Instituto Nacional do Transporte Ferroviário

DEPARTAMENTO DE INVESTIGAÇÃO DE ACIDENTES
[Accident Investigation Department]

ANNUAL REPORT 2006

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A – SUMMARY

This report seeks to ensure compliance with Article 23(3) of Directive 2004/49/EC of 29 April, which stipulates that each year the body responsible for investigating accidents shall publish by 30 September a report accounting for the investigations carried out in the preceding year, the safety recommendations that were issued and actions taken in accordance with recommendations issued previously (2006).

In accordance with the above the main aspects of this report are the following:

- Presentation of current organisation
- Description of procedures
- Identification of type of investigations carried out in 2006
- Summary of investigations concluded
- Recommendations made

B – INTRODUCTION

In 2006 the procedures for investigating railway accidents and incidents were continued in accordance with methodology adopted in recent years.

Due to the shortage of human resources it was not possible to conclude investigations within the time limits laid down in the Directive (12 months after opening an investigation).

This may be connected to the fact that for each procedure an investigation board is appointed consisting of virtually the same three members each time, giving rise to an excess and overlapping workload that does not allow deadlines to be met.

All procedures relating to the collection and processing of technical data concerning the circumstances surrounding occurrences, however, both as regards rolling stock and infrastructure, were developed and put into practice.

Direct and indirect evidence was also collected and recorded in parallel with these procedures.

Although the Directive was not transposed in 2006, it was gradually implemented, particularly as regards criteria for opening investigations, the structure of reports, institutional relations and the provision of information to the ERA on occurrences giving rise to investigations.

It must also be pointed out that in the absence of a rail safety authority to which the recommendations made in final reports are to be addressed, the procedure adopted has been to send them to operators and to the infrastructure manager for them to give their opinion, and subsequently to include their comments or otherwise.

C – ORGANISATION

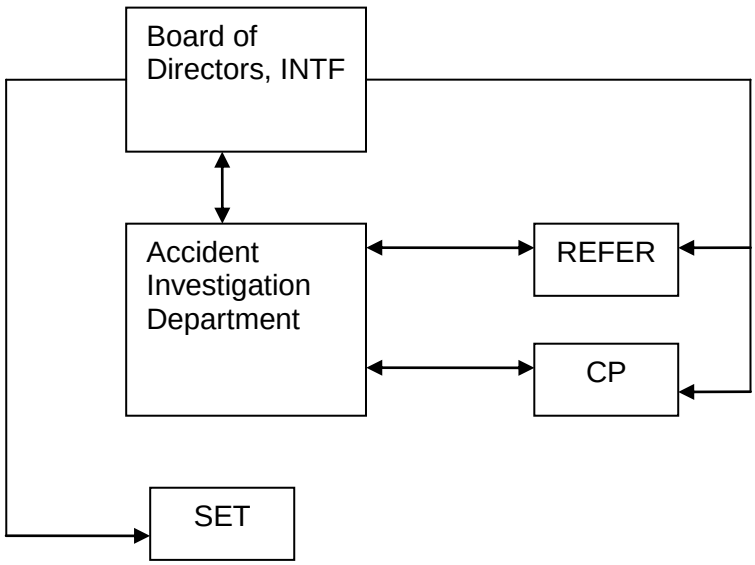
In 2006 the accident investigation services were part of a department reporting to the *Inspecção Ferroviária* [Railway Inspectorate].

During that time these services consisted of the following personnel:

1 – Department Manager
3 – Senior Technical Staff (two researchers and one legal specialist)
1 – Administrative Staff

These services form part of the structure of the INTF and report to the Board of Directors, though they remain functionally autonomous in terms of the proposed capacity to open and carry out investigations and to present conclusions and recommendations, which they have exclusive responsibility for.

Institutional relations with the services of the infrastructure manager (REFER) and with the rail transport operator (CP) are ensured directly through the chair and members of the investigation boards in terms of requests for all technical documentation necessary for carrying investigations out.



