manovra Est" destroying the end buffers and finally plunging, along with one of the five carriages, into the green area of a building adjacent to the line.

The incident caused a drop in electronic voltage across the Milano Centrale station system and on the feeder lines (Novara, Chiasso, Bologna and Genova lines) and caused schedule alterations in order to limit and divert a number of regional trains scheduled to arrive in Milano Centrale from the Genova line.

The investigator assigned ruled out direct causes linked to the management and maintenance of the infrastructure or to the management of internal traffic (definition and route clearance) within the station system.

However, the investigator found non-conformities in the driving of the rolling stock by the driving / shunting crew.

Due to the high number of non-compliances revealed in the incident in question, it was recommended to the railway undertaking that it should carefully comply with the training programmes registered with the Italian National Safety Authority (ANSF) and with the programmes for the updating of professional skills.

Furthermore, the possibility to introduce software or electromechanical warning devices (e.g. hooters) which operate when the train is being driven and train crew leave the locomotive (the devices might be operated for example when the outside door is opened) was also highlighted.

The investigation ended on 28.09.2010.

Derailments at various locations, from 01.01.2009 to 31.12.2009

The Ministerial Commission proceeded to request the infrastructure operator, the railway undertakings and the Italian National Safety

Authority (ANSF) to provide all documentation relating to the infrastructure, rolling stock and train crew involved in each of the incidents reported.

The Commission progressed its activities by individually analysing each report documenting a derailment incident, highlighting the direct causes, the indirect causes and the measures called for by the various Commissions of Inquiry. The investigation reports from the infrastructure operator, the railway undertakings and the Italian National Safety Authority relating to each derailment incident were compared and the differences and similarities between these were analysed. This type of comparison facilitates a more precise understanding of incidents and provides useful pointers for making recommendations for improving rail traffic safety and preventing similar accidents in the future.

The analyses have enabled us to identify the principal causes among the various clusters of causes and the frequency with which these occur. These relate to derailments caused by:

I) failure or non-conformity of wheelsets and connected running gear;

II) failure or non-conformity at switch points.

The investigation concluded that the wide-ranging corrective actions proposed must be tailored to precisely match the types of derailment and should take their causes into account, based on data in respect of an appropriate observation period.

It is clear from what has emerged that the corrective actions should primarily address the freight sector.

One possible action is based on experimental activities designed to gather - and then process - a significant amount of real data. This activity should deal, on the one hand, with infrastructure and with rolling stock on the other hand.

The infrastructure-related activity involves completing accurate surveys of the geometric conditions of arrival and departure routes. The means for conducting these surveys would be passenger carriages which for a few days a year could be scheduled for this purpose. The measurements are repeated at least every six months and extended for a period comparable to that examined here. The stretches of track to be controlled are those which have switch points. If already available, measurements such as those indicated above could be useful to shorten the period of observation. The combination of activities should be carefully planned and organised both for the implementation of measures and for the analysis of the results. All information relating to the nature, location and onset of failures or defects would be of great interest.

In parallel with measurements on the tracks, a measurement campaign of wheel-rail interaction forces should also be taken into consideration, using a wagon equipped with measuring wheels of the simpler type. The wagon would be used in various positions in

the trainset and in various conditions of loading and operation. Tests could be planned on the basis of computer simulations. The tests in question should follow the geometric tests after a certain interval of time, so that they can be limited to the most significant situations observed in the various systems. Another action relates to raising the awareness of drivers, maintenance and inspection personnel regarding the requirement to comply with applicable rules and regulations.
The investigation ended on 30.09.2010.

Collisions in various locations, from 01.01.2009 to 31.10.2009

The investigation focused on the analysis of person-train collision incidents (collisions) occurring from 1 January 2009 to 30 October 2009 on the entire Italian railway network and reported to the Directorate General of the Italian Railway Investigation Body by the infrastructure operator and/or competent railway undertaking.
The purpose of the analysis was to suggest possible preventive measures to reduce the number of these events and to identify hot spots on which to focus particular attention to reduce the incidence of such events.
Analysis of the documentation led to the conclusion that there are three main types of causes of train-person collisions:

1. accident;
2. unauthorised access to the railway line;
3. suicidal intent of the victim.

