

**REPORT BY THE CHANNEL TUNNEL
INTERGOVERNMENTAL COMMISSION
ON SAFETY IN THE CHANNEL TUNNEL
FIXED LINK DURING 2008**

Contents

	Paragraphs
A Scope of the report	1 - 2
B Introductory Section	3 – 8
C Organisation	9 – 12
D The Development of Railway Safety	13 – 18
E Important Changes in Legislation and Regulation	19 – 25
F The Development of Safety Certification and Authorisation	26 – 28
G Supervision of Railway Undertakings and Infrastructure Managers	29 – 37
H Conclusions	38 - 40
I Sources of Information	41
J Annexes	
Annex A: Railway Structure Information	
Annex B: IGC Structure and Relationships	
Annex C: Data on Common Safety Indicators	
Annex C1: Safety related incidents included in reports previously published by the CTSA	

A - Scope of the report

1. This report contains information relating to the activities of the Channel Tunnel Intergovernmental Commission (IGC) in its role as the safety authority for the Channel Fixed Link (the Channel Tunnel) within the terms of the European Railway Safety Directive (2004/49/EC). The IGC's responsibilities extend only to the area of the Fixed Link as described in the Treaty of Canterbury between the United Kingdom and France and the Concession Agreement between the two Governments and the Concessionaires. This report covers the period from 1 January 2008 to 31 December 2008.

2. As this report was written in English the optional summary in that language has not been prepared. A French translation has been prepared and submitted to ERA together with the English document as it is the policy of the IGC to make all of its documents which are in the public domain available in both English and French. Readers of the French version who wish to consult the optional summary in English are invited to refer to the full English version which includes (para 7) an English language summary.

B - Introductory Section

3. **Introduction** - The Railway Safety Directive (2004/49/EC) makes provision for a binational body entrusted by Member States to ensure a unified safety regime for specialised cross-border infrastructures to take on the tasks of a “safety authority”. This provision has been applied in respect of the Channel Tunnel Fixed Link and the United Kingdom and France have agreed that the IGC should be the “safety authority”. This report is prepared in accordance with Article 18 of the Directive and, so far as possible, conforms to the template and guidance issued by the European Railway Agency (ERA) with a view to providing a common structure and content for such reports. It is submitted to the ERA as required by the Directive but its intended audience is anybody with an interest in the safety of the Fixed Link or similar infrastructures.

4. **Railway Structure Information** - The railway infrastructure of the Channel Tunnel comprises the twin bored tunnel rail link under the English Channel between Cheriton in Kent and Fréthun in the Pas-de-Calais, together with the terminal areas on either side. The terminal areas include the high speed lines linking the tunnel with the UK and French national networks; the loops and the platforms used for the loading and unloading of the tourist and HGV shuttle trains; and the yards and maintenance facilities and their associated links to the rest of the infrastructure.

5. **Infrastructure Manager** A network map and information about Eurotunnel, the infrastructure manager for the Channel Tunnel, is at **Annex A**.

6. **Railway Undertakings** - The railway undertakings which operated trains through the Channel Tunnel during the period covered by this report were English Welsh & Scottish International Limited (EWSI), English Welsh & Scottish Limited (EWS)¹, SNCF, Eurostar (UK) Ltd and Europorte 2. The address and websites for these companies is at Annex A.3. More detailed information about them appears in the annual reports of the French and UK safety authorities as appropriate.

7. **Summary** - Key events in 2008 were as follows:

- Completion of follow up action on the fire which occurred on a Eurotunnel freight shuttle in the north running tunnel on 21 August 2006 (see paragraphs 16 - 18);

¹ During 2007 Deutsche Bahn AG acquired the EWS Group of companies. During the period covered by this report the decision was taken to give the existing company English Welsh & Scottish Railway Limited (EWS) a new name – “DB Schenker Rail (UK) Limited” – with effect from 1 January 2009. This change of name will be reflected in the IGC’s Annual Report for 2009. English Welsh & Scottish International Limited (EWSI) has not changed its name.

- The incident involving a coach on a tourist shuttle which occurred on 4 April 2008 (see paragraph 13);
- The serious fire in running tunnel north which occurred on 11 September 2008 (see paragraph 13);
- Consideration of proposals in relation to Eurotunnel's fleet of HGV shuttle wagons (see paragraphs 13 and 24);
- Continuing action to consider the impact of European Directives and other European initiatives such as the TSIs in relation to the Channel Tunnel (see paragraphs 19 – 22 and 25).

8. General Trend Analysis - The IGC and the CTSA continued to monitor the impact of the organisational changes on safety management and performance. Many of the Common Safety Indicators reported on in detail at Annex C remain at zero and the charts show a consistent fall overall in the precursors. Nevertheless, system safety performance (both collective and individual) was significantly effected by the fire which occurred on 11 September 2008. Until that time the trends had shown progressive improvement but the fire meant that the target frequency rates for both types of incidents was not achieved. Occupational safety performance for Eurotunnel staff showed an improvement during 2008 by comparison with 2007. Nevertheless, safety performance for contractors deteriorated with a significant increase in lost time accidents. (More detailed information about trend analysis appears at paragraph 14)

C - Organisation

9. The IGC was established by the Treaty of Canterbury to supervise, in the name and on behalf of the Governments of the UK and the French Republic, all matters concerning the construction and operation of the Channel Tunnel. The functions of the IGC include drawing up, or participating in the preparation of, regulations applicable to the Channel Tunnel. Each Government appoints half the members of the IGC which comprises a maximum of 16 members including at least two representatives of the Channel Tunnel Safety Authority (CTSA) – see paragraph 10 below.

10. The Treaty of Canterbury also established the CTSA to advise and assist the IGC on all matters concerning safety in the construction and operation of the Channel Tunnel. The functions of the CTSA also include ensuring that the safety measures and practices applicable to the Fixed Link comply with the national and international laws in force; enforcing such laws and monitoring their implementation; and examining reports concerning incidents affecting safety, making investigations and reporting to the IGC. The composition of the CTSA is determined by the two Governments by agreement and each Government appoints half of its members.

11. UK and French Secretariats arrange for the preparation and execution of the IGC and the CTSA's decisions.

12. Charts showing the structure of the IGC and its relationships with other bodies are at Annexes B.1 and B.2 respectively.

D - The Development of Railway Safety

D1 – Initiatives to maintain/improve safety performance

Table D.1.1 - Safety measures triggered by accidents/precursors to these

Accidents/precursors which triggered the measure			Safety measure decided
Date	Place	Description of the event	
4/4/08	UK Terminal	Uncontrolled movement of a coach onboard a tourist shuttle train	<p>The UK Rail Accident Investigation Branch (RAIB) decided to carry out an investigation into this incident. At the end of the year covered by this report the investigation report was awaited.</p> <p>Further information about this incident appears under paragraph 13 below.</p>
11/9/08	Running Tunnel North	Fire on an HGV shuttle train	<p>The French Bureau d'Enquetes sur les Accidents de Transport Terrestre (BEA-TT) and the RAIB decided to carry out an investigation into this incident. At the end of the year covered by this report the investigation report was awaited.</p> <p>In view of the seriousness of this incident, the IGC asked the CTSA to review the risk of fire in the Channel Tunnel and the action required to mitigate the risk. At the end of the year covered by this report the CTSA's review was ongoing.</p> <p>Further information about the fire appears under paragraph 13 below.</p>

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Table D.1.2 - Safety measures with other triggers

Where appropriate triggers for initiatives undertaken in 2008 are described in the text at paragraph 13 below. This table in the ERA template has not therefore been completed.

Safety measure decided	Description of the trigger of the measures

13. Activities and initiatives undertaken during the course of 2008 were as follows:

- Fire Onboard an HGV Shuttle train in Running Tunnel North on 11 September 2008** – The final months of the year were dominated by the fire which occurred on 11 September 2008. The fire occurred onboard an HGV shuttle train travelling from the UK to France. It is evident that one of the lorries on the shuttle caught fire although the reason for this remains unknown at the time of writing this report. The train had proceeded for over 30 km through the tunnel before the first alarm occurred at 15h54. The train made a controlled stop at 15h57 and a somewhat disorderly evacuation of the drivers from the club car into the service tunnel ensued. The fire was fought from 17h15 onwards and was finally extinguished at 13h08 the following day.

In the immediate aftermath of the fire attention was focused on the recovery from the incident and the repair of the damaged section of the tunnel. The tunnel was completely closed for two days. Services were restored progressively, initially just through running tunnel south and subsequently through the two undamaged intervals of running tunnel north (firstly between the UK portal and the crossover on the UK side, and then between the two crossovers). The damage caused by the fire was extensive. Two kilometers of running tunnel north required some repair work and re-equipment. Seven hundred metres required complete repair or restoration. At the end of the period covered by this report the section of the tunnel where the damage occurred (situated between the cross-over on the French side and the French portal) remained closed. [The tunnel was fully re-opened on 9 February 2009.] The CTSA worked closely with Eurotunnel with the objective of ensuring that the original standards for the integrity of the tunnel were maintained in respect of the repaired section, and that those responsible for the major civil engineering project involved in the

repairs paid adequate attention to the health and safety of those undertaking the work.

Although the fire led to no deaths and only relatively minor injuries, it was recognised that this was a serious accident that required full investigation. A formal investigation into the fire was therefore launched by the French Bureau d'Enquetes sur les Accidents de Transport Terrestre (BEA-TT) assisted by the UK Rail Accident Investigation Branch (RAIB). At the end of the period covered by this report the formal investigation report was awaited.

In the meantime, as the incidence of serious fires had been materially greater than had been assumed in the risk assessments conducted at the start of operations through the tunnel, the IGC asked Eurotunnel to undertake a serious study to revise its initial assessment of risks in the tunnel and asked the CTSA to consider whether the empirical evidence of increased risk required changes to the safety regime applying to the tunnel. While recognising that the full circumstances of the fire and the detailed operational implications were matters for the BEA-TT and RAIB investigations, the CTSA commenced urgent discussions with Eurotunnel about the wider implications of the incident and the immediate actions required. At the end of the period covered by this report the CTSA's review was ongoing.

- **Uncontrolled Movement of a Coach Onboard a Tourist Shuttle Train** – On 4 April 2008 there was an operational incident involving the uncontrolled movement of a coach in a passenger shuttle wagon. The coach rolled backwards towards the fire barrier doors of the wagons when the train began its journey towards leading to crush injuries being sustained by the coach driver when he attempted to arrest its movement. When the train came to a controlled stop the coach rolled forward leading to damage to the private car parked in front of it. There were no other injuries although the position of passengers behind the coach immediately before it rolled backwards gave rise to potential for injury. At the end of 2008 the report of the RAIB investigation into this incident was awaited.
- **Fires Onboard Eurostars** – In October 2008 there were two incidents involving fires breaking out onboard Eurostars while transiting the Fixed Link. Both fires involved paper which had accumulated in a void in the toilets. As an immediate response to the incidents additional periodic cleaning of the void was introduced and the 1KW electrical heater located in the void was isolated. In the longer term a design modification was introduced by installing an additional blanking plate to prevent combustible materials from entering the void.
- **Modification of the Arbel Freight Wagons (Eurotunnel HGV shuttles)** – Towards the end of 2006 Eurotunnel had informed the

IGC of problems posed by the cracking of the superstructures on its fleet of Arbel freight wagons. As originally designed the superstructure of each of these wagons consists of a row of four “pagoda-style” structures. During 2007 Eurotunnel submitted proposals to the IGC to remove two of the four pagodas from the 40 wagons which were in the most deteriorated condition. The IGC delegated to the CTSA the responsibility for authorising suitable trials to determine whether the proposed modification was acceptable. At the beginning of 2008, following a report from the CTSA, the IGC authorised the retention in service of those wagons which had been converted as part of the trial and also authorised Eurotunnel to modify additional wagons which, if left as they were, might deteriorate such as to pose serious safety risks. The IGC reminded Eurotunnel that the modification could only be considered to be an interim solution to the problem presented by the pagodas on Arbel wagons and that a more permanent solution should be sought. In November 2008 Eurotunnel submitted to the CTSA a detailed report on the operation of the 105 Arbel wagons which had been modified by that time.

- **Crisis Management** - A number of incidents in recent years in which trains have been stuck in the tunnel for several hours led to concerns about the adequacy of Eurotunnel’s arrangements for crisis management and the efficiency of its procedures for assisting customers caught up in this type of event. In May 2008 Eurotunnel sent to the CTSA the crisis management manual which it had drawn up in response to these concerns. The manual was reviewed in depth by the CTSA’s experts and the CTSA wrote to Eurotunnel with its detailed comments in respect of both rescue and public safety issues and human factors. The CTSA invited Eurotunnel to take its comments into account in the course of the further development and evolution of its manual. The 2009 IGC report will address the similar incident which occurred on 25 August 2008.
- **Tactical Radio** – During 2007, following consideration of Eurotunnel’s technical specification document, the CTSA advised Eurotunnel that its project to replace its existing analogue tactical radio system with a digital system could proceed subject to it being monitored by the CTSA’s experts in close liaison with the emergency response organisations in the UK and France who are the principal users of the equipment. During the course of 2008 the new equipment was ordered by Eurotunnel and training in its use was commenced. At the end of the period covered by this report the final commissioning and introduction into operation of the new system was awaited.
- **Operation TAPIS III** - During the course of the year Eurotunnel continued its lengthy programme of work to remedy defects

resulting from the deterioration of the upper track bed concrete at its interface with the sleeper blocks. As in previous years the CTSA continued to take a keen interest in this work both in relation to the effectiveness of the repairs and the risks to the health and safety of those undertaking the work. The TAPIS III operations are due to be completed 2009.