[SET = Secretary of State for Transport]

Figure 1 – Institutional Organisation Chart

D – PROCEDURES

The following procedures were adopted in investigating accidents in 2006:

1. Information on occurrences received from operators or from the infrastructure manager (written or verbal).
2. Decision on measures to be taken according to the seriousness of the occurrence (opening of an investigation or not).
3. Collection of preliminary information on the circumstances surrounding the occurrence (human and material damage, rail traffic safety, etc.).
4. Survey of the site of the occurrence with the infrastructure manager – description of the circumstances surrounding the occurrence, photographic record.
5. Procedures for opening an investigation – reasons for opening the investigation and proposal to form the investigation board, information on the decision and on forming the investigation board sent to the infrastructure manager, operators and the Secretary of State for Transport.
6. Identification and organisation of technical information to be requested from companies on rolling stock involved and infrastructure.
7. Scheduling of hearings involving the train crew and other witnesses.
8. Interviews.
9. Receipt and confirmation of technical data requested.
10. Identification of any additional information to be obtained from companies.
11. Drafting of the first version of the report on the occurrence, as laid down in Annex V of Directive 2004/49 of 29 April.
12. Examination and discussion of the first version of the report.
13. Introduction of changes and signature of the final report.
14. Forwarding of final report to companies for their response.
15. Analysis and validation of the observations made by companies on the final report.
16. Introduction of changes, if any, into the final report.

17. Forwarding of the final report to companies and to the Secretary of State for Transport.
18. Monitoring of recommendations.

E – INVESTIGATIONS

In 2006 a total of 17 investigations were opened and eight were concluded, four of the latter being opened in 2004, three in 2005 and one in 2006; 24 investigations were brought forward to 2007, relating to the years 2005 and 2006, and are now in progress.

Out of the 17 investigations opened in 2006, seven correspond to accidents at level crossings, four to derailments, three to collisions and three to various occurrences.

INCIDENT TYPE	v.a.	%
Derailments	4	24%
Level crossings	7	41%
Collisions	3	18%
Others	3	18%
Total	**17**	**100%**

Table 1 – Type of occurrences investigated (2006)

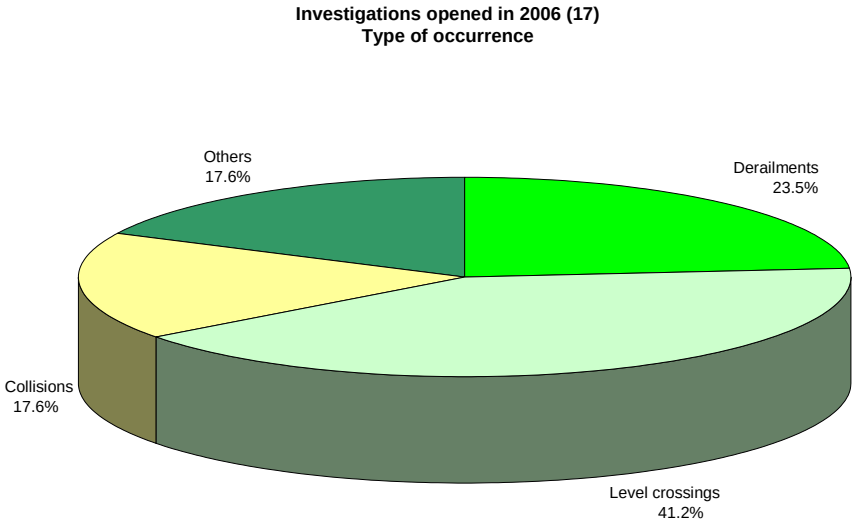


Figure 2 – Type of occurrences investigated (2006)

Table 2 identifies investigations opened in 2006 and their date and time.

Table 3 shows summaries of the eight investigations concluded in 2006.