Based on the investigation of train-person collision episodes, the inquiry focused on issues concerning:

- *protection of railway stations* by personnel of the infrastructure operator and (where possible) of the Railway Police,
- *stronger enforcement of penalties* already provided for by the Railway Police Regulation (Presidential Decree 11 July 1980, No 753),
- *installation of intelligent video surveillance systems* (at least in railway stations and at level crossings in urban areas),
- *installation of barriers* to prevent crossing of the tracks or to prevent access from railway stations to the line.

The investigation ended on 30.09.2010.

Accidents relating to passengers at various locations, from 01.01.2009 to 04.05.2009

These investigations relate to accidents involving passengers getting onto or alighting from trains in motion.
Following the first investigations, the railway undertakings initiated a process to change the methods of opening/closing doors on all trains with centralised door control. Current door-closing methods may be classified by type of train:
- Eurostar trains - centralised door control with remote door closing and door locking on activation of door closing signal by the crew. The doors open at the request of the traveller, subject to the consent of the driver.

- IC and IR (Intercity and Interregional) trains
- remote closing and locking of doors for a specific period of time.
- Vintage trains – manual opening and closing of doors.

A further activity involves analysing notices to users about malfunctions: if there is a door malfunction, a printed notice should be affixed to the door in question, and travellers should be notified in good time so that they can prepare to get off the train and ensure that the door which they intend to use is in service.

22.06.2009 - Prato Vaiano, freight train derailment

On June 22, 2009, at 04:56 a.m., the Trenitalia freight train No 55399, running regularly on the down line track, consisting of 23 wagons and pulled by locomotive E652.152, stopped at kilometre marker 20+480, between the stations of Vaiano and Prato Centrale, due to a rupture of the brake pipe as a result of the detachment of wagon 15 - a two-axle tank wagon - from the next wagon.

The detachment was caused by abnormal running conditions of the tank wagon which, diverted to the progressive kilometre marker 25 +585, had in the meantime lost its wheelsets, damaging the infrastructure for a stretch of approximately 2700 meters.

When the train came to a complete standstill it was split into two sections:

- the first, at the Prato side, with the locomotive, 14 wagons intact and the tank wagon without wheelsets;
- the second, at the Vaiano side, with 8 wagons, the first of which had been damaged by the wheelsets lost from the tank wagon.

The tank wagon slightly overran the clearance gauge of the adjacent track for up-line trains (direction Prato-Bologna), where the regional Trenitalia train No 11674 was due to arrive at 05.05 a.m. (having departed from Prato Centrale at 5.02 a.m.), which lightly struck the tank wagon with a handrail of locomotive E464.

The regional train also came to a halt, stopped by the train driver who was alerted by the sound of impact. The incident may be deemed to have finished at the moment when the second train came to a halt.

The tank wagon was carrying about 20 tons of anhydrous hydrogen fluoride, identified by UNO No 1052 and Kemler hazard identification code No 886. Despite the derailment, the distance travelled for several kilometres and the subsequent collision with the regional train, there was no spillage or dispersal of the tank contents. Subsequently, all necessary operations were performed to secure the wagon and its contents.

No injuries were suffered by the train crew or passengers in the incident.

The incident was the result of the derailment caused by the breakage of the main leaf of the left leaf spring of the first axle (in the train's

direction of travel) of the two-axle tank wagon. This finding was based on the condition of the surfaces of the leaf spring, on the analysis of Commission documents and on the surveys performed on site immediately after the event.

The investigation continued throughout 2010 and has now ended. The Directorate General has published five recommendations.

The Directorate General recommended that the ANSF gradually introduce a programme at the EU and international levels for the implementation of harmonised regulations including the following obligations:

1. To record the results of the tests performed on all components of significance for railway safety.
   The results of the tests conducted on components considered important for railway traffic safety should be included in a common database to facilitate subsequent verification of the condition of the component or the development of any defects or abnormalities detected throughout the life cycle of the component.
   Such data must be made available to all persons responsible for the inspections and to other duly certified and accredited persons responsible for maintenance.
2. To remove from service all safety critical components (leaf springs, wheels, bushes, axles, etc.) which have an incomplete or uncertain service history.
3. To define the "maximum operating life" of safety critical components.
   In order to prevent railway accidents, it may be useful to introduce a maximum time limit for the service life of mechanical safety devices (axles, wheels, bushings, leaf springs, etc.) taking into account the concept of cyclic fatigue to which certain mechanical components are subject during operation.
4. To schedule maintenance operations on the basis of operating times and also on the basis of the number of kilometres in service.
   In order to prevent train accidents, it may be necessary to introduce the concept of maintenance at preset time intervals and at a preset number of kilometres. Inspection and maintenance would then take place whenever the first of these preset conditions is fulfilled. This opportunity should be seriously considered since it is dictated by the different use of wagons based on the structure of the railway market which has changed over the last twenty years, with changing conditions imposed by a supranational economy.
5. To conduct further research and analysis aimed at assessing the possibility / desirability of adopting instruments to detect potential derailment conditions (DDD - Derailment Detection Devices).