- **Refrigeration Units** – At the beginning of the year Eurotunnel submitted to the CTSA the outcome of a study it had conducted of its procedures for managing a situation where an HGV refrigeration unit is left on onboard an HGV shuttle during transit. Eurotunnel concluded that the existing arrangements whereby the train was stopped, even if already in tunnel, so that the driver of the HGV in question can switch the unit off not only caused disruption to services but also increased risks because of need to detrain the drivers of the HGV vehicles concerned, who are unfamiliar with the risks associated with the tunnel environment, so that they can be taken to their vehicles to turn off the units. Eurotunnel therefore proposed that trains should continue their journeys through the tunnel but that they should be specifically monitored by the Rail Control Centre, in particular the Fire Detection, Fixed Equipment and Rail Traffic Management Controllers. In the light of discussions with the CTSA and its experts about the supporting risk analysis and the additional mitigating measures necessary to support such a change, Eurotunnel submitted a revised study in July 2008 and proposed that the new procedures should be the subject of a 6-month trial after which a report would be submitted to the CTSA prior to the full implementation of the new procedure. At the end of the period covered by this report the report of the trial was awaited by the CTSA.
- **Catenary Earthing** – A key issues arising from the fire on 21 August 2006 (see paragraphs 16 - 18 below) was the length of time that it took Eurotunnel's technicians to earth the catenary. One of the recommendations of the RAIB report was that Eurotunnel, in consultation with the emergency services in France and the UK, should carry out a study to assess the feasibility of decreasing the time taken to carry out this procedure in an emergency situation. In the period leading up to the fire on 11 September Eurotunnel had undertaken discussions with the emergency services who provide the French and UK First Line of Response (FLOR) teams. Eurotunnel had kept the CTSA informed of developments but had not submitted any formal proposals for modifying the current arrangements. The CTSA had made it clear that any proposals would need to be supported by a robust risk assessment and evidence of a safe system of work.

The time taken to earth the catenary was again a significant factor in responding to the fire on 11 September. Further consideration of this matter is one of the main components of the actions being taken in response to the fire as described earlier in this report.

- **STTS Vehicles** – The CTSA continued to monitor the position regarding the condition of Eurotunnel’s special dedicated service tunnel vehicles (Service Tunnel Transportation System vehicles – STTS). These vehicles are an essential part of the safety procedures for the tunnel and inspections carried out by CTSA inspectors had led to concerns about an apparent deterioration in both the vehicles themselves and their hands-free guidance system. During the year Eurotunnel confirmed that a budget had been allocated to a programme of maintenance of these vehicles during the period up to 2012.

- **Emergency Exercises** – As usual the IGC and the CTSA monitored carefully Eurotunnel’s exercise regime designed to test emergency plans and procedures in a practical way. During the period covered by this report the following exercises took place:
 - **Exercise BINAT 18** – The BINAT 18, the annual full deployment exercise, took place on Sunday 13 January 2008. Although French led, the exercise involved the emergency services and support agencies of both nations. The scenario was based on a vehicle fire in a Eurotunnel passenger shuttle, causing panic and the stopping of the shuttle within the Tunnel. Once again there were a number of opportunities for improvement noted during the exercise as can be expected with one of this scale. These centred on operations and observer capacity within the two control centres, parking below ground and incident communications and were addressed as part of an Action Matrix during 2008.

 - **VALEX/COMEX** – This joint exercise was held on the 23rd April 2008 and was the first of two exercises designed to review and familiarise members of the EROs and Eurotunnel in respect of their individual and joint roles, responsibilities and procedures in response to underground incidents at the Channel Tunnel. It was also an opportunity to reinforce the principles of the underground layout plan ratified by members of the UK emergency services in May 2008.

 - **VALEX** – A second exercise, similar to the one above in April 2008, was held on 24th June 2008. This gave more members of the emergency services and Eurotunnel the chance to participate and benefit from the successful format of the previous event.

 - **Super-Tablex** – This exercise took place on the 5th November 2008 and acted as a prelude to the forthcoming Bi NAT exercise. Members of the emergency services and other agencies took part in a simulated exercise to examine their actions in an incident similar to the one that would be

experienced during BINAT 19. The exercise proved to be a useful and innovative method of exposing possible learning points in advance of a major exercise.

- **Exercise BINAT 19** – The BINAT 19 exercise took place on Sunday 11th January 2009 and was therefore outside the period covered by this report. However its planning was concluded during 2008. The exercise, which was UK led, was based on a scenario with the discovery of 7 unconscious passengers on a Eurotunnel passenger shuttle, which was forced to stop in the Tunnel. The exercise was run in two parts; starting as a table top and then moving to real play. Once again there were a number of opportunities for improvement noted. Work will continue throughout 2009 on the Action Matrix, led by a specially appointed working group of EPC (Emergency Planning Committee).

D 2 – Detailed Data Trend Analysis

14. Within the terms of the Common Safety Indicators (CSIs) there were only two accidents during 2008. There were no fatalities and only one injury. There were relatively few recorded precursors. A detailed trend analysis related to the CSIs would not therefore be meaningful. A trend analysis based on the definitions and information contained in the Eurotunnel Annual Report on Health and Safety (January to December 2008) is as follows:

Passenger Safety²

- **Accidents:** For 2008 there was one recorded accident in the individual risk category, the uncontrolled movement of a coach onboard a passenger shuttle on 4 April, and one recorded accident in the collective risk category, the fire onboard an HGV shuttle on 11 September. The only accident recorded in 2007 fell into the individual risk category, and involved a customer falling from his lorry cab and sustaining a broken wrist. There were two accidents in 2006 (one individual risk and one collective risk); one in 2005 (individual risk); and one in 2004 (collective risk).
- **Near-misses:** The number of near-misses fell from an average of 17 for 2004-2007 to 12 for 2008 (-32%) for collective risk. The number of near-

² Safety-related events (passenger or personnel/collective or individual) are classified as follows:

Accident (A): an undesired event: collision/derailment/major fire/serious injury or fatality;

Near-miss (NM): an accident situation, but one in which the undesired event has been avoided due to a favourable circumstance e.g. overrun without collision/broken rail without derailment;

Precursor (P): an event that does not carry any major risk but which highlights a fault in the safety system or which would be likely to affect it if the necessary action was not taken e.g. SPAD A with ATP/broken rail event with TVM information/major fuel spillage.

misses for individual risk remained stable with an average of 296 for the period 2004-2007 compared to 298 for 2008. , and fell from an average of 415 for 2000-2006 to 241 for 2007 (-42%) for individual risk. [There was an increase in near misses for individual risk in the period following the 11 September fire due, amongst other things, to emergency brakings with stops when traversing the Beussingue crossing point, a point known for causing such events. Passage of trains via the Beussingue crossing point is usually rare but during the rebuilding works at Interval 6 the route had to be used regularly.]

- **Precursors**: The number of precursor events relating to collective risk fell from an average of 358 for 2004-2007 to 310 for 2008 (-13%). For individual risk, it fell from an average of 596 for 2004-2007 to 567 for 2007 (-4%). [There was an increase in emergency braking without stops when traversing the Beussingue crossing point in the period following the 11 September fire for the reason given above.]
- **Collective risk analysis**: the overall number of accidents, near-misses and precursors fell, in absolute terms, by 14% in 2008 compared with the average results for 2004-2007.
- **Individual risk analysis**: the overall number of accidents, near-misses and precursors fell, in absolute terms, by around 6% in 2008 compared with the average results for 2004-2007.
- **Cumulative results (collective and individual safety events together)**: the 2008 result, in numbers of events, is down 8% compared with the 2004-2007 average figures.
- **Overall**: With 2 accidents 2008 is comparable to 2006. The increase in individual risk incidents in 2008 is explained, amongst other things, by the spate of incidents linked to the use of the Beussingue crossing point during the rebuilding works at Interval 6 following the 11 September fire. Analysis of the the 2008 performance in comparison with the period 2004-2007 show a significant 8% decrease in incidents.

Signals Passed At Danger (SPADs)³

- **SPADs A (Driver Error)** – With two SPADs A occurring in 2008 the low level of incidents of this kind reached since 1999 was maintained. One of the two SPADs A occurred on the main track and involved a Eurotunnel commercial mission protected by TVM which controls the collision risk to

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Only SPAD As and SPAD Cs are included in the UIC definition of SPADs. In addition, Eurotunnel, unlike many national railways, includes in its statistics all SPADs occurring on the infrastructure, including those on secondary track and track under possession.

a very low level. The second occurred on the main track at the interface between SNCF and Eurotunnel and involved a works train not protected by TVM. The incident was linked to the non-authorized access to the Eurotunnel Concession by a works train from a French Infrastructure Manager following an error by the SNCF driver.

- **SPADs C (Operator Error)** – With only a single SPAD C occurring in 2008 the lowest level since 1999 was achieved. The incident involved a red flag, which had been left behind by mistake after a works possession, being passed by a Eurotunnel HGV shuttle train. The train was travelling on track equipped with TVM signalling.

Employee Safety

- **Number of Lost Time Accidents** – The total number of lost time accidents for 2008 was 40 (15 for Eurotunnel staff and 25 for contractors). This compares with 41 in 2007 (23 for Eurotunnel staff and 18 for contractors). Initiatives aimed at targeting the significant deterioration in lost time accident performance in respect of contractors were to be introduced in 2009.

15. **Common Safety Indicators (CSIs)** – Data relating to the CSIs as defined in the Railway Safety Directive (2004/49/EC) is at Annex C.1. Annex C.2 shows trends in CSI on the basis of an average over the past three years. Annual reports relating to safety on the Fixed Link published by the CTSA prior to 2006 have included information about a greater variety of incidents than those required by the Railway Safety Directive. For the sake of continuity this information is summarised in Annex D.

D 3 – Results of Safety Recommendations

16. A report by the Railway Accident Investigation Branch (RAIB) into the circumstances surrounding the fire which occurred on an HGV shuttle train in running tunnel north on 21 August 2006 was published on 23 October 2007. The report confirmed that the immediate cause of the accident was a fire in the load compartment of a lorry on the penultimate wagon of an HGV shuttle. The investigation did not reveal any evidence of a requirement for change in the existing safety strategy following the detection of fire on an HGV shuttle nor any need for modification of the rolling stock. However, the RAIB investigators identified a number of issues that should be addressed by Eurotunnel in order to improve the efficiency of any future emergency response. While the 16 recommendations in the report proposed action by Eurotunnel, in keeping with normal practice they were formally addressed to the IGC as the safety authority for the fixed link within the terms of the Railway Safety Directive. (The full investigation report is available on the RAIB website – www.raib.gov.uk.)

17. The IGC asked the CTSA to advise on the report and its recommendations. In the light of the CTSA's advice the IGC wrote to the RAIB on 30 May 2008 with detailed responses to each of the recommendations. The IGC concluded that 11 of the 16 recommendations could be closed either because they had been accepted and where appropriate implemented or because after careful consideration it had been concluded that no further action was appropriate. The IGC informed the RAIB that the remaining 5 recommendations were the subject of further work and that a further progress report would be made in due course. At the end of the year covered by this report a further response to the RAIB was being prepared. The further fire on an HGV shuttle train which occurred on 11 September 2008 was clearly relevant in the context of the recommendations arising from the 2006 fire. This would be taken into account in the IGC's further response to the RAIB.

18. A formal investigation into the 2006 fire was conducted by the UK Office of Rail Regulation (ORR) in parallel to the RAIB investigation. The ORR report was completed in April 2008. The 4 recommendations were added to the log of recommendations from inspections which is maintained and monitored by the CTSA.

E - Important Changes in Legislation and Regulation

19. **The Regulation of the IGC on the Safety of the Channel Fixed Link** – Following completion of internal procedures by the British and French Governments the binational regulation to implement the Railway Safety Directive (2004/49/EC), developed by the IGC using powers conferred upon it by the Treaty of Canterbury, came into force on 4 July 2008.

20. The IGC wrote to Eurotunnel and to all railway undertakings using the fixed link on 11 July to inform them that the regulations were in force and to draw their attention to the transitional arrangements applying to the requirements relating to safety authorisation and certification. The IGC wrote further to Eurotunnel and the railway undertakings on 2 October enclosing guidance on the application of the regulation.

21. The binational regulation transposes all the requirements of the Directive with the exception of the requirements relating to independent accident investigation. These provisions are transposed in French and UK national legislation with the national investigation bodies – BEATT for France and RAIB for the UK – having the power to carry out investigations in their respective halves of the Fixed Link. In line with the procedure described in Article 22 of the Directive, the two bodies operate a formal agreement under which investigations relating to incidents and accidents occurring on the Fixed Link are carried out in cooperation.

22. At the end of the period covered by this report an amendment to Railway Safety Directive was adopted (2008/110/EC). An important task for 2009 will be the consideration of the impact of the amendment on the IGC's binational regulation.

