

SEPTEMBER 2007

**REPORT BY THE CHANNEL TUNNEL
INTERGOVERNMENTAL COMMISSION
ON SAFETY IN THE CHANNEL TUNNEL
FIXED LINK DURING 2006**

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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 Tunnel Fixed Link 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 2006 to 31 December 2006.

Introductory Section

2. **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 taken advantage of 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 is also intended for anybody with an interest in the safety of the Fixed Link.

3. **Railway Infrastructure** - The railway infrastructure of the Channel Tunnel Fixed Link 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.

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

5. **Railway Undertakings** - The railway undertakings which operated trains through the Channel Tunnel Fixed Link during the period covered by this report were EWS, SNCF and Eurostar (UK) Ltd. 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.

6. **General Trends** - 2006 was the first complete year of operations under the new organisation and associated reduced staffing levels following Eurotunnel’s DARE project (“Delivering Actions to Revitalise Eurotunnel”). The IGC and the CTSA resolved to monitor the impact of the organisational changes on safety management and performance. Notwithstanding the changes the various safety indicators showed a generally satisfactory level of performance during the year. (Further information about the impact of project DARE appears at paragraph 13.)

7. **The Railway Safety Directive** – During 2006, using powers conferred upon it by the Treaty of Canterbury, the IGC worked on the development of binational regulations to implement the Railway Safety Directive (2004/49/EC) in relation to the Channel Tunnel Fixed Link. At the end of the period covered by this report the IGC was very close to reaching agreement on a final text of the regulations. However, even when the binational regulations were agreed they would not come into force until the instruments necessary to give them legal effect in both Member States had been made.

Organisation

8. 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 Fixed Link. The functions of the IGC include drawing up, or participating in the preparation of, regulations applicable to the Fixed Link. 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 9 below.

9. 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 Fixed Link. 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 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.

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

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

The Development of Railway Safety

12. **Key Events** – Key events in 2006 were the coming into operation of the new Eurotunnel organisation and staffing levels following the DARE plan and the fire which occurred on a Eurotunnel freight shuttle in the north running tunnel on 21 August 2006.

13. **DARE** – 2006 was the first complete year of operation of the Fixed Link under the new organization implemented following Eurotunnel's DARE plan ("Delivering Actions to Revitalize Eurotunnel). The new organisation involved a radical reorganization of the company, including the regrouping of safety functions within Eurotunnel's Safety and Sustainable Development Directorate, and a considerable reduction in staffing levels.

14. The IGC and the CTSA sought reassurances from Eurotunnel that the reduction in the size of the workforce and the departure of a large number of experienced staff would not lead to a lack of competence and insufficient resources in relation to safety-critical functions. More specifically, the CTSA held a meeting on Eurotunnel's site in Calais in February 2006 to provide an opportunity for discussions with Eurotunnel's divisional heads about the changes that had taken place and their implications for safety. In particular, the IGC and the CTSA wanted to be reassured that there would be no erosion in Eurotunnel's strong safety culture; that the staffing and influence of the Safety and Sustainable Development Directorate would be sufficient; and that there was sufficient capacity for emergency planning and emergency response.

15. Throughout the year the CTSA examined the impact of the changes through its monitoring and inspection programme. While the various safety indicators showed that overall performance was under control, it was suggested that Eurotunnel's social plan of 2005 may have had a demoralising effect on staff, leading to which increased numbers of workforce accidents due to a decrease in vigilance at work. Improving vigilance was identified as a main focus point for 2007, in particular adequacy of staffing levels and competence.

16. **21 August Fire** - A fire which broke out on a lorry being carried on a Eurotunnel freight shuttle was detected quickly by the detection equipment both in the tunnel and on the train. The train was brought to a controlled stop and the implementation of existing longstanding procedures ensured that all persons on board (30 lorry drivers and 4 Eurotunnel staff) were evacuated safely into the service tunnel in less than 10 minutes. The effective and efficient intervention of the emergency services extinguished the fire and limited the complete suspension of commercial services to 3 hours.

17. The fire caused no harm to any person. However, the lorry on which the fire occurred was destroyed and adjacent ones were damaged. The freight shuttle wagon was structurally damaged but, after inspection, was able to be removed from the tunnel. The copper contact wire of the overhead catenary parted and the tunnel lining was damaged to a depth of about 30mm at the crown of the tunnel over a length of about 10m.