29.06.2009 - Viareggio, freight train derailment

The investigations relating to the derailment of 29.06.2009 at the station of Viareggio have continued throughout 2010 and are on-going.

The direct cause of the derailment was identified in 2009 as being the structural failure of a front axle of the first tank wagon.

During 2010, the Commission's work focused on the following activities:

- meeting with the parties involved to also allow them to access the initial results obtained by the Commission, pursuant to the provisions of Legislative Decree No 162 of August 10 2007;
- analysis of rebuttals of these results by the parties involved
- analysis of the reports of RFI SpA [*Italian Railway Network*] concerning the identification of the component which perforated the first tank;
- analysis of the problem relating to the buffer wagons, in certain cases interposed between the locomotive and the cargo.

For other considerations relating to the progress of the investigation into this tragic event, refer to the section dealing with this incident.

14.12.2009 - Verzuolo, runaway rolling stock

On 14.12.2009, at 6:39 p.m., the freight train No 50406 (consisting of 13 wagons loaded with paper, attached to locomotive D100 051 HU) ran away out of control from the station of Verzuolo (in direction of Saluzzo) along the Savigliano-Saluzzo-Cuneo line.

The runaway of rolling stock occurred during train shunting operations by the railway

undertaking SBB Cargo Italia Srl, having completed the shunting manoeuvre out of the railway junction of Cartiere Burgo.

The column of runaway vehicles reached the station of Saluzzo where it impacted with passenger train No 4405, previously evacuated by Trenitalia personnel, after a telephone alert by personnel of the RFI.

The investigator assigned identified the direct cause of the incident to the loss of continuity of the main brake pipe which made it impossible for the train crew to apply the train brakes.

Other factors also directly caused the incident:

1. Failure to activate the emergency stop
2. Failure to activate the handbrake, not present on the last wagon, by the shunter of SBB Cargo Italia Srl.

The indirect cause of the accident is, on the other hand, due to the improper conduct of the drivers and shunting personnel who were responsible for composing and inspecting the train and for shunting the train out of the junction.

The investigation continued throughout 2010 and ended on 13.4.2011. The investigation made a number of recommendations addressed to the railway undertakings.

19.12.2009 - Scala di Giocca, train collision against an obstacle

On 19 December 2009 at 06:12 a.m., Trenitalia train No 8921, connecting Porto Torres - Ozieri - Chilivani, consisting of railcar Aln 668-3205 (front of train) and Aln 663-1173, at kilometre marker 31+531 struck an obstacle occupying part of the railway station at the left side of the driver's cab. The collision caused the derailment of the front Aln, the death of the driver, slight injuries to passengers and crew and damage to the rolling stock and infrastructure. The second Aln remained on the track.

The investigator assigned found that the event was not attributable to rail traffic problems. Given the absence of any doubt about the direct cause of the accident (collision of rolling stock against a stone obstacle obstructing the clearance gauge), analysis of documentation supplied to the DGIF shows that the infrastructure operator of the place where the accident occurred had put in place works to protect the railway line in question.

The examination of the incident led to the issue of a recommendation to the Italian National Safety Authority to continue its activities already underway in relation to the issue of hydrogeological risk. The recommendation advised the infrastructure operator to put in place or reinforce existing works and surveillance and monitoring operations in those areas where there was a potential risk of landslides damaging infrastructure. The infrastructure operator was also advised to systematically check the efficiency and effectiveness of railway traffic safety measures.

The investigation continued throughout 2010 and ended on 06.06.2011.

SPAD at various locations, from 2000 to 2010

The investigation related to a series of incidents of improper passing of stop signals at danger (Signal Passed At Danger - SPAD) which occurred on the national railway network. Recent incidents were focused on.