23. **Formal Submissions to the IGC** - Under the provisions of the Concession Agreement under which Eurotunnel operates the Fixed Link, it is required to submit to the IGC for approval the operating rules and safety arrangements for the Fixed Link which the company proposes be introduced. As the Concession Agreement is a binding contractual agreement these rules have a legal basis. During the course of the period covered by this report the following changes were considered:

- **Volume E “Internal Operations Plan” of Eurotunnel’s Safety Arrangements**
- Towards the end of 2007 Eurotunnel had made a formal submission to the IGC proposing the introduction of a new paragraph relating to the interpretation of a clause in the Concession Agreement that deals with arrangements in the case of trains becoming immobilised in the Channel Tunnel. In the light of advice from the CTSA, the IGC had responded to Eurotunnel on 28 December confirming its approval subject to the correction of typographical errors in the submitted text. The new version of Volume E of the safety arrangements came into effect on 8 January 2008. At the end of the period covered by this report a further revision of Volume E was anticipated which included, amongst other things, the text of a

principle relating to the exit of incident trains from the tunnel and a methodology for the conduct of debriefings in the light of incidents and accidents;

- **Volume F “Carriage of Dangerous Goods” of Eurotunnel’s Safety Arrangements** – Eurotunnel made a formal submission to the IGC proposing a revision of Volume F of its safety arrangements. Eurotunnel’s submission proposed editorial changes to the text of the document as well as taking account of the latest versions of the ADR/RID documents. In the light of consideration by the CTSA, the IGC responded to Eurotunnel on 23 December 2008 confirming that it had no objection to the implementation of the revised version subject to detailed amendments requested by the CTSA being made.

24. **Other Significant Regulatory Issues Considered by the IGC and CTSA** - Other important issues considered by the IGC and the CTSA during the course of the year were as follows:

- **GSM-R** – Eurotunnel continued to develop its plans for the installation of a GSM-R communications system throughout the tunnel and the CTSA and its experts continued to engage in discussions with Eurotunnel about the project. During the course of the year Eurotunnel finalised and issued its tender enquiry document. At the end of the year covered by this report Eurotunnel had yet to take a decision on a system provider. As this project is covered by the requirements of the Interoperability Directives Eurotunnel will need to appoint a notified body at the appropriate time.
- **Power Supply Arrangements** – Throughout the year Eurotunnel continued with its observation period of arrangements for power supply for the catenary to be drawn solely from the French national grid, in usual situations. At the end of the year, a comprehensive report to the CTSA on the observation period was awaited. The CTSA had made it clear that only in the light of a satisfactory report could the new arrangements be considered as an acceptable permanent operational system.
- **New Floor for Breda Wagons** – In April 2008 Eurotunnel submitted to the IGC proposals to modify the floors of the Breda HGV carrier wagons in view of the accelerated ageing of the existing floors. In June 2008 the IGC informed Eurotunnel that it had no objection to the design and building of one or more prototypes to enable validation tests to be conducted. The IGC made it clear that non objection to the modification of the whole fleet would be conditional on satisfactory completion of the tests and finalisation of the design.
- **Future Design of Freight Shuttles** – In addition to the modifications made or intended to its existing fleets of HGV carrier wagons (see above regarding the Breda fleet and paragraph 13 regarding the Arbel fleet), Eurotunnel has kept the IGC and the CTSA informed of its studies regarding the design of a new generation of wagons. At the end of the period covered by this report Eurotunnel had not submitted formal proposals. The IGC and the CTSA continue to attach considerable importance to the development of a more permanent solution to the problems that have arisen from the ageing and deterioration of the two existing fleets.

25. **Other IGC and CTSA Activities** – Significant activities by the IGC and CTSA during the year were as follows:

- **Participation in the Work of European Railway Agency and Its Working Groups** – The IGC and the CTSA continued to play a full part in the work of the European Railway Agency (ERA) and its various working groups. Given their limited resources it was necessary for the IGC and the CTSA to participate directly in those activities which were of the greatest interest and, for other activities, to rely on liaison with, and feedback from, experts from the UK and French safety authorities. Nevertheless, the IGC and CTSA continued to play an active part in meetings of the ERA Network of National Safety Authorities and in working groups dealing with common safety methods, common safety indicators, authorisation and certification, and national safety rules. In addition, the IGC and the CTSA gave careful consideration to all questionnaires and surveys received from the ERA and made substantive responses wherever it was considered appropriate.
- **Change Management - Handling Future Submissions** – During 2007 the IGC had given its agreement to the trialling of new procedures developed by the CTSA for determining when modifications to Eurotunnel's existing arrangements were sufficiently significant to require the involvement and agreement of the IGC and the CTSA. This work was considered to be particularly important in relation to the requirements relating to "substantial change" in the Railway Safety Directive. Unfortunately, the start of the trial was delayed, initially by IT difficulties, and subsequently by the priority which it was necessary to give to actions arising from the fire on 11 September 2008. It was hoped that the trial would start early in 2009.
- **Impact of the Interoperability Directive and the TSIs on the Fixed Link** – The IGC and the CTSA have continued to give consideration to the impact of the Interoperability Directives and the TSIs on the arrangements which apply in respect of safety on the Fixed Link.

With regard to the Interoperability Directive, the IGC decided to establish a special ad hoc working group to consider the approach to be adopted to the transposition of the Directive to the Fixed Link. The preferred approach is for coherent and compatible national transpositions applying to the British and French sides of the Fixed Link thereby avoiding the need for a further binational regulation.

With regard to the TSIs an urgent task for 2008 was to carry out a detailed inventory of the TSIs and to develop a suitable strategy in relation to the Fixed Link. At the end of the period covered by this report careful consideration was being given to the possible need to put forward to the ERA arguments for specific cases to be inserted in the TSIs to take account of the unique circumstance of the Fixed Link.

- **Notification of Safety Rules** – Following the European Commission's rejection of the original notification of the unified safety rules in respect of the Fixed Link as required by Article 8 of the Railway Safety Directive (2004/49/EC), a revised

notification was submitted via the UK and French Permanent Representatives to the European Union at the beginning of 2008. At the end of the year the revised notification was still being scrutinised by the ERA and the response of the European Commission was awaited.

- **Directive on the Certification of Train Drivers (2007/59/EC)** – The IGC decided to establish a special ad hoc working group to consider the approach to be adopted to the transposition of the Directive to the Fixed Link. The preferred approach in respect of licensing is for coherent and compatible national transpositions applying to the British and French sides of the Fixed Link thereby avoiding the need for any binational regulation. At the end of the year covered by this report the IGC wrote to Eurotunnel to inform it of the intended approach.

F - The Development of Safety Certification and Authorisation

26. Under the transitional provisions in the binational regulation to implement the Railway Safety Directive which came into force on 4 July 2008, Eurotunnel's previously accepted safety case was deemed to be a safety authorisation for a period of up to one year (i.e. until 4 July 2009). In the same way the previously accepted safety cases for the railway undertakings which operate through the Fixed Link were deemed to be Part B safety certificates for a period of up to two years (i.e. until 4 July 2010).

27. Throughout 2008 Eurotunnel and experts from the CTSA were engaged in discussions about the development of Eurotunnel's SMS documentation. A formal application to the IGC for authorisation was anticipated early in 2009 and will be reported upon in our 2009 report.

28. By the end of the period covered by this report the IGC had received no applications for Part B. In due course, applications are anticipated from EWSI, DB Schenker (Rail) UK Ltd, Eurostar UK, SNCF and Europorte 2.

G - Supervision of Railway Undertakings and Infrastructure Managers

29. The 1986 Treaty of Canterbury places responsibility on the CTSA to ensure that the safety measures and practices applicable to the Fixed Link comply with the national or international laws in force, to enforce such laws, to monitor their implementation and to report to the Intergovernmental Commission. It also states that for the purpose of carrying out its functions, the Safety Authority may invoke the assistance of the authorities of each Government or any body or expert of its choice and that the two Governments shall grant to the Safety Authority and its members and agents such powers of investigation, inspection and direction as are necessary for the performance of its functions. The Concession Agreement states that the Concessionaires shall afford access to all parts of the Fixed Link to persons duly authorised by the IGC or, under its supervision, by the CTSA, for the purposes of any of their functions, to inspect the Fixed Link and to investigate any matter relating to its construction or operation and shall afford such persons the facilities necessary for the performance of these functions.

30. During 2008 the safety performance of Eurotunnel and the railway undertakings operating on the Fixed Link was assessed against the regulatory arrangements which preceded those prescribed by the Railway Safety Directive. These arrangements were based on monitoring compliance with the Eurotunnel safety case, which included the safety cases of the railway undertakings as supporting documents. The following methods were used:

- Inspections;
- Flow of information – regular reports from Eurotunnel such as the daily Operations Duty Manager (ODM) reports; monthly summaries of safety events (known as ‘Flash reports’); Safety Committee Minutes; Operating Performance reports etc;
- Information gained from the investigation of accidents and incidents;
- Audit reports (both internal and external);
- Ad-hoc meetings between Eurotunnel and Safety Authority experts;
- Information from Eurotunnel concerning the interface with the railway undertakings and change management.

31. Planned inspection activity continued to be based on areas identified by the CTSA’s experts during their analysis of the Eurotunnel safety case. However, inspection plans retained sufficient flexibility to respond to areas which emerged from Eurotunnel’s activities during the course of the year. Priorities included:

- Follow-up inspections in relation to RAIB’s report of 21 August 2006 fire;
- Crisis management arrangements;
- The management of incidents and accidents with the emergency services;
- Examination of Eurotunnel’s safety culture, in particular, human factors;
- Eurotunnel’s programme to replace damaged sections of the track bed (Project TAPIS III); and
- Competence of Eurotunnel’s staff and contractors (continued from previous year).

32. The 31 planned inspections undertaken during the course of the year included the following areas:

- Training of safety critical staff and staff competency;
- Inspections of UK and French terminals including terminal structures; resistance of structures to vehicle impact; and maintenance procedures for emergency equipment;
- Maintenance of the communication systems;
- Re-railing of the UK terminal;
- Procedures for the carriage of dangerous goods on the platform and in the tunnel;
- Maintenance of service tunnel transport system (STTS) and its guidance system;
- Roles and responsibilities of UK terminal control centre (TCC) in particular the procedures for alerting the emergency response organisations (EROs);
- Replacement of compressed air pipes
- Monitoring the condition of the pagodas on the Arbel wagons;
- Procedures for HGV loading and role of the Agent de Feu;
- UK and French ventilation stations;
- TAPIS III project;
- Management of the function safety of the fixed equipment; and
- Shuttle train brakes.

33. As well as the 31 inspections, there were 2 audits undertaken during 2008 by the Etablissement Public de Securite Ferroviaire (EPSF). The first related to operating safety processes and safety management in relation to them. The second related to rolling stock maintenance.

34. The inspections and audits led to a number of recommendations which were formally communicated to Eurotunnel by the CTSA. The recommendations were added to a consolidated log of recommendations to enable the CTSA to monitor and review with Eurotunnel its progress in taking suitable action in response to them.

35. In addition to the 31 planned inspections carried out, several more were undertaken in relation to the fire in running tunnel north on 11 September 2008. In the aftermath of the fire, various presentations, ad-hoc inspections and weekly meetings were held between the Authority's experts and Eurotunnel.

36. Overall the inspection programme for 2008 and other monitoring activities undertaken during the course of the year indicated that while there was a continuing need for vigilance the operation of the Fixed Link continued to be acceptably safe.

37. Looking to the future, the CTSA has now drawn up an outline inspection and audit programme over a period of 5 years which takes account of the key elements included in, Eurotunnel's Health and Safety Management System (SMS).

H - IGC Conclusions on Year 2008 - Priorities

38. The channel tunnel railway is of immense importance, carrying over ten million passengers between Britain and France each year and connecting Britain to the high speed rail network of the European mainland. It is therefore right that close attention should be paid to the safety regulation of the Fixed Link.

39. The safety standards achieved for the channel tunnel operation in the year 2008 were, overall, satisfactory, except for the fire of 11 September. Although no lives were lost nor significant injuries sustained as a result of this incident, it significantly damaged the tunnel, caused its partial closure for a period, disrupted services, required extensive and expensive rebuilding, and placed those involved in the incident in a situation of danger. It has required close investigation to ensure lessons are learned.

40. Priority issues of concern into the future include:

- further action to consider the implications of the fire of 11 September 2008, on which a programme of action is underway to consider improvements in HGV loading procedures, speed of intervention in the event of a fire, and adaptation of the infra-structure to aid fire suppression. A report is expected from the Bureau des Enquetes des Accidents - Transports Terrestre (BEA-TT) during 2009
- the need to review the safety rules for the tunnel in the light of the further development of the European system of Technical Specifications for Interoperability (TSIs)
- applications for renewal of the certification of the railway undertakings that currently use the tunnel, which are required by July 2010 for those operators that wish to continue operations through the tunnel
- preparations for the possibility that new entrants will wish to run services through the tunnel, at some point in the future
- discussions with national Governments, in France and the UK, of the most effective method of transposition for the tunnel of new European law, including that relating to interoperability and to the licensing of international train drivers, and consideration of the most effective means of implementing new requirements arising from the work of the European Railway Agency (ERA)
- consideration of plans to modify installations and, in particular, rolling stock, in order to maintain its effectiveness despite the deterioration caused by heavy use, and to introduce new rolling stock
- consideration of developments relating to communication systems in the tunnel, including the installation of GSM-R, the upgrading of the radio system used by the emergency services, and longer term plans
- attention to the health and safety of the workforce
- the maintenance of preparedness to deal with serious safety incidents, including through the annual rehearsal of the binational emergency plan, which provides the framework for the co-operation of the emergency response organisations of both countries in the event of an accident or incident in the tunnel, particularly in the run-up to the 2012 Olympic games in London.