Table 2 – Investigations begun in 2006

DESCRIPTION	DATE	TIME
Derailment of a wagon in goods train no 64311 at kp [kilometre point] 235.140, Northern Line, between Mealhada and Mogofores stations	20.12.2006	04h35
Accident involving train no 6454 at type B LC [level crossing], kp 175.976, Western Line	15.12.2006	12h02
Accident involving train no 60984 at 5th category LC, kp 37.969, Southern Line	27.11.2006	19h05
Derailment of train no 51330 at Oliveira do Bairro station, Northern Line	13.11.2006	21h55
Accident involving train no 25625 at type B LC, kp 62.542, Beira Baixa Line	07.11.2006	05h26
Accident involving train no 6457 at type C LC, kp 170.418, Western Line	28.10.2006	14h30
Incident involving goods train no 77351 at Tramagal station, kp 129.500, Beira Baixa Line	25.10.2006	05h35
Accident involving train no 4660, kp 329.600, Northern Line, between Gaia and Valadares	26.09.2006	19h13
Incident involving train no 66951 at kp 87.400, Northern Line, between V. Figueira and Mato de Miranda stations	06.09.2006	03h54
Accident involving train no 524 at type B LC, kp 323.850, Northern Line	10.08.2006	20h35
Derailment of goods train no 66590 at Pegões station, Alentejo Line	15.07.2006	18h27
Accident involving passenger train no 5705 at kp 387.300, Algarve Line	11.07.2006	10h17
Accident involving passenger train no 128, Northern Line, at the pedestrian crossing at Miramar halt	06.07.2006	11h25
Derailment of goods train no 50331 at Pampilhosa station, Northern Line	04.07.2006	21h50
Accident involving the Elevador da Bica [Lisbon funicular]	21.06.2006	20h50
Incident involving train no 3205 at type B LC, kp 100.762, Minho Line, between Âncora and Moledo do Minho	18.05.2006	16h12
Accident involving passenger train no 6472 at type B LC, kp 164.079, Western Line	18.03.2006	17h20

Table 3 – Summary of investigations concluded in 2006

DATE	PLACE	SUMMARY
Date of Accident/Incident: 06 September 2006 ***Report Date:*** 30 November 2006	Northern Line, kp 087.428, between Vale de Figueira and Mato Miranda	On 06 September 2006, train no 66951, consisting of 22 TEJO ENERGIA S.A. wagons loaded with coal, originating at Porto de Sines station and going to Pego power station, stopped at around 03H50 near kp 087.428 on the Northern Line, between Vale de Figueira and Mato Miranda stations, due to a fault in an axle box bearing on the seventh wagon from the front of the train.
Date of Accident/Incident: 29 June 2005 ***Report Date:*** 01 February 2006	Western Line at type B LC, kp 174.019	On 29 June 2005 at around 19H15, a Fiat Punto passenger vehicle, registration number 86-00-GX, was hit by passenger train no 6463 at a type B automatic level crossing at kp 174.019, between Monte Real station and Monte Redondo halt on the Western Line.
Date of Accident/Incident: 20 June 2005 ***Report Date:*** 09 June 2006	Northern Line, bridge at Arzila, kp 204.792	On 20 June 2005 at around 08H30, passenger train no 16805, originating at Figueira da Foz station and going to Coimbra-Cidade, hit and killed two METALOVERA employees who were erecting metal supports at the bridge at Arzila, kp 204.792, between Pereira and Amial halts on the Northern Line.
Date of Accident/Incident: 29 September 2005 ***Report Date:*** 07 August 2006	Eastern Line at type D LC, kp 149.697	On 29 September 2005 at around 10H05, a black OPEL Astra passenger vehicle, registration number 07-37-SZ, was involved in a collision with passenger train no 5501 at a type D level crossing at kp 149.697, between Bemposta and Ponte de Sôr stations on the Eastern Line.
Date of Accident/Incident: 17 December 2004 ***Report Date:*** 12 September 2006	Minho Line, signal S19 at Contumil station passed at danger	On 17 December 2004 at around 06H54, suburban passenger train no 15151, coming from Porto-S. Bento and going to Guimarães, passed at danger main exit signal S19 at Contumil station on the Minho Line, coming to a halt after the first two wagons of the train went over points 8, forcing them open because they were in the reverse position.
Date of Accident/Incident: 08 November 2004 ***Report Date:*** 02 February 2006	Cascais Line at the Parque do Areal, Alcântara-Mar Station	At around 10H31 on 8 November 2004, a break occurred in rolling stock consisting of ten loaded container wagons pulled by Locomotive 1461, shunting between Alcântara-Terra and the LISCONT branch line in Alcântara-Mar, two wagons being partially derailed as the train was entering the Parque do Areal on Line I.
Date of Accident/Incident: 21 September 2004 ***Report Date:*** 9 April 2006	Minho Line, Nine station	On 21 September 2004 at around 15H25, passenger train no 15223, originating at Porto-S. Bento station and going to Braga, passed at danger signal S1 at the entrance to NINE station, the front bogie on the first coach from the front of the train being derailed when it went over points 1/II, which were in the reverse position, forcing them open.
Date of	Southern	On 9 June 2004 at around 11H40, the 15th wagon from the