The Ministerial Commission has identified human error as the direct cause of the incidents.

The indirect causes can therefore be attributed to altered psychological and physical conditions, insufficient attention, failure to follow procedures or poor training of personnel.

The investigations, started on 21.06.2010, were completed on 20.05.2011.

Loss of hazardous material at various locations, from 18.09.2009 to 26.08.2010

The investigation focused on railway incidents involving trains carrying hazardous materials, from 18 September 2009 (train No 54493), up to 26 August 2010 (train No 48129); in recent times these incidents appear to be unusually frequent.

The investigations identified as the principal direct causes of the incidents, defects in mechanical seals or the incorrect positioning of certain components thereof. In certain cases the loss of hazardous material was caused solely by the improper tightening of the closing components of the tank wagons.

Among the indirect causes identified by the Ministerial Commission were shortcomings in inspections to verify that no material would be lost from wagons and to verify the tightness of sealing components, and poor maintenance of the tank wagons and equipment.

The analysis of the incidents, the dynamics and the causes has resulted in two recommendations to the Italian National Safety Authority relating to a necessary clarification of responsibilities during certain stages of the international transportation of hazardous materials, and the need to take or continue to take coordinated action with the individual national safety authorities of neighbouring countries aimed at intensifying inspections of trains transporting hazardous materials. This is because it was found that the largest number of these events occurred on tank wagons from abroad and especially from France.

The investigations, started on 21.06.2010, were completed on 20.05.2011.

Problems at level crossings at various locations, from 21.04.2010

Investigations continued in 2010 (and are nearing completion) into the problem of level crossings being improperly opened during the passage of trains.

04.11.2010 - Vipiteno

Train No 48867 of the railway undertaking RTC (Rail Traction Company), consisting of a main locomotive, a secondary locomotive and a trainset of 20 double-deck car transporter wagons, departed Brennero for Verona Q.E. at 9:45 p.m. On arrival at the outgoing points at the station of Vipiteno it stopped because the emergency brake was applied following the rupture of the main brake pipe. This was in turn caused by the splitting of the Laaeks wagon, third from the front, into the two half-wagons composing it, due to the loss of the pin of the coupling joining the two halves of the rolling stock.

There was material damage to the wagon, the load and the infrastructure and traffic on the line was disrupted.

The Ministerial Commission assessed the event as being attributable to insufficiency or absence of control of a recent maintenance intervention performed on the central coupling of the wagon. The Commission indicated that the inspection of towing equipment should be more careful and systematic.

Given the outcome of the investigation, having examined the documentation collected and having heard from various persons involved in different ways in the investigation itself, and particularly in view of the information provided by the Proprietor of the wagons, the Commission issued the following recommendations:

- the draw gear, since it is connected with operational safety, must be subject to systematic (not "random") performance checks during maintenance;
- these checks must be performed wherever possible by two different persons.

The investigation ended on 07.02.2011.

Principal horizontal activities completed in 2010

In September 2010, activities relating to the preparation of the following documents were completed:

- Handbook for Investigators, a manual to assist investigators in their activities from the time of their appointment by the Minister until their arrival at the accident site.
- Glossary of current railway terms in use in international relations and communications (from English to Italian and from Italian to English).

Activities relating to the preparation of the following document commenced in December 2010:

- Draft Ministerial Decree - to be issued in agreement with the Minister of Economy and Finance - provided for by art. 18, paragraph 2 of Legislative Decree 162/2007 and governing, inter alia, the guarantees of independence necessary for the assigned accident investigators.

International Activities

In the latter part of 2010 a boost was given to participation by the Directorate in international meetings organised by ERA (European Railway Agency). Relations with the European Commission were strengthened.

The need became clear to establish bilateral communication channels with other national investigation bodies, especially those of neighbouring countries and in particular Switzerland's investigative body.

The action plan put in place in 2010 for the year 2011 provides for the participation of the Directorate General in almost all of the international meetings, with an operating division for participation in working groups covering topics of specific interest of the two divisions, but in a context of internal synergy.

The action of the Directorate General envisages a general renewal of its international role, particularly with a more proactive approach to presenting proposals.

Preparation therefore began for the bilateral meetings planned for the first weeks of 2011 with the ERA and the European Commission.