I - Sources of Information

41. The following sources were used when drafting this report:

- Eurotunnel Annual Report on Health and Safety for 2008 (submitted 1 July 2009).
- Europorte 2 Annual Safety Report for 2008 (submitted 14 May 2009)
- Eurostar Annual Safety Report for 2008 (submitted 24 June 2009)
- Rapport de la SNCF sur la sécurité de l'exploitation en 2007 sur la section commune trans-Manche pour ses missions d'entreprise ferroviaire (edition du 30/06/2009 version 01)
- EWSI Annual Safety Report for 2008 (submitted 4 August 2009)

J - Annexes

ANNEX A: Railway Structure Information

ANNEX B: IGC Structure and Relationships

ANNEX C: Data on Common Safety Indicators

ANNEX C1: Safety related incidents previously included in reports by the CTSA

ANNEX A: Railway Structure Information

A.1. Network map

Network maps showing the layout of the UK and French terminals and a condensed layout of the running tunnels, including the two crossovers are included overleaf.

A.2 Information about Eurotunnel - The Infrastructure Manager for the Channel Tunnel Fixed Link

Name: Eurotunnel

Address: UK Terminal, Ashford Road, Folkestone, Kent CT18 8XX

Website: www.eurotunnel.com

Network Statement Link – English version:

http://www.eurotunnel.com/NR/rdonlyres/02B57D98-A0DF-49D8-9010-7F75A4D76F9D/0/DRR_NS_2009_EN_Final2.pdf

Network Statement Link – French Version:

http://www.eurotunnel.com/NR/rdonlyres/5EF03285-CF75-4559-ABAC-0E5D9F129DAC/0/DRR_NS_2009_FR_Final2.pdf

Start Date of Commercial Activity: May 1994

Total Track Length: 159 km main tracks plus 50 km secondary tracks

Track Gauge: UIC

Electrified Track Length: All track both main and secondary is electrified

Voltages: 25,000 volts alternating current

Total Double/Single Length Track: 100% double track

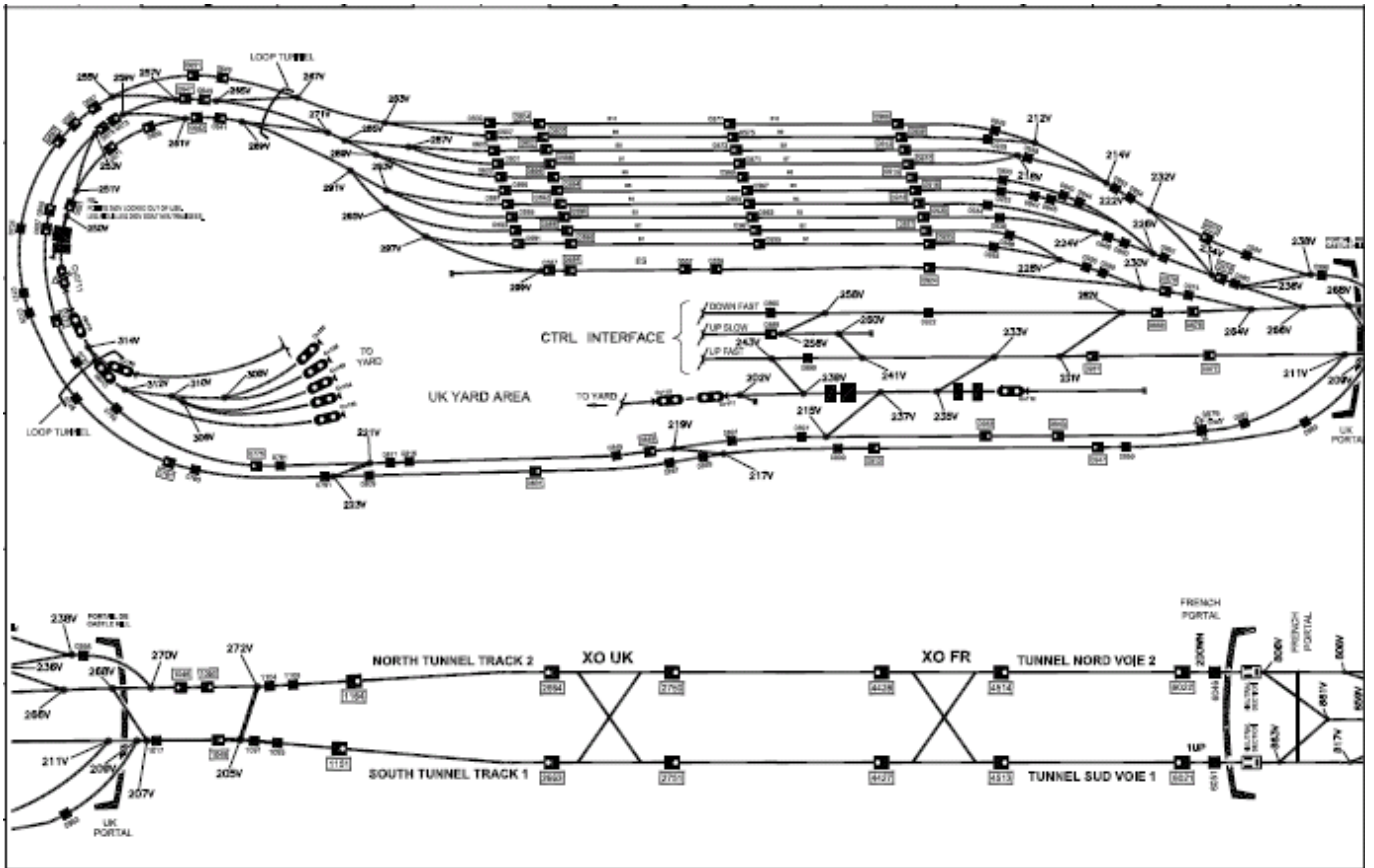
Total Track Length – High Speed Line: 108 km

Automatic Train Protection Equipment Used: TVM 430

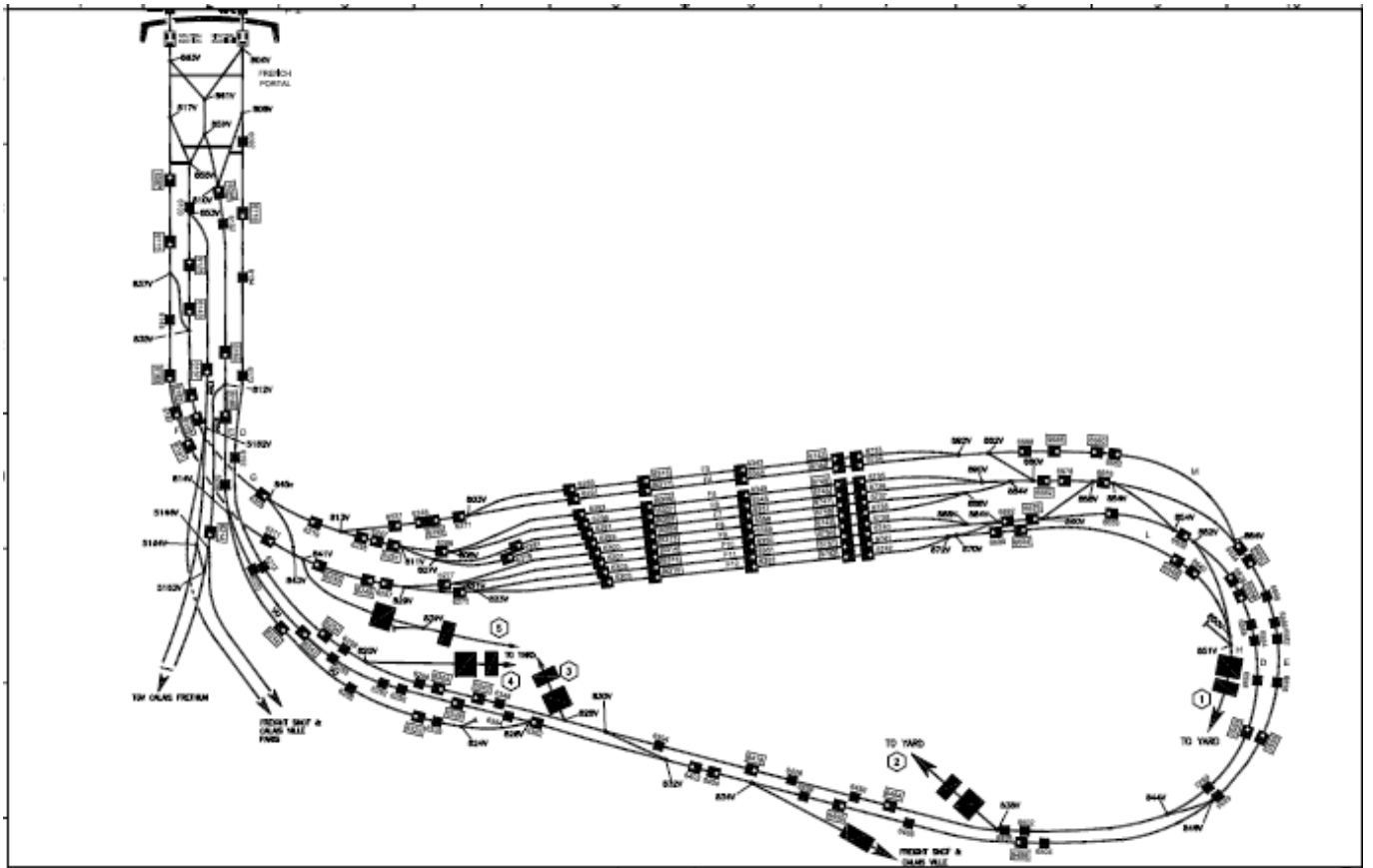
Number of Level Crossings: None on main tracks

Number of Signals: 655

Network Map Showing Layout of UK Terminal and Running Tunnels



Network Map Showing Layout of French Terminal



A.3 Information about the Railway Undertakings

The railway undertakings which operated trains through the Fixed Link in 2007 were as follows:

Name: English Welsh and Scottish International Ltd

Address: National Business Centre
Lakeside Business Park
Carolina Way
Doncaster
South Yorkshire
DN4 5PN

Website: www.rail.dbschenker.co.uk

Name: Eurostar (UK) Ltd

Address: Eurostar House
Times House
Bravingtons Walk
Regent Quarter
London
N1 9AW

Website: www.eurostar.com

Name: SNCF

Address: 34 rue du Commandant Mouchotte
75699 Paris CEDEX 14

Website: www.sncf.com

Name: Europorte 2

Address: c/o Eurotunnel
19 Boulevard Malesherbes
75008 Paris,
France

ANNEX B: IGC STRUCTURE AND RELATIONSHIPS

[Annexes B.1 and B.2 included in separate "Powerpoint" file]

ANNEX C: DATA ON COMMON SAFETY INDICATORS

Data on Common Safety Indicators for 2008 is shown in Annex C.1. The 2008 data has been reproduced alongside the data for 2006 and 2007 at Annex C.2 to allow comparison between the three years. [The data is contained in a separate "Excel" files]

It should be noted that no information is available about total number of passenger kilometres or passenger journeys. Eurotunnel only has information about numbers of vehicles transported.

In 2008 Eurotunnel transported 1,254,282 lorries, 1,907,484 cars and 55,751 coaches.

In addition, there were a total of 9,146,335 Eurostar passengers.

ANNEX C1: SAFETY RELATED INCIDENTS PREVIOUSLY INCLUDED IN REPORTS PUBLISHED BY THE CTSA

Total number of events reports to the CTSA in 2008 = 124

Fuel Spillages	=	68
Unscheduled stops greater than 30 minutes	=	29 (See note 1)
Track/rail problems	=	8
SPAD As (Driver)*	=	2
SPAD Cs (Operator Error)*	=	1
Catenary trips	=	1
Fire/Smoke	=	6
Injuries	=	5 (See note 2)
Door open on train	=	1
Damaged Axle	=	1
Damage to Fixed Equipment	=	1
Suspension of commercial services for over two hours	=	1

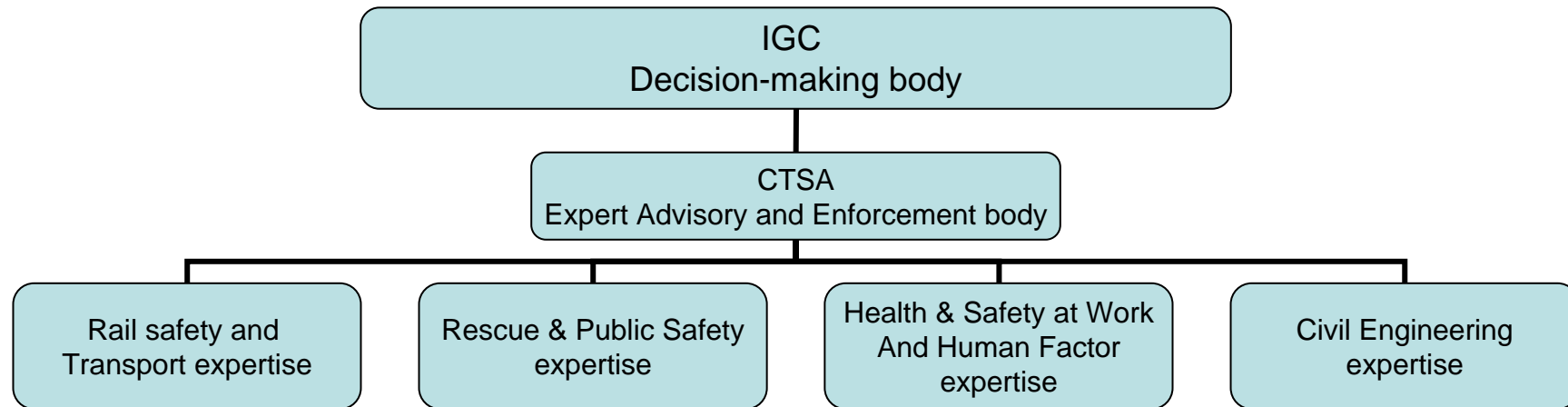
* Only SPAD As and SPAD Cs are included in the UIC definition of SPADs. In addition, Eurotunnel, unlike many national railways, includes in its statistics all SPADs occurring on the infrastructure, including those on secondary track and track under possession.