Table 3 – Summary of investigations concluded in 2006

DATE	PLACE	SUMMARY
Accident/Incident: 09 June 2004. ***Report Date:*** 26 May 2006	Line, kp 108.780, between Canal-Caveira and Grândola stations	front of train no 66852, consisting of 22 Tejo Energia wagons loaded with coal, originating at Porto de Sines station and going to Pego power station, derailed near kp 108.780, between Canal Caveira and Grândola stations on the Southern Line.

F – RECOMMENDATIONS

Of the 27 Recommendations made in investigations concluded in 2006, 13 were addressed to the rail infrastructure manager (REFER), seven to the railway operator (CP) and seven to other organisations. (Figure 3)

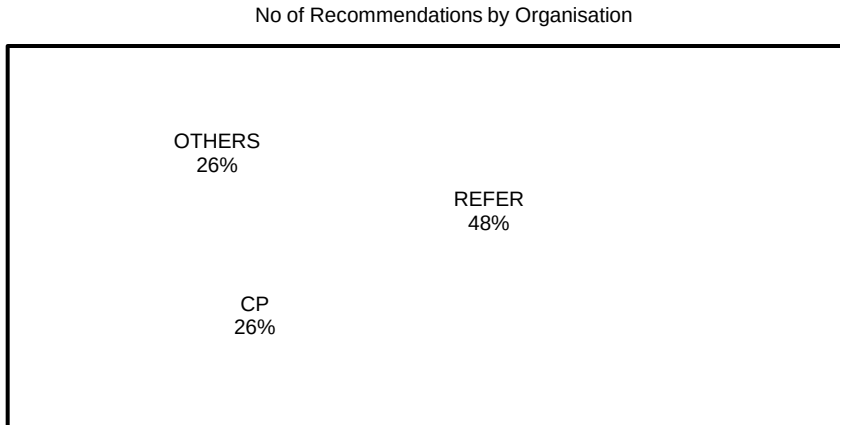


Figure 3 – Recommendations by organisation

Particularly important by type of recommendation are those connected to the training of personnel and to infrastructure, and those connected to the alteration or installation of equipment, compliance with regulations or legislation and rolling stock maintenance. (Table 4 and Figure 4)

Category of Recommendation	No	%
Personnel training	9	33%
Alteration or installation of equipment	4	15%
Compliance with regulations or legislation	4	15%
Rolling stock maintenance	4	15%
Monitoring	3	11%
Organisation of services	1	4%
Studies	2	7%
Total	**27**	**100%**

Table 4 – Category of Recommendation (2006)