18. As the incident occurred on the UK side of the Channel Tunnel formal investigations were launched by the Railway Accident Investigation Branch (RAIB) and Her Majesty's Railway Inspectorate (HMRI). At the end of the period covered by this report both of these investigations were continuing.

19. In addition, a Eurotunnel internal inquiry was conducted with the resulting report being transmitted to the CTSA. Debriefings conducted by the emergency services led to an action matrix being developed by the CTSA's Rescue and Public Safety Working Group. The main issues arising from these initiatives related to the efficiency and speed of response to the incident.

20. **Trend analysis** - The various safety indicators showed a generally satisfactory level of performance during the year:

- Following a downward trend during the early months of the year, passenger collective safety indicators showed a consistently improving trend reaching, by year end, a level equivalent to the best levels achieved at the end of 2004;
- Passenger individual safety indicators continued to show the same consistently improving trend observed for a number of years and reached a level never achieved before;
- On the other hand, occupational safety indicators showed a deterioration in the lost time accident frequency rate before stabilising towards the end of the year.

21. **Common Safety Indicators** – Data relating to the Common Safety Indicators as defined in the Railway Safety Directive (2004/49/EC) is at Annex C. As this is the first year that the required CSI data has been collected in that form there is no historical data to allow comparisons with previous years. Trends in CSI data will be reported in future years. Annual reports relating to safety on the Fixed Link previously published by the CTSA 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.

22. **Initiatives to maintain/improve safety performances** – Initiatives under taken during the course of 2006 were as follows:

- **SPADs** – At the end of September 2006 the CTSA expressed concerns about the number of SPADs that had occurred in recent months. The CTSA asked Eurotunnel to conduct an analysis of these incidents and to provide a suitable report. Eurotunnel responded to the CTSA in December 2006 with its detailed analysis and with a description of the action plans that it had launched to help prevent further incidents. The CTSA noted Eurotunnel's response and determined to keep the matter under review.
- **CBRN** – The CTSA continued to monitor the potential threat posed by CBRN incidents in the tunnel or on the terminals of the Fixed Link. The training of emergency personnel has taken place and joint exercises have been held. Several meetings between emergency personnel and Eurotunnel took place in order to gain a better understanding of the issues involved. Special meetings on training and on ventilation were planned for the following year.
- **Chocking of Vehicles on Eurotunnel Shuttles** – The CTSA continued to monitor the new chocking procedures that had been introduced by Eurotunnel at the end of 2005 both in relation to the effectiveness of the new arrangements and the possible risks to the health and safety of those responsible for placing and removing the chocks. Following examination of the associated procedures and in the light of a report after three months experience of operating the new arrangements, the CTSA concluded that the position was generally satisfactory but resolved to keep the matter under review.
- **Electrical Incidents** – Towards the end of the year covered by this report the CTSA expressed concern to Eurotunnel about a number of electrical incidents involving operatives which had occurred and which gave rise to concern about competence of the operatives concerned and the adequacy of procedures and supervision. At the end of the period covered by this report the CTSA was continuing to pursue these matters with Eurotunnel.
- **Nitrogen Monoxide** – The CTSA continued to pursue with Eurotunnel the implementation of measures to ensure that levels of nitrogen monoxide within the tunnels was reduced to an acceptable level.
- **Fuel Spillages** – The CTSA continued to pursue with Eurotunnel the high level of fuel spillages due to HGV vehicles hitting wheel deflectors during loading/unloading and fuel tanks being fractured. Eurotunnel informed the CTSA of the actions that it was taking to address this problem.

- **Tapis III** – Eurotunnel continued its extensive programme of work to remedy defects resulting from the deterioration of the upper track bed concrete as its interface with the sleeper blocks. The CTSA continued to take a keen interest in this matter both in relation to the effectiveness of the repairs and the occupational health and safety risks arising from the working methods. Further information on this topic is included under the section of this report dealing with “Supervision” see para 36]