Notes

- (1) Five of the 29 unscheduled stops led to evacuation of HGV shuttles: four of these were caused by false fire alarms. A sixth evacuation was caused by the fire on 11 September 2008.
- (2) Incidents involving injuries were as follows:
 - On 14 January the chef de train sustained injuries including a broken rib after falling over during the unloading of an HGV mission on the UK terminal;
 - On 23 January a ticket agent sustained a fractured left wrist after falling in the in the undercroft of the UK Passenger terminal Building;
 - On 4 April the driver of a coach on a passenger shuttle sustained crush injuries 23 April when his vehicle moved backwards and collided with the fire barrier;
 - On 12 April the driver of an HGV mission sustained a broken left wrist when opening the locomotive door;
 - On 4 July an SPIE technician sustained an injury to the top of his ear while standing under a bogie in an inspection pit in the workshops on the French terminal.

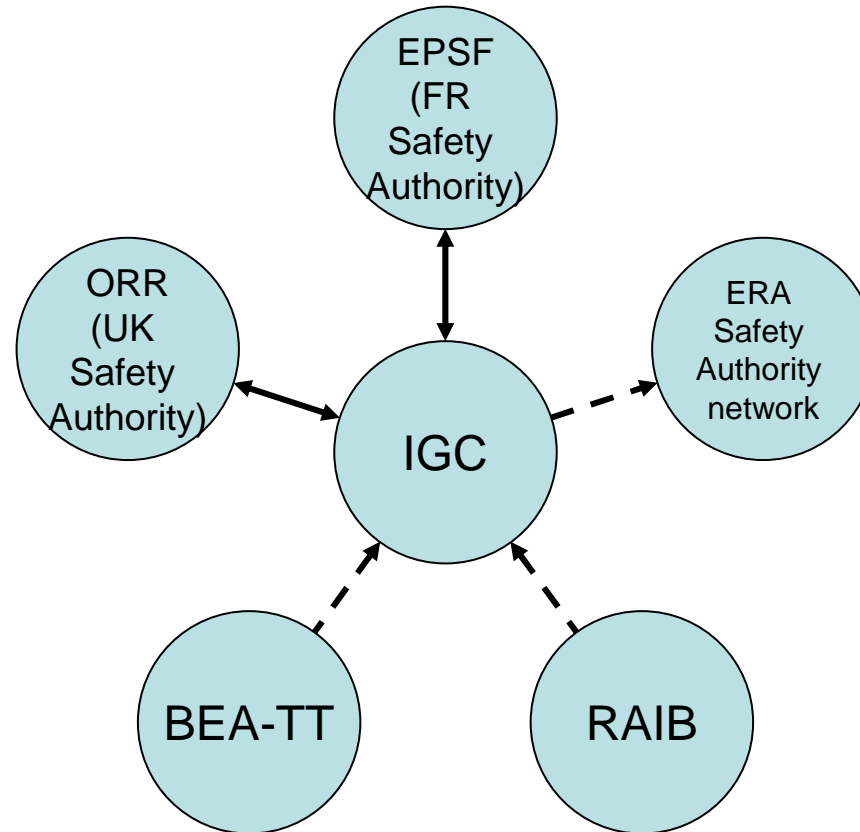
In addition to the above a number of HGV drivers sustained relatively minor injuries during the evacuation of the HGV shuttle with a fire onboard on 11 September.

IGC Structure



(This relates solely to the IGC's role as Safety Authority for the Channel Tunnel)

IGC Relationships with Other Bodies



Arrows indicate main direction of communication and substantive links.

Common Safety Indicators (CSI)

1. Indicators relating to accidents

1.1a. Total number of accidents and a break-down into the following types of accidents

1.1b. Relative to train kilometres number of accidents and a break-down into the following types of accidents

	Total number of all accidents, excluding suicides	Collisions of trains, including collisions with obstacles within the clearance gauge	Derailments of trains	Level-crossing accidents, including accidents involving pedestrians at level-crossings	Accidents to persons caused by rolling stock in motion, with the exception of suicides	Fires in rolling stock	Others
code of variable	N00	N01	N02	N03	N04	N05	N06
1.1a. Number of accidents	2	0	0	0	1	1	0

	N10	N11	N12	N13	N14	N15	N16
1.1b. "Relative" Number of accidents (per million train km)	0.361.011	0.000	0.000	0.000	0.180.505	0.180.505	0.000

	Suicides
code of variable	N07
1.1a. Total number of suicides	0

	N17
1.1b. Relative to "billion" train kilometres number of suicides	0.000

1.2a. Total number of persons seriously injured by type of accident divided into the following categories

1.2b. Relative to train kilometres total number of persons seriously injured by type of accident divided into the following categories

1.2c. Relative to passenger kilometres total number of persons seriously injured by type of accident divided into the following categories (for passengers only)

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	TS00	TS01	TS02	TS03	TS04	TS05	TS06
1.2a. Total seriously injured	1	0	0	0	1	0	0

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	TS10	TS11	TS12	TS13	TS14	TS15	TS16
1.2b. "Relative" Total seriously injured (per million train km)	0.180.505	0.000	0.000	0.000	0.180.505	0.000	0.000

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	PS00	PS01	PS02	PS03	PS04	PS05	PS06
1.2a. Passengers	1	0	0	0	1	0	0

	PS10	PS11	PS12	PS13	PS14	PS15	PS16
1.2b. "Relative" Passengers (per million train km)	0.180.505	0.000	0.000	0.000	0.180.505	0.000	0.000

	PS20	PS21	PS22	PS23	PS24	PS25	PS26
1.2c. "Relative" Passengers (per billion passenger km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	SS00	SS01	SS02	SS03	SS04	SS05	SS06
1.2a. Employees including the staff of contractors	0	0	0	0	0	0	0

	SS10	SS11	SS12	SS13	SS14	SS15	SS16
1.2b. "Relative" Employees (per billion train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	LS00	LS01	LS02	LS03	LS04	LS05	LS06
1.2a. Level-crossing users	0	0	0	0	0	0	0

	LS10	LS11	LS12	LS13	LS14	LS15	LS16
1.2b. "Relative" Level-crossing users (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	US00	US01	US02	US03	US04	US05	US06
1.2a. Unauthorised persons on railway premises	0	0	0	0	0	0	0

	US10	US11	US12	US13	US14	US15	US16
1.2b. "Relative" Unauthorised persons (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	OS00	OS01	OS02	OS03	OS04	OS05	OS06
1.2a. Others	0	0	0	0	0	0	0

	OS10	OS11	OS12	OS13	OS14	OS15	OS16
1.2b. "Relative" Others (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Common Safety Indicators (CSI)

1.3a. Total number of persons killed by type of accident divided into the following categories

1.3b. Relative to train kilometres total number of persons killed by type of accident divided into the following categories

1.3c. Relative to passenger kilometres total number of persons killed by type of accident divided into the following categories (for passengers only)

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	TK00	TK01	TK02	TK03	TK04	TK05	TK06
1.2a. Total killed	0	0	0	0	0	0	0

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	TK10	TK11	TK12	TK13	TK14	TK15	TK16
1.2b. "Relative" Total killed (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Total number in all accidents, excluding suicides	In collisions of trains, including collisions with obstacles within the clearance gauge	In derailments of trains	In level-crossing accidents, including accidents involving pedestrians at level-crossings	In accidents to persons caused by rolling stock in motion, with the exception of suicides	In fires in rolling stock	In others
code of variable	PK00	PK01	PK02	PK03	PK04	PK05	PK06
1.3a. Passengers	0	0	0	0	0	0	0

code of variable	PK10	PK11	PK12	PK13	PK14	PK15	PK16
1.3b. "Relative" Passengers (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

code of variable	PK20	PK21	PK22	PK23	PK24	PK25	PK26
1.3c. "Relative" Passengers (per billion passenger km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

code of variable	SK00	SK01	SK02	SK03	SK04	SK05	SK06
1.3a. Employees including the staff of contractors	0	0	0	0	0	0	0

code of variable	SK10	SK11	SK12	SK13	SK14	SK15	SK16
1.3b. "Relative" Employees (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

code of variable	LK00	LK01	LK02	LK03	LK04	LK05	LK06
1.3a. Level-crossing users	0	0	0	0	0	0	0

code of variable	LK10	LK11	LK12	LK13	LK14	LK15	LK16
1.3b. "Relative" Level-crossing users (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

code of variable	UK00	UK01	UK02	UK03	UK04	UK05	UK06
1.3a. Unauthorised persons on railway premises	0	0	0	0	0	0	0

code of variable	UK10	UK11	UK12	UK13	UK14	UK15	UK16
1.3b. "Relative" Unauthorised persons (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

code of variable	OK00	OK01	OK02	OK03	OK04	OK05	OK06
1.3a. Others	0	0	0	0	0	0	0

code of variable	OK10	OK11	OK12	OK13	OK14	OK15	OK16
1.3a. "Relative" Others (per million train km)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

2. Indicators relating to incidents and near-misses

2.1a. Total number of incidents and near-misses and a break-down into the following types

2.1b. Relative to train kilometres number of incidents and near-misses and a break-down into the following types of accidents

	Total number of incidents and near-misses	Total number of broken rails	Total number of track buckles	Total number of wrong-side signalling failures	Total number of signals passed at danger	Total number of broken wheels on rolling stock in service	Total number of broken axles on rolling stock in service
code of variable	I00	I01	I02	I03	I04	I05	I06
2.1a. Number of incidents	11	8	0	0	3	0	0

code of variable	I10	I11	I12	I13	I14	I15	I16
2.1b. "Relative" Number of incidents (per million train km)	1.985.559	1.444.043	0.000	0.000	0.541.516	0.000	0.000

Common Safety Indicators (CSI)

3. Indicators relating to consequences of accidents

3.1a. Total costs in euro of all accidents

3.1b. Relative to train kilometres total costs in euro of all accidents

3.2a. Total number of working hours of staff and contractors lost as a consequence of accidents

3.2b. Relative to number of hours worked number of working hours of staff and contractors lost as a consequence of accidents

	Total costs of all accidents	Costs of deaths	Costs of injuries	Costs of replacement or repair of damaged rolling stock and railway installations	Costs of delays, disturbances and re-routing of traffic, including extra costs for staff and loss of future revenue
code of variable	C00	C01	C02	C03	C04
3.1a. Costs (in Euros)	€130 000 000	€0	€0	€60 000 000	€70 000 000

	C10	C11	C12	C13	C14
3.1b. "Relative" Costs (in Euros) (per million train km)	€23 465 704	€0	€0	€10 830 325	€12 635 379

	Total number of working hours of staff and contractors lost as a consequence of accidents
code of variable	W00
3.2a. Total number of working hours lost	0

	W10
3.2b. "Relative" Total number of working hours lost	0.000%

4. Indicators relating to technical safety of infrastructure and its implementation

	Percentage of tracks with Automatic Train Protection (ATP) in operation	Percentage of train kilometres using operational ATP systems	Total number of level crossings	Total number of level crossings per line kilometre	Percentage of level crossings with active (automatic or manual) protection
code of variable	T01	T02	T03	T04	T05
4. Number	100.00%	100.00%	0	0.000	n/a

5. Indicators relating to the management of safety

Internal audits accomplished by infrastructure managers and railway undertakings as set out in the documentation of the safety management system.