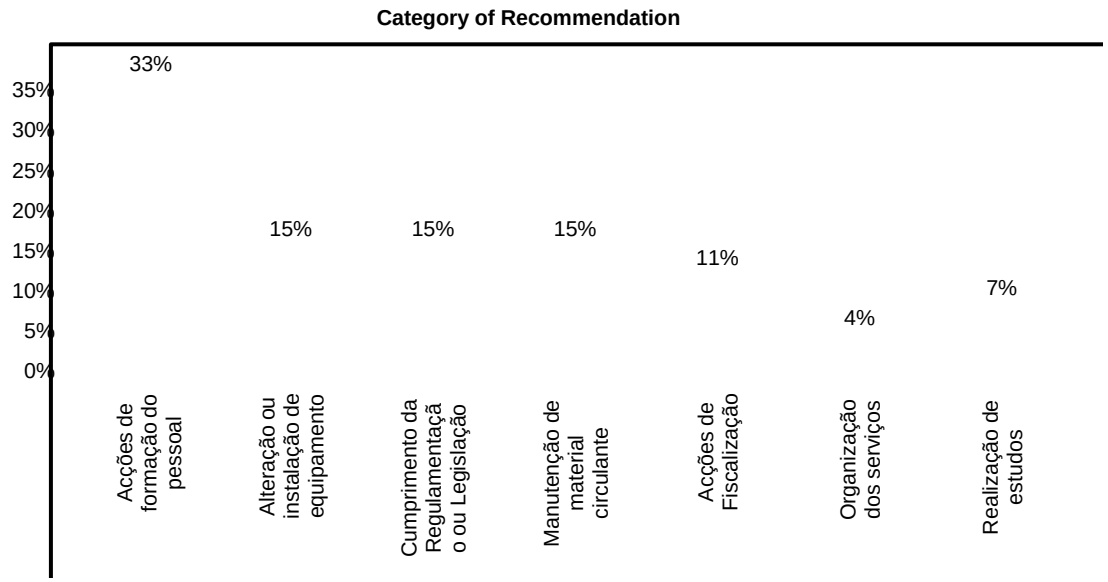


Figure 4 – Category of Recommendation (2006)

[Key: as per Table 4 above]

Table 5 shows recommendations made in connection with investigations concluded in 2006.

Table 5 – Recommendations made in investigations concluded in 2006

OCCURRENCE	**Incident involving Tejo Energia ore wagon 83 94 933 0 037-1, goods train no 66951, at kp 087.428, Northern Line, between Vale de Figueira and Mato Miranda stations, 06 September 2006**
REPORT DATE	**30 November 2006**
N.º	**RECOMMENDATIONS**
1	REFER should promote training and simulations for personnel involved in resolving disturbance to train movements, particularly in situations analogous to the one concerned, so as to improve processes and practices and to identify the need for corrective action, if any, particularly in emergency plans.
2	REFER should install track-side hot axle box and wheel detection equipment in the most appropriate places.
3	In cases of this type, CP, train crews and other parties involved in monitoring traffic should assess the situation soundly, complying strictly with procedures laid down in the safety regulations, particularly those in emergency plans.
4	CP should promote training and simulations for train crews and other rail traffic monitoring personnel in connection with procedures to be adopted in emergencies.
5	TEJO-ENERGIA, S.A. should ensure that the maintenance service provider METALSINES promotes effective supervision of the quality of services carried out and materials used, and reappraises the adequacy of maintenance work carried out on equipment relevant to rail traffic safety, particularly wagon axle components.
6	TEJO-ENERGIA, S.A. should study the need or otherwise to include replacement of the lubricating device and checking of axle box bearings in other inspections/action, in addition to RSP [First Programmed Safety Inspection] and RP [Programmed Repair].

OCCURRENCE	**Accident involving train no 6463 at type B LC, kp 174.019, Western Line, 29 June 2005**
REPORT DATE	**01 February 2006**
N.º	**RECOMMENDATIONS**
1	Bearing in mind that according to its description sheet the 2004 traffic moment of this LC is estimated at 43 809, REFER should propose its reclassification in accordance with Article 9(2) of Chapter II of the *Regulamento de Passagens de Nível* (RPN)[Level Crossing Regulations], approved by Decree Law no 568/99 of 23 December.

OCCURRENCE	**Accident involving train no 16805 at the bridge at Arzila, kp 204.792, Northern line, 20 July 2005**
REPORT DATE	**09 June 2006**
N.º	**RECOMMENDATIONS**
1	As rail infrastructure manager, REFER should systematically and continuously improve its monitoring of work carried out on the rail network, ensuring in particular that implementing bodies comply with the regulations laid down in IET [*Instrução de Exploração Técnica* – operating instruction] no 77.
2	As contractor and supervisory authority for this type of work, REFER TELECOM

	should develop monitoring with contractors to ensure compliance with the project health and safety plan and the regulations laid down in IET no 77.
3	CP train crews, particularly drivers, should use the means available to them to communicate the occurrences they observe on the railway, particularly those encroaching on the 'safety zone', which they have not been informed of and which are not signalled.
4	The subcontractor METALOVERA should monitor and supervise its workers to ensure that they comply with the most stringent safety rules provided for in the railway regulatory framework, particularly the regulations laid down in IET no 77.
5	The subcontractor PAINHAS S.A. should promote and highlight the training necessary for its workers and management to fully assimilate the safety requirements that must be observed in carrying out track-side work, particularly as regards encroaching on the 'safety zone'; it should for that purpose appoint an operative who has undergone safety training to act exclusively as watchman, and should ensure that such operatives are certified by the infrastructure manager, as laid down in IET no 77.