Activities related to exchanging information with the European Commission about the progress of the Viareggio railway incident investigation

On July 14, 2010, the European Commission sent a request for information to the Operational Structure for Infringement Proceedings (Department for Coordination of EU Policies), regarding the alleged non-implementation by Italy of the Railway Safety Directive (Directive 2004/49/EC) in relation to the conduct of investigations following the accident in Viareggio.

The Commission had requested Italy to provide explanations on the lack of collaboration between the Investigation Body provided for by Directive 2004/49/EC (this Directorate General)

and the authorities responsible for the judicial inquiry into the railway accident in Viareggio, which occurred in 29 June 2009, with the consequent extension of the time taken to complete the activities of said Investigative Body.

The response of the Directorate General in September 2010 necessarily drew attention to the provisions of Legislative Decree 162 of 2007 implementing the above-mentioned Directive: the wording of the regulatory Legislative Decree 162 subordinates the activity of the ministerial investigative body to the "express authorisation of the judicial authority where the investigative activity is carried out following the occurrence of an offence."

The exchange of information revealed discrepancy in terms of operation and application, if not also in law, between the Italian and EU regulations in question, which had already been noted. Community regulations in fact provide for a regime of joint cooperation between the authority responsible for the judicial inquiry and the Investigative Body, a collaboration which currently proves incompatible with the Italian law, with the Code of Criminal Procedure and with judicial practice.

A number of actions have been taken during the last weeks of December aimed at preventing, in the immediate short-term, the commencement of infringement proceedings for breach of the obligations imposed by the EU Directive 2004/49/EC and, above all, to establish a correct modus operandi in the medium term, and potentially to initiate a whole process of regulatory review. These actions include:

- A participation request sent to the Public Prosecutor's Office of Lucca by the Ministerial Commission of Inquiry regarding the accident in the destructive testing of sequestered materials, having been informed of this likely procedural step;
- A request to the Ministerial Commission appointed on 30 June 2009 to conclude its activities on the basis of information/data gathered and/or revealed to date, without prejudice to the said Commission being entrusted with a supplementary investigation as soon as the materials sequestered by the Lucca Public Prosecutor's Office should become available*
- A request sent to the Legislative Office of the Ministry of Infrastructure and Transport to assess the opportunity of convening a round table with the competent bodies of the Ministry of Justice to facilitate long-term action to resolve, especially on the operational level, the apparent discrepancy between Italian and EU regulations;
- The commencement of immediate contacts with the Operational Structures for infringement proceedings (Department for Coordination of EU Policies) in order to

*Note: At the date of drafting of this report, the Ministerial Commission is actively collaborating with the judiciary, having been admitted to the special evidentiary hearing

prepare a common policy on the threatened infringement proceedings and organise a meeting in Brussels, to be held in January 2011, with competent officials of the European Commission (Directorate General of Transport - DG MOVE).

With reference to the matter described above, it should be noted that, at the date of compilation of this Report, best practice involves the preparation by this Office of a draft amendment of Article 21 of Legislative Decree 162/2007 for purposes of enabling optimal collaboration between the judicial authorities and investigative bodies, in reference to the work of the former but at the same time granting the latter greater consultative powers with the said judicial authorities.

This draft amendment was duly prepared by the Legislative Office of our Ministry with the active and participatory collaboration of the Legislative Office of the Ministry of Justice, to ensure it would take a shared form and achieve, with minimal difficulties of interpretation, an optimal marriage between the wording of the original European Directive and Legislative Decree 162/2007 which implemented it.

To our knowledge the amendment, which incorporates the convergent positive opinion of the Legislative Offices of the two ministries involved, is likely to be accepted, subject naturally to prior parliamentary scrutiny, in the next EU Law.

Recommendations

Pursuant to Legislative Decree 162/2007, the General Directorate, on the basis of the causes identified, sets out the recommendations and transmits them to the interested parties (the ANSF, the Infrastructure Operator, etc.) and to the European Railway Agency.

Following the investigations completed in 2010, the Investigative Body issued a number of recommendations to those responsible for safety.

An overview of these recommendations is provided in *Table 3*.