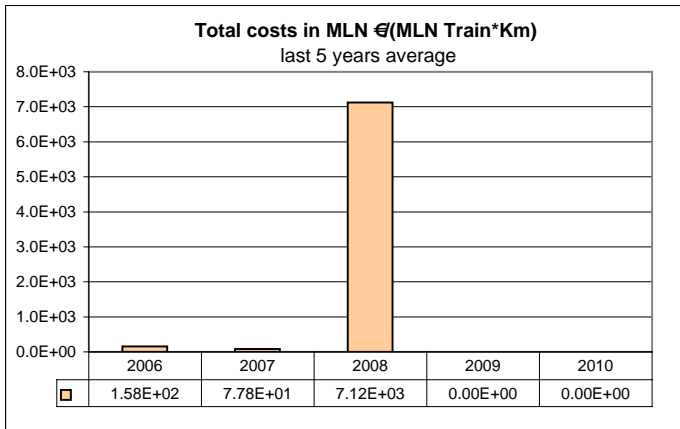
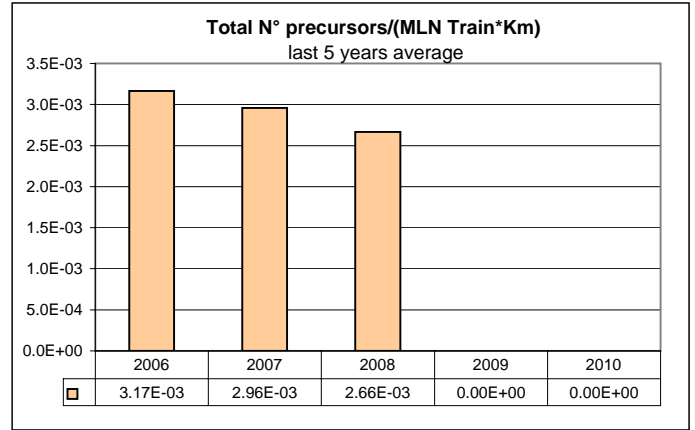
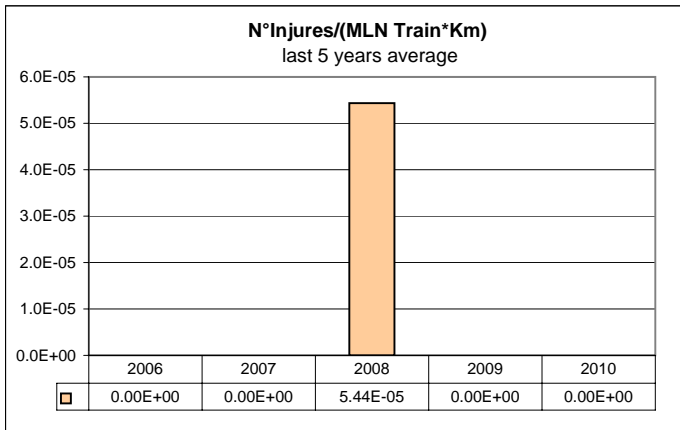
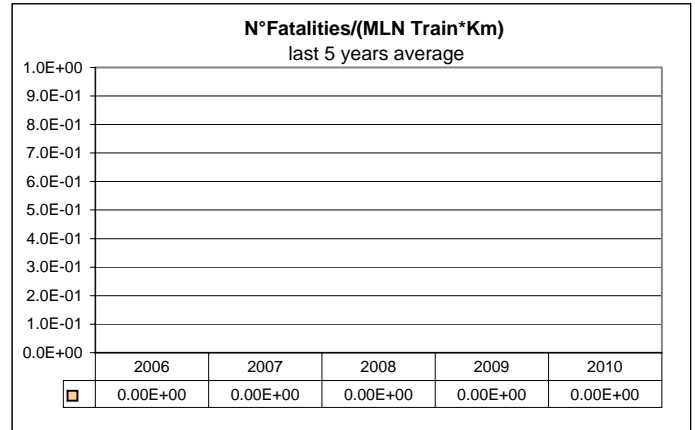
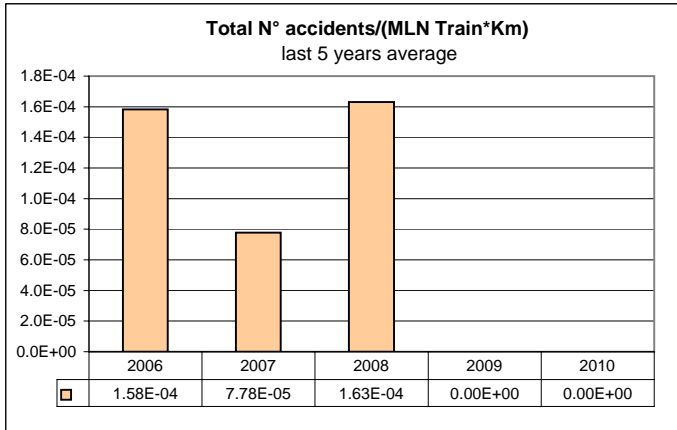
	Total number of accomplished audits	Percentage of audits accomplished /required (and/or planned).
code of variable	A01	A02
5. Number	24	59.0%

6. Reference data

	Number of Train kilometres (millions)	Number of Passenger kilometres (millions)	Number of passenger journeys (millions)	Tonnes of freight carried (millions)	Number of line kilometres	Total number of working hours (thousands)
code of variable	R01	R02	PaxJ	TonF	R03	R04
6. Number	5.540	See notes overleaf	See notes overleaf	1.240	159.000	3 514.810

C.1. CSIs data

Performances at a glance



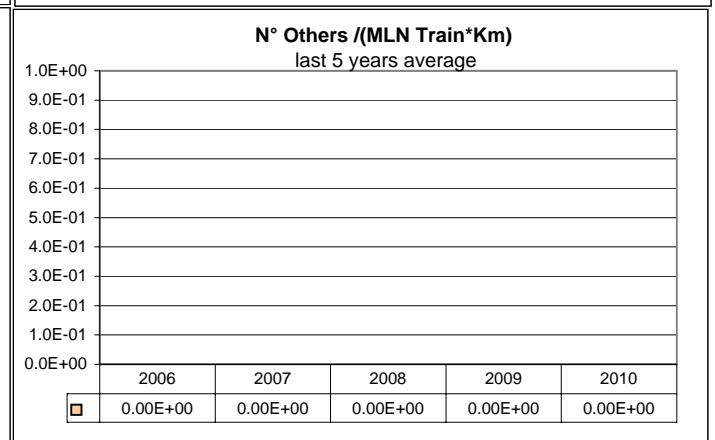
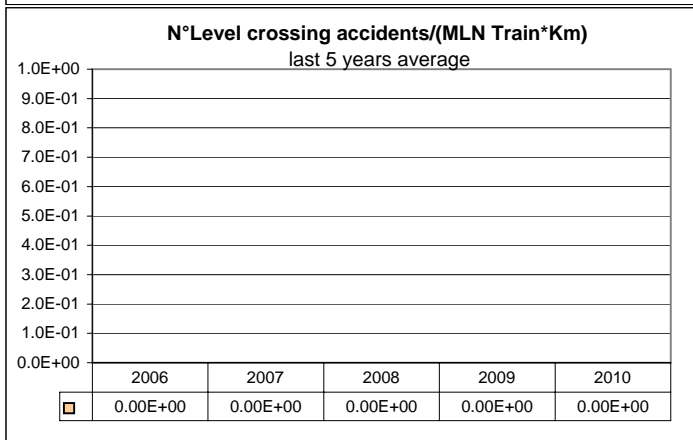
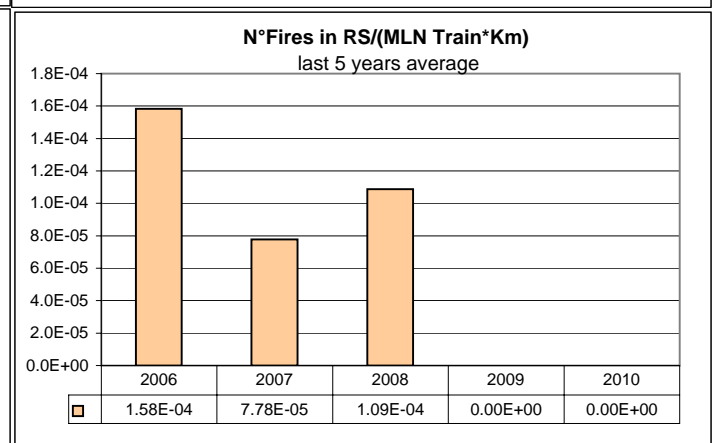
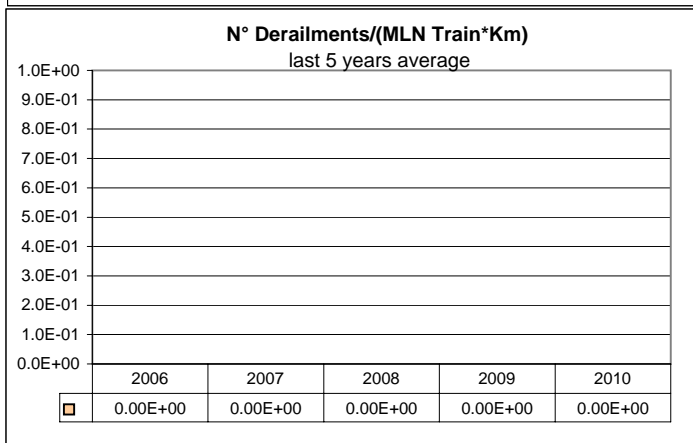
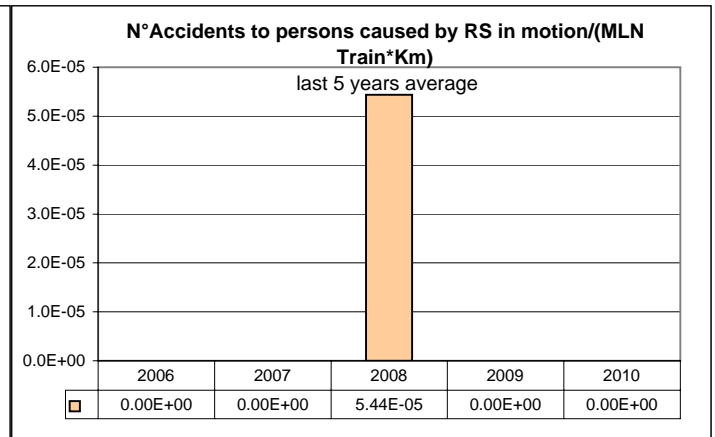
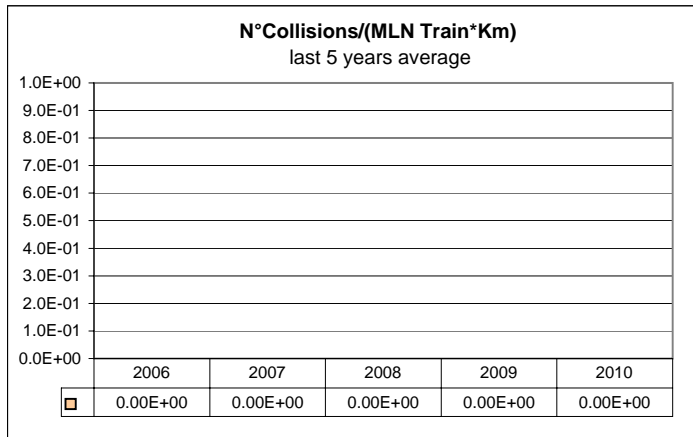
2007 report: values related to 2006.

2008 report: values related to the average between 2006 and 2007.

2008 report: values related to the average among 2006, 2007 and 2008.

2009 report: values related to the average among 2006, 2007, 2008 and 2009.

Accidents divided by type



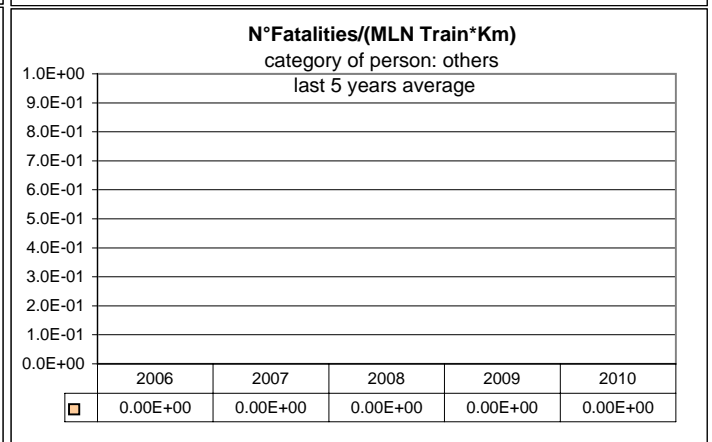
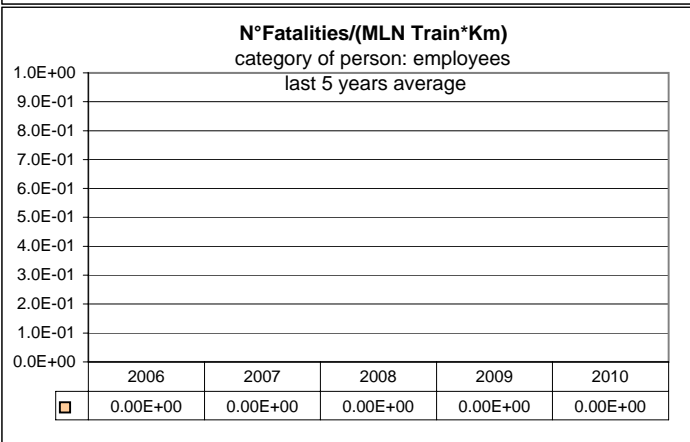
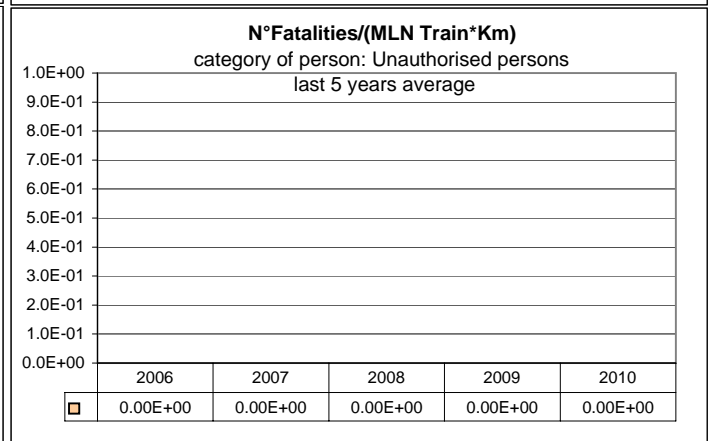
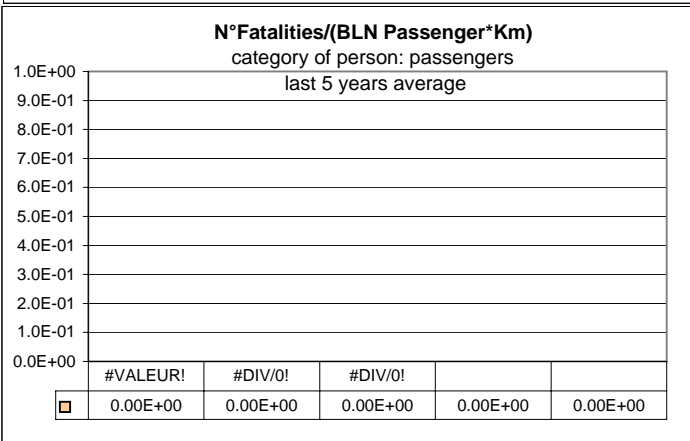
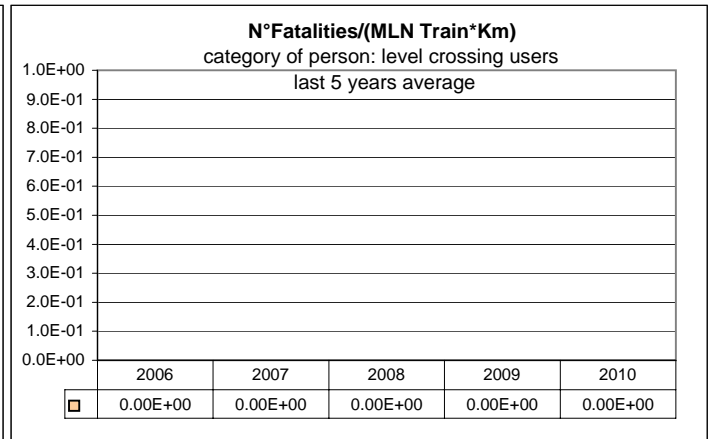
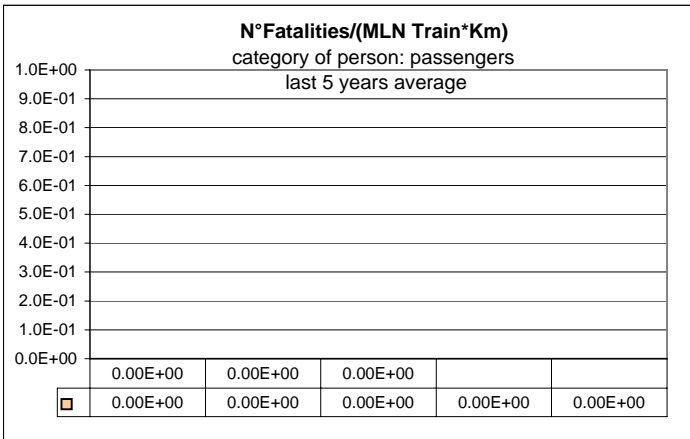
2007 report: values related to 2006.