OCCURRENCE	**Accident involving passenger train no 5501 at type D LC, kp 149.697, Eastern Line, 29 September 2005, at around 10h05**
REPORT DATE	**07 August 2006**
No	**RECOMMENDATIONS**
1	As rail infrastructure manager, REFER should ensure that Abrantes Town Council examines the current LC vertical road signs with a view to installing advanced road signs at the approach to the LC concerned.
2	REFER should place signs indicating a sound warning at the regulatory distance from the LC, one in each direction, in accordance with point 32 of Chapter 4 of the *Regulamento Geral de Segurança II – Sinais* [General Safety Regulations II – Signals].
3	REFER should review its timetabling in light of the frequency at which undergrowth near LCs is cut and thinned, thereby complying with Article 8(9) of Chapter 1 of the Level Crossing Regulations, approved by Decree Law no 568/99 of 23 December.

OCCURRENCE	**Derailment of Tejo Energia ore wagon no 83 94 933 0 063-7 in goods train no 66852, kp 108.780, Southern Line, between Canal-Caveira and Grândola stations, 9 June 2004.**
REPORT DATE	**26 May 2006**
No	**RECOMMENDATIONS**
1	REFER should promote a study with a view to installing a hot axle bearing and wheel detection system on sections of track with heavier goods traffic.
2	CP operatives involved in making up and breaking down trains should ensure rigorous visual examination of safety controls and equipment, not allowing wagons belonging to third parties for which traction is provided to operate if they are not fit for purpose.
3	In analogous cases CP should in due time extract data from the CONVEL system recording unit or from the traction unit recording tape in order to draw up the respective report.
4	In cases of this type EMEF E.P. should assess the situation more soundly so as to improve response capacity in providing rescue trains, particularly as regards the resources and equipment to be used in rescue operations.
5	TEJO-ENERGIA should ensure that the maintenance services provider, currently METALSINES, promotes more effective traceability of equipment relevant to rail traffic safety, particularly wagon axle components.
6	TEJO-ENERGIA S.A. should study, where deemed appropriate, the need or otherwise to include replacement of the lubricating device and checking of

	axle box bearings in other inspections/action, in addition to RSP and RP.

OCCURRENCE	**Derailment of passenger train no 15223 at Nine station, Minho Line, 21 September 2004.**
REPORT DATE	**13 April 2006**
N.º	**RECOMMENDATIONS**
1	REFER should install the CONVEL system on the Minho Line, particularly on sections of track that have been renewed.
2	CP should improve its train crew training, raising awareness of the need for strict compliance with current rail traffic rules and improving monitoring to ensure strict compliance with such rules.

OCCURRENCE	**Derailment of two wagons in the Parque do Areal, Alcântara-Mar station, Cascais Line, 8 November 2004**
REPORT DATE	**2 February 2006**
N.º	**RECOMMENDATIONS**
1	REFER should improve personnel training, particularly for operatives directly involved in operating switches and crossings, raising awareness of the need for strict compliance with current regulatory standards, accompanied by monitoring.
2	As rail infrastructure manager, REFER should ensure that Lisbon City Council carries out technical feasibility studies with a view to equipping the road-rail crossings on Rua Prior do Crato and Av. 24 de Julho with integrated traffic light signalling so that when rolling stock is in motion the road traffic lights are at red, as currently occurs at the road-rail crossings on Av. da Índia and Av. de Brasília.
3	To improve safety conditions in shunting operations on entry to and exit from the Parque do Areal, where deemed advantageous REFER should carry out studies with a view to powering switch 9, or other studies pursuing the same objectives.

OCCURRENCE	**Incident involving train 15151 at Contumil station, Minho Line, due to signal s19 being passed at danger, 17 December 2004**
REPORT DATE	**12 September 2006**
N.º	**RECOMMENDATIONS**
1	CP should improve its train crew training, raising awareness of the need for strict compliance with current regulatory standards and improving monitoring to ensure strict compliance with rail traffic rules.