Table 3 - Recommendations issued by the Directorate General

Event		Date of issue	Recipient		Recommendation
Anagni, 24/01/2009	Splitting of the Eurostar ES 9456 train	18/06/2010	ANSF	1.	The 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 the stress levels on the tow bars of the ETR 500.
			ANSF	2.	The need to record the pressure flow in the main pipe, in particular with regards the head and tail locomotives.
			ANSF	3.	The need to check coupling dimensioning on the basis of a scrupulous evaluation of the actual maximum stresses.
			ANSF	4.	The need to replace any couplings about which there are doubts with regard to their dimensioning.
			ANSF	5.	The review of guidelines regarding the lead sealing on the emergency brake handles.
			ANSF	6.	The need for a review of the procedures for recording the condition of rolling stock and the position of control devices following a railway accident or incident
Motta S. Anastasia, 01/09/2008	Fatal collision with two workers at switch point No 2, situated at kilometre 223+132 of the Palermo - Caltanissetta – Catania railway line	23/07/2010	ANSF	1.	To initiate and complete a process of modification of rules governing the protection of railway worksites by providing for the general adoption of the track interruption regime, to preferably be implemented in conjunction with timetable intervals.
			ANSF	2.	Where in special cases it proves necessary to apply the rules for clearance of tracks on sight, measures need to be introduced to enhance their safety and to investigate issues relating mainly: - to the progress of the works in the station (moreover, there are currently many stations without a Traffic Controller, an issue to be considered by IPC [*Worksite Protection Instruction*]); - to the minimum number of persons that should be exclusively assigned to worksite protection activities (a single person, for example, may be inadequate even in conditions of optimum visibility, where rail traffic exist in both directions on the track); - to the maximum number of persons that may be employed in the protection activity (a large number of lookouts risks over-complicating the worksite protection procedure and increasing the probability of human error; therefore, if a specific number of personnel is exceeded, the protection on sight system should not be used); - to define the safe time period (e.g. enabling discretion in the definition of safety zone and as a result the definition of the minimum safety time); - to the advisability of providing automatic warning and protection equipment at the worksite; - to the effectiveness of personnel training activities; - to the possibility of planning activities and areas of intervention of the work teams, so as to be able to force the slowing down of trains in transit over those stretches of line.

Conclusions

The analysis in this Annual Report for 2010 and the quantifications detailed so far reveal a substantially positive railway accident scenario (1) but with a number of contradictions present (2) which form the basis for serious reflection also to enable the DGIF to draft its response for the years following 2010.

(1) The serious consequences of railway accidents in the strict sense, understood as incidents based on collisions, derailments or incidents associated with rail traffic alone - characterised moreover by injuries to "railway users" and to "railway operators", appear to be gradually declining.
This reduction may certainly be attributed to a series of factors and virtuous behaviour adopted generally within the framework of special protection of rail traffic safety by the national infrastructure operator, the Italian Railway Network (RFI) and the railway undertakings and, in parallel, within the policy framework adopted by the Italian National Safety Authority since its establishment.
In Italy there is currently a residual category of what may be defined here as "typical" accidents, in which a complex statistical combination of direct causes and situational factors – also of an environmental nature associated with the structure of the country – generates a limited if fluctuating number of "accidental occurrences" which are difficult to predict and highly variable in their nature.
This residual accident category is difficult to eliminate, as indeed is the case in other EU countries, precisely because of the specificity referred to above.
This particular situation is to be regarded as a physiological phenomenon for technically advanced countries like Italy, which already have a railway system that is technologically highly advanced and is, in general, well-managed especially in terms of processes.
There is room, however, for improvement in terms of prevention of these accidental occurrences especially in relation to the situational or geographic factors within which these events occur (the hydrogeological structure); however, such improvement actions would involve very high marginal costs in order to completely eliminate this category of residual accidents.

(2) On the other hand, accidents and incidents involving users who are not railway users (pedestrians, cyclists, road users, persons occasionally on the railway line inappropriately or involuntarily) continue to persist.
Collisions with persons on the railway line are in fact not negligible in number (174 fatal collisions and 59 non-fatal collisions in 2010), and the phenomenon will ensure that the Directorate General will continue its research into this situation which has already commenced in the preceding years, which will also provide for close interaction with the agencies and authorities involved.
The accident at Viareggio falls into a grey area between the two categories described above: an

accident which occurred within the railway transport system due to direct causes typical to railway incidents (derailment), whose very serious consequences spread to a populated zone outside the railway precinct, tragically involving people who at that time were completely outside the railway transport system.