2008 report: values related to the average between 2006 and 2007.

2008 report: values related to the average among 2006, 2007 and 2008.

2009 report: values related to the average among 2006, 2007, 2008 and 2009.

Fatalities divided by category of people involved



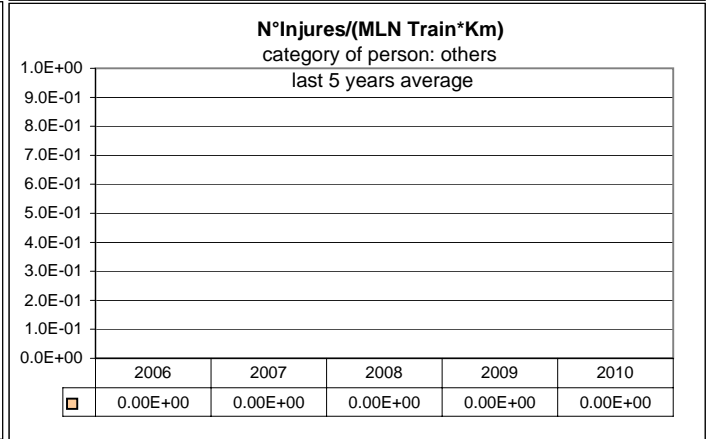
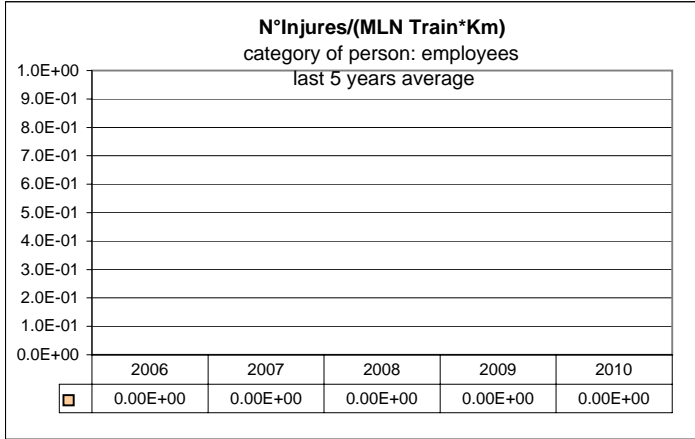
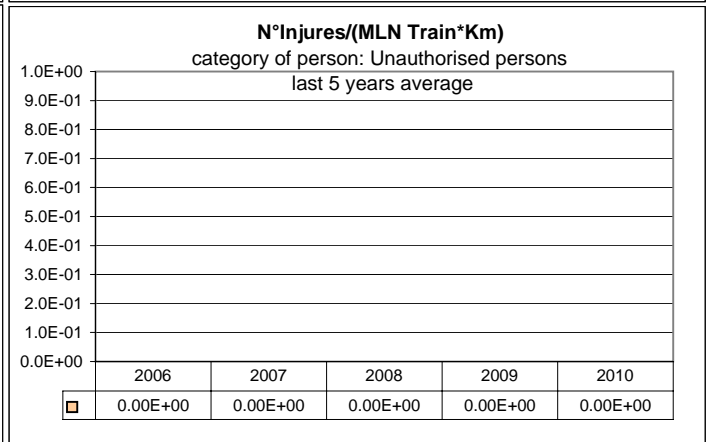
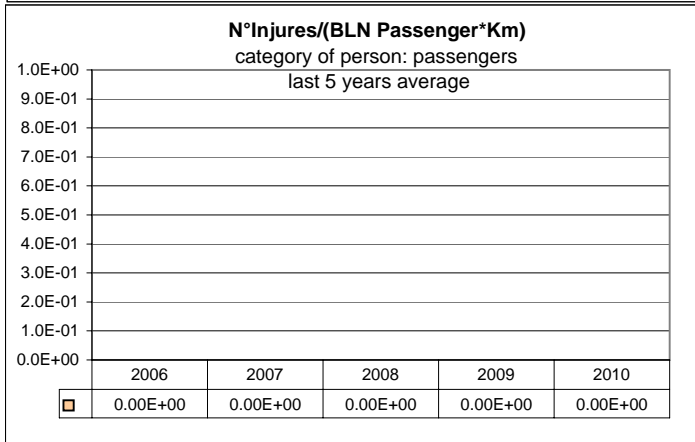
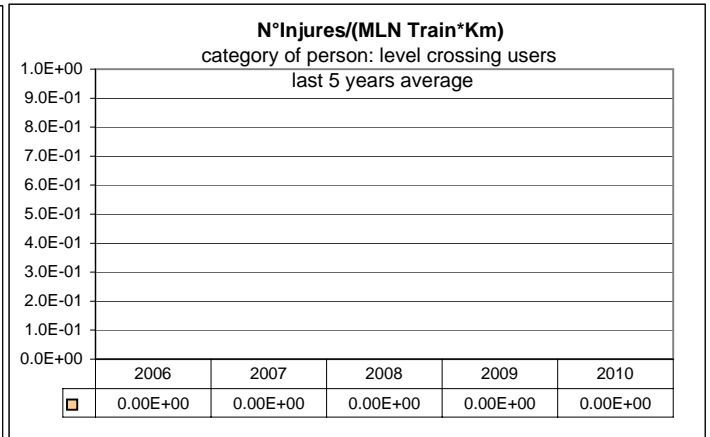
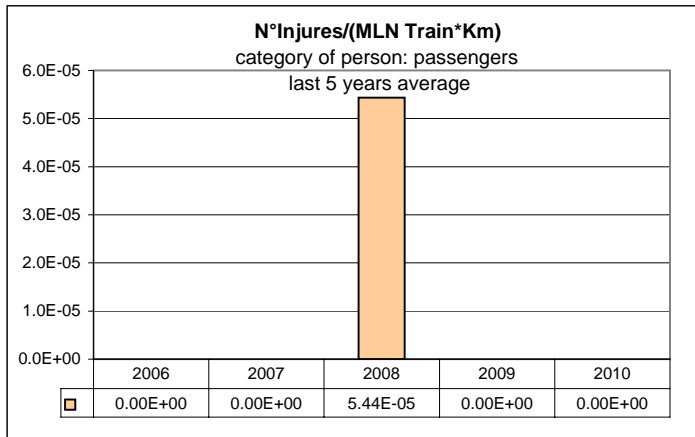
2007 report: values related to 2006.

2008 report: values related to the average between 2006 and 2007.

2008 report: values related to the average among 2006, 2007 and 2008.

2009 report: values related to the average among 2006, 2007, 2008 and 2009.

Injures divided by category of people involved



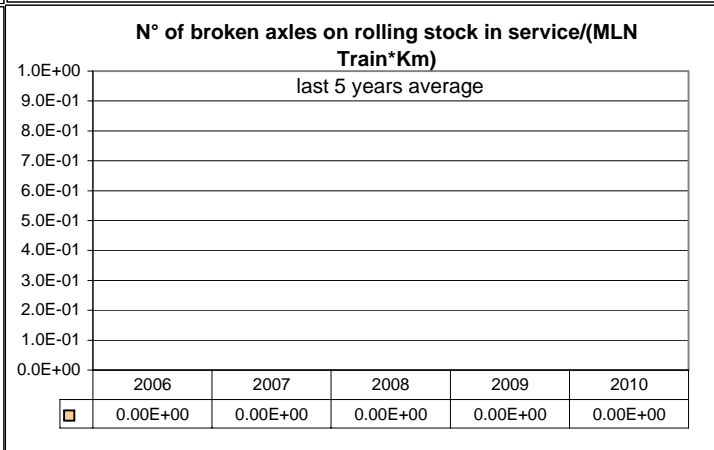
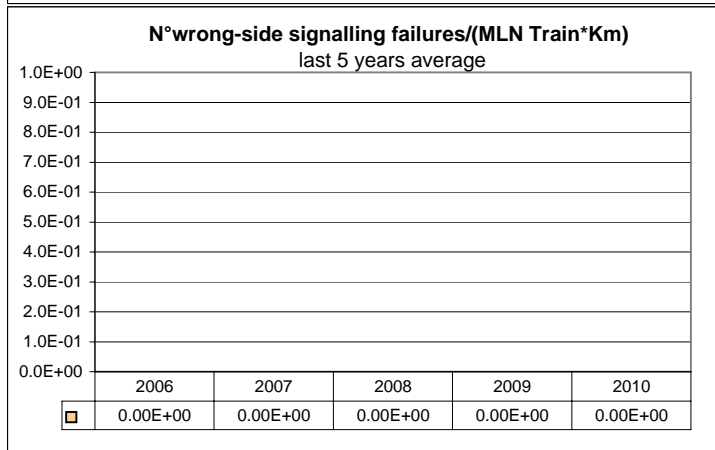
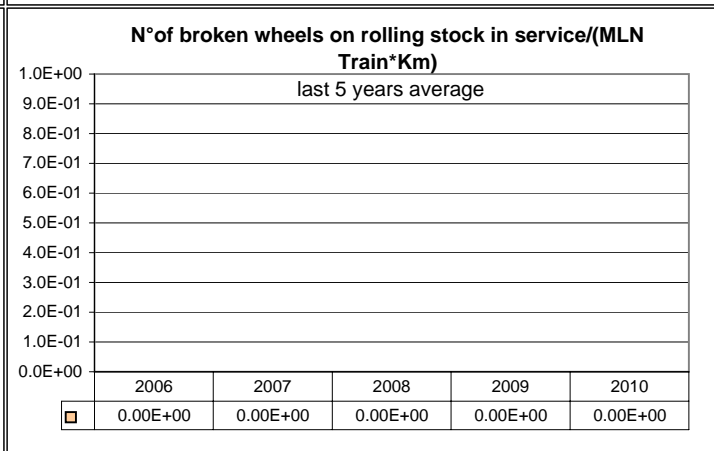
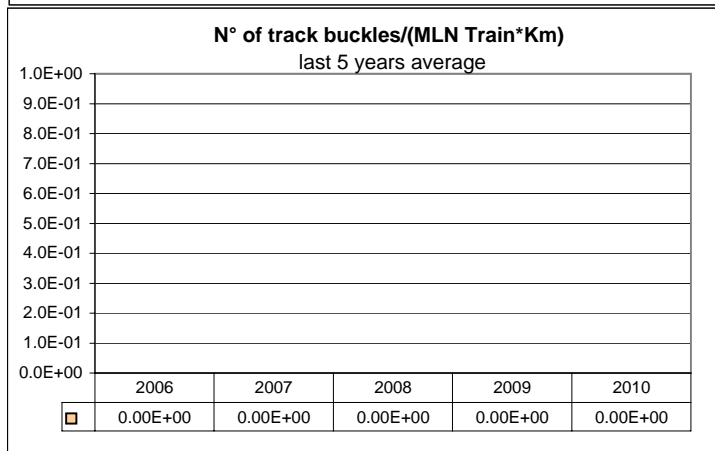
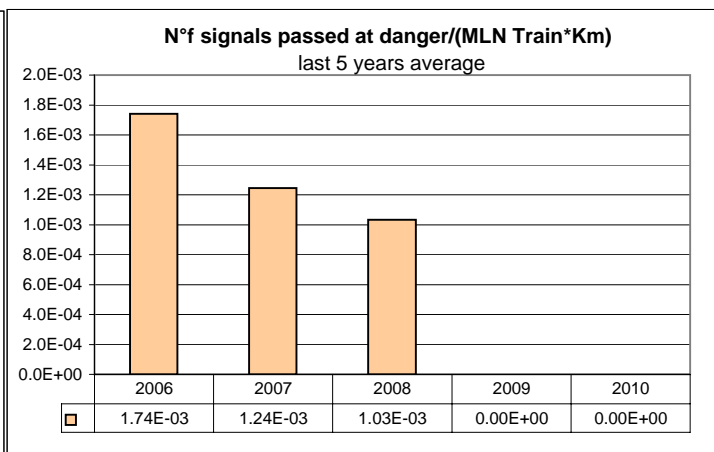
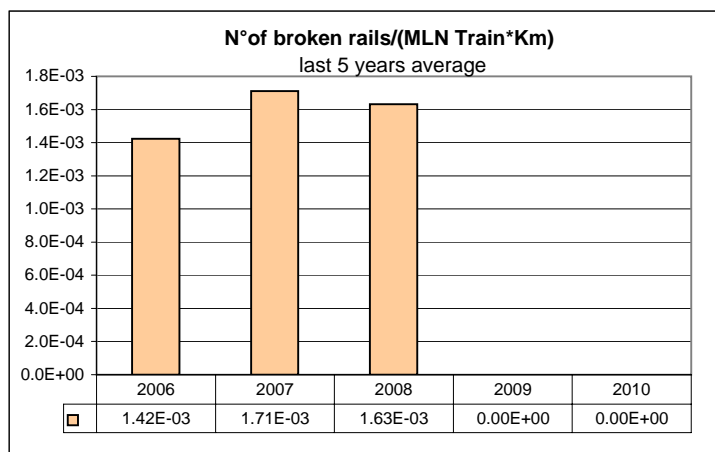
2007 report: values related to 2006.