G – CONCLUSIONS

The following are the principal conclusions drawn from activities carried out in 2006, difficulties encountered and the outlook for 2007:

- In 2006, 17 investigations were opened, involving the collection and processing of technical information relating to each investigation and the drafting of technical reports on priority cases.
- The shortage of technical personnel did not allow investigations to be completed within the time limit laid down by the Directive (one year after opening an investigation). It was, however, possible to complete all investigations originating in 2004 (four), three in 2005 and one in 2006.
- The delay in completing investigations was the most serious problem facing the department, although priority was given as far as possible to those involving human injury or great complexity.
- The institutional changes arising out of the transposition of Directive 2004/49/EC of 29 April, with the creation of the *Gabinete de Investigação de Segurança e de Acidentes Ferroviários* (GISAF) [Rail safety and Accident Investigation Bureau], will help to make it possible to comply with the Directive.
- As regards contacts with the European Railway Agency (ERA), participation was ensured in accident investigation meetings in Lille in 2006, facilitating the exchange of experiences and improving technical know-how.

ANNEX 1 – Investigations brought forward to 2007

DESCRIPTION	DATE	TIME
Derailment of a wagon in train no 64311 at kp 235.140, Northern Line, between Mealhada e Mogofores	20.12.2006	04h35
Accident involving train no 6454 at type B LC, kp 175.976, Western Line	15.12.2006	12h02
Accident involving train no 60984 at 5th category LC, kp 37.969, Southern Line	27.11.2006	19h05
Derailment of train no 51330 at Oliveira do Bairro station, Northern Line	13.11.2006	21h55
Accident involving train no 25625 at type B LC, kp 62.542, Beira Baixa Line	07.11.2006	05h26
Accident involving train no 6457 at type C LC, kp 170.418, Western Line	28.10.2006	14h30
Incident involving goods train no 77351 at Tramagal station, kp 129.500, Beira Baixa Line	25.10.2006	05h35
Accident involving train no 4660 at kp 329.600, Northern Line, between Gaia and Valadares	26.09.2006	19h13
Accident involving train no 524 at type B LC, kp 323.850, Northern Line	10.08.2006	20h35
Derailment of goods train no 66590 at Pegões station, Alentejo Line	15.07.2006	18h27
Accident involving passenger train no 5705 at kp 387.300, Algarve Line	11.07.2006	10h17
Accident involving passenger train no 128 at the pedestrian crossing at Miramar halt, Northern Line	06.07.2006	11h25
Derailment of goods train no 50331 at Pampilhosa station, Northern Line	04.07.2006	21h50
Incident involving train no 3205 at type B LC, kp 100.762, Minho Line, between Âncora and Moledo do Minho	18.05.2006	16h12
Accident involving passenger train no 6472 at type B LC, kp 164.079, Western Line	18.03.2006	17h20
Derailment of train no 75436 at Vila Franca das Naves station, Beira Alta Line	22.11.2005	16h52
Incident involving passenger train no 423 at	07.11.2005	21h09

DESCRIPTION	DATE	TIME
Caminha station, Minho Line		
Incident involving locomotives nos 2506 and 2551 at Pampilhosa station, Northern Line	10.11.2005	10h27
Accident at Bexiga beach pedestrian crossing involving a 'Transpraia Lda' train, Costa da Caparica Line	11.08.2005	15h00
Leak of material at Barquinha station and subsequent derailment at kp 108.550, Beira Baixa Line	16.08.2005	19h45
Accident at type B LC, kp 24.988, Western Line, involving train no 68361	03.06.2005	06h45
Accident at type B LC, kp 144.042, Beira Alta Line, involving train no 5413	20.05.2005	20h34
Accident involving passenger train no 3108 at type A LC, kp 77.436, Minho Line	24.04.2005	13h15
Accident at type D LC, kp 9.658, Vogue Line, involving train no 5105	01.03.2005	11h26
Accident at type D LC, kp 207.273, Beira Alta Line, involving train no 5427	14.01.2005	16h45