2008 report: values related to the average between 2006 and 2007.

2008 report: values related to the average among 2006, 2007 and 2008.

2009 report: values related to the average among 2006, 2007, 2008 and 2009.

Precursors to accidents



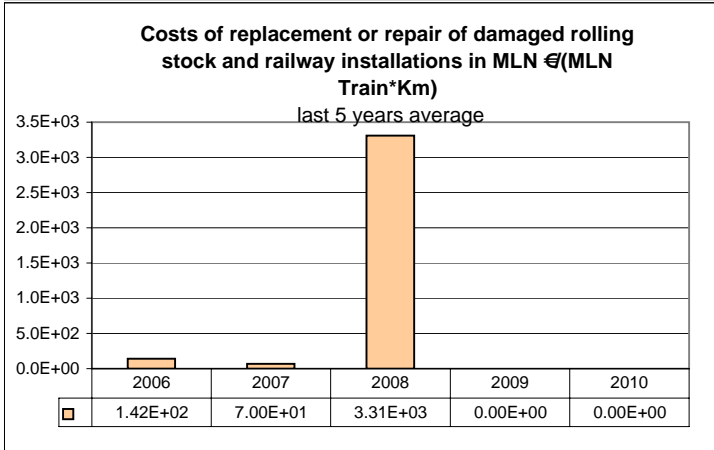
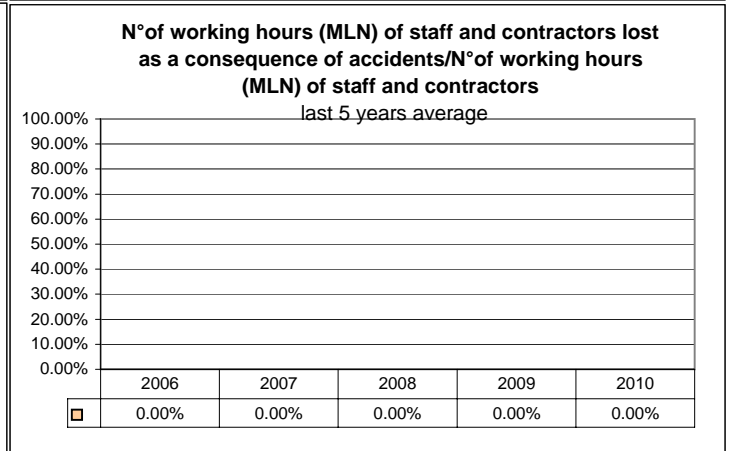
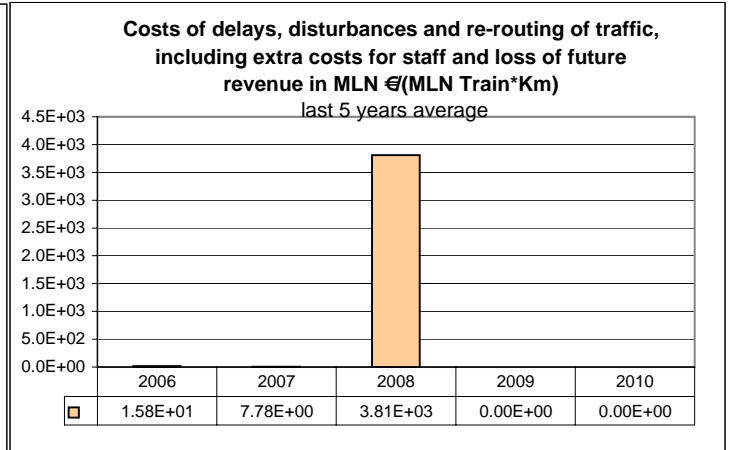
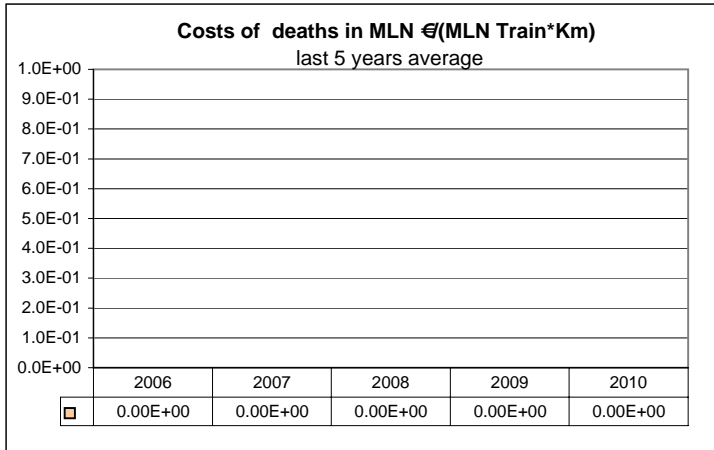
2007 report: values related to 2006.

2008 report: values related to the average between 2006 and 2007.

2008 report: values related to the average among 2006, 2007 and 2008.

2009 report: values related to the average among 2006, 2007, 2008 and 2009.

Cost of all accidents, number of working hours of staff and contractors lost as a consequence of accidents



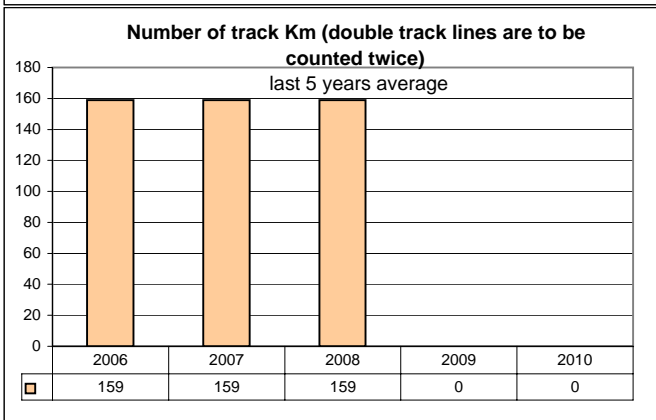
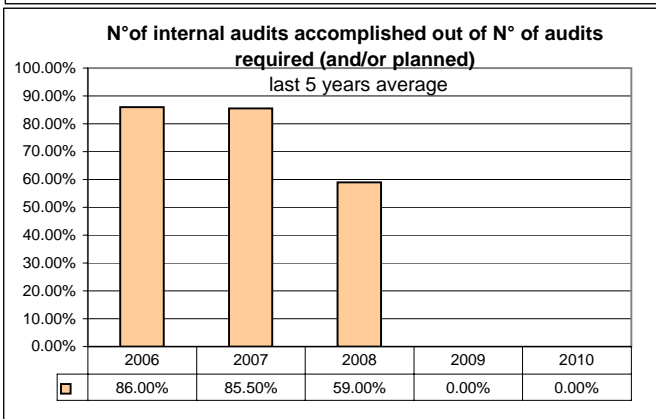
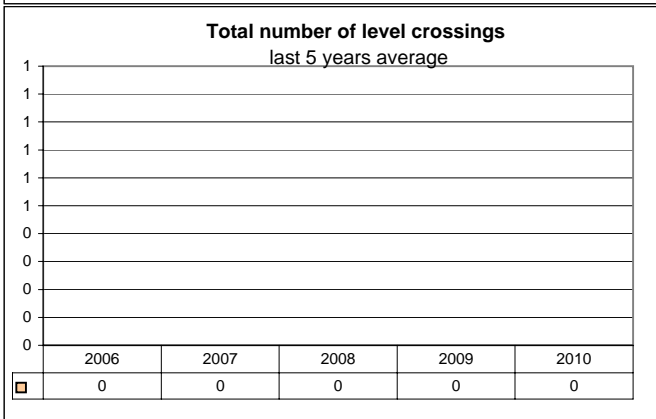
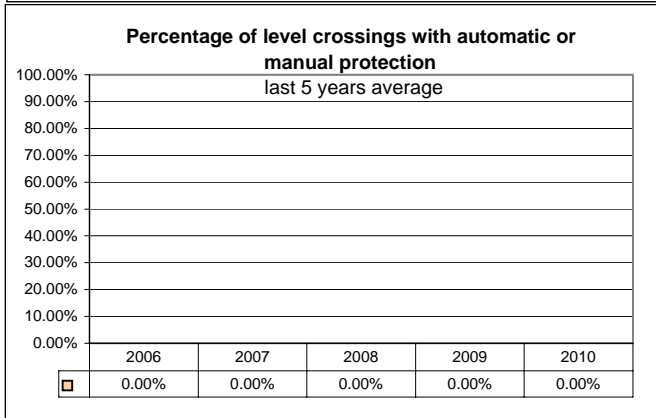
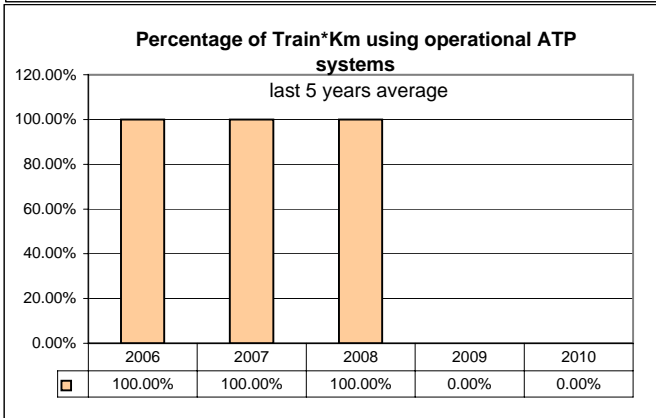
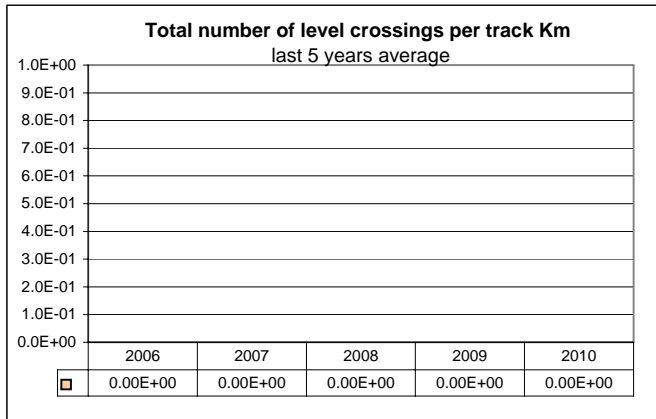
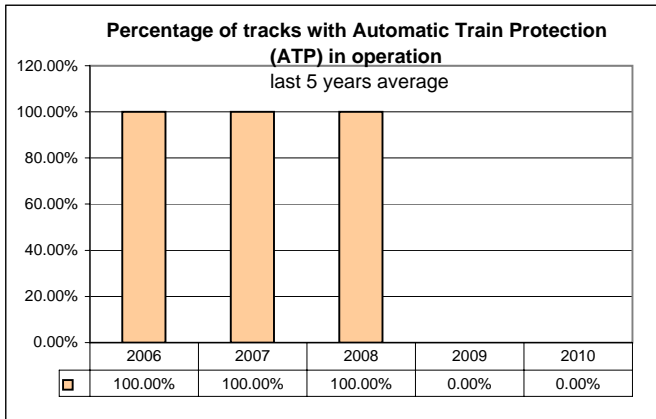
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Technical safety of infrastructure and its implementation, management of safety



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