- **Emergency Exercises** – As usual the IGC and the CTSA monitored carefully Eurotunnel’s exercise regime designed to test in a practical way emergency plans and procedures. During the period covered by this report the following bi-national exercises took place:
 - **Exercise BINAT 16** – BINAT 16, the annual full deployment exercise, took place during the early hours of Sunday 15 January 2006. The exercise, which involved all the emergency services of both nations, was planned around a CBRN incident on a passenger shuttle with simulation of two deliberate explosions on the single-deck rake on the French side of the tunnel. The principal objectives focussed on the bi-national response to an emergency situation involving a large number of evacuees and casualties. As with all major exercises of this type, a number of improvements were identified and carried out shortly after the exercise;
 - **VALEX** – A VALEX (Validation exercise) took place on 17 May related to the above ground response to a CBRN incident;
 - **COMEX** – A COMEX (Command Exercise) took place on 11 July related to the reception of evacuees in the passenger terminal building;
 - **VALEX** – A further VALEX took place on 7 December relating to an electrical fire in a pumping station;
 - **Exercise BINAT 17** – Although the conduct of the BINAT 17 exercise took place on Sunday 14 January 2007 and was therefore outside the period covered by this report, planning for it was concluded during 2006. The exercise was planned around an incident involving the derailment of a Eurotunnel freight shuttle leading to a number of casualties and the outbreak of two fires on carrier wagons.

Important Changes in Legislation and Regulation

23. **The Railway Safety Directive** - The most important work in relation to legislation and regulation undertaken during the course of 2006 was the development of binational regulations to implement the Railway Safety Directive (2004/49/EC) in relation to the Channel Tunnel Fixed Link. The binational regulations will transpose 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 have produced a formal agreement under which investigations relating to incidents and accidents occurring on the Fixed Link are carried out in cooperation.

24. At the end of the period covered by this report the IGC was very close to reaching agreement on a final text of the regulations. However, even when agreed the binational regulations would not come into force until the instruments necessary to give them legal effect in both Member States had been made.

25. **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 they propose be introduced. As the Concession Agreement is a binding contractual agreement these rules have a legal basis. Changes in the rules considered during the course of the period covered by this report were as follows:

- **Volume C1 “Rules Applicable by the Infrastructure Manager” and Volume C2 “Rules Applicable to Railway Undertakings” of Eurotunnel’s Safety Arrangements** – Eurotunnel made a formal submission to the IGC proposing a revision of Volumes C1 and C2 of its safety arrangements. Eurotunnel’s proposals were considered by the CTSA and comments made were taken into account by Eurotunnel. On 24 November 2006 the IGC was able to write to Eurotunnel confirming its approval;
- **Volume E “Internal Operations Plan”** – Eurotunnel made a formal submission to the IGC proposing a revised version of Volume E of its safety arrangements which includes arrangements for managing emergency situations. Eurotunnel’s proposals were considered by the CTSA and comments were made to Eurotunnel. At the end of the year covered by this report, Eurotunnel was continuing to consider the CTSA’s comments;
- **Volume F “Carriage of Dangerous Goods”** – Eurotunnel made a formal submission to the IGC proposing a revised version of Volume F of its safety arrangements and its associated annexes which set out in detail the conditions under which dangerous goods are accepted for transport on Eurotunnel’s freight shuttles and on through freight trains. Eurotunnel’s proposals were examined by the CTSA and were found to be acceptable. On 12 October 2006 the IGC was able to write to Eurotunnel confirming its approval.

26. **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:

- **Revised Safety Case of EWSI** – Under the arrangements that were in place before the requirements set out in the Railway Safety Directive (2004/49/EC), the safety cases of the railway undertakings which operate trains through the Fixed Link form supporting documents to Eurotunnel’s own safety case and, as such, are accepted by the IGC. Towards the end of 2005 Eurotunnel submitted to the IGC a revised safety case in respect of EWSI’s activities on the Fixed Link. Following examination by its experts the CTSA was able to advise the IGC that the revised safety case was acceptable. At the end of the year covered by this report, the IGC was considering its response to Eurotunnel.
- **EWS “Open Access” Safety Case** – Under the same arrangements as those described above, Eurotunnel submitted to the IGC a proposed safety case for EWS as an open access operator. The proposals were considered by the CTSA and its experts. At the end of the year the file remained open and some further information which had been requested from Eurotunnel was awaited.
- **GSM-R** – Eurotunnel has informed the IGC and the CTSA Authority of its plans to install a GSM-R communications system throughout the Fixed Link. The CTSA and its experts have engaged in discussions with Eurotunnel about this project and have developed a log of issues which will need to be properly addressed. As this project will be covered by the requirements of the Interoperability Directives these include the need to appoint a notified body at the appropriate time.
- **Carriage of “Transit Hanger” Vehicles** – At the end of 2005 Eurotunnel had consulted the CTSA on proposed changes to arrangements for carrying “transit hanger” vehicles onboard shuttles (i.e. vehicles driven by Eurotunnel and other authorised personnel who have been issued with hangers entitling them to priority passage). The CTSA commented on the proposed new arrangements which would entail such vehicles being carried onboard freight shuttles instead of tourist shuttles during busy periods.
- **90 Minute Evacuation Period** - At the end of 2005 the IGC asked the CTSA to review paragraph AI.52 of the Concession Agreement which states that:

“In the event of a train becoming immobilised in a tunnel for any reason, it must be possible to ensure that any trains in the tunnel can be brought out without delay, and that all passengers, including those from the stranded train, can reach open air within a period not exceeding 90 minutes. This arrangement shall be satisfied even if there is an interruption of power supply from one side or the other, or if there is an accident to a section of the catenary.”

The IGC’s request followed a number of incidents in which passengers were left in the tunnel for longer than 90 minutes and the fact that the period was invariably exceeded in the course of the annual bi-national exercises. The IGC endorsed the conclusions of the CTSA’s report that the wording of the paragraph was open to interpretation and, to provide clarification, suggested an interpretative text which might be included in Volume E (“Internal Operations

Plan”) of Eurotunnel’s safety arrangements. At the end of the period covered by this report this matter was still under consideration.

- **Future Design of Freight Shuttles** – During the year Eurotunnel informed the IGC that the first of its series of freight wagons (the Breda fleet) would not reach a lifespan of 30 years as originally expected. It would therefore be necessary to set up the necessary technical studies to design a new series of wagons. This work was underway at the end of the period covered by this report.

Eurotunnel also informed the IGC of problems posed by the cracking of the superstructures on second of its series of freight wagons (the Arbel fleet) and of the need to take action in the short term to prevent any accidents caused by the failure of these superstructures. Discussions about the action that it would be necessary to take were ongoing at the end of the period covered by this report. Eurotunnel had provided assurances that the wagons concerned were subject to frequent inspection and that any wagons considered to pose a risk were removed from service.

- **Minimum Operating Requirements for Emergency Centre Staffing (MOR 31)** - During 2005 Eurotunnel had consulted the CTSA on proposals to modify MOR 31 “Emergency Centre Staffing”. The intention was to give greater flexibility to the First Line of Response (FLOR) and improvements for FLOR training. During the period covered by this report it was decided that the team utilised for interventions on the French terminal would be withdrawn and any incident on the terminal would in the future be attended by the crews from Calais or other neighbouring fire stations.
- **BINAT Plan** - The Bi-national Emergency Plan which had been in place since the tunnel opened in 1994 was reviewed and considerably simplified in order to make it more operationally friendly. As the emergency services had gained a thorough knowledge of the tunnel and its environment, it was considered that the extensive descriptions and details included in the original version were no longer needed. The IGC approved the revised version of the plan in June 2006.

27. **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 played 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 was able 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. The work undertaken by the CTSA on the development of criteria to define what is a “substantial change” in railway operations was of particular importance, these criteria being more or less taken wholesale into the draft ERA guidance on “Common Safety Methods”.
- **Change Management - Handling Future Submissions** – The IGC and the CTSA had been concerned for some time about the continuing relevance of the

“Avant Projets”. These are documents which date back to the construction phase of the Channel Tunnel and define the works to be constructed and their objectives and characteristics. In the light of Eurotunnel’s view that these documents describe the system as originally built and that it would not be appropriate to make changes to them to keep them up to date, the CTSA established an Ad Hoc Working Group on Future Submissions to consider the development of alternative procedures for considering modifications to Eurotunnel’s existing arrangements and for determining when modifications are sufficiently significant to require the involvement and agreement of the IGC and the CTSA. During the period covered by this report the IGC considered a report from CTSA proposing that new procedures developed by the group should be introduced for a trial period of twelve months, with an interim report being prepared after six months and a full evaluation at the end of the trial. As indicated in the section above this work was considered to be particularly important in relation to the requirements relating to “substantial change” in the Railway Safety Directive.

- **Interoperability Guidance** – The IGC and the CTSA continued to give consideration to how projects covered by the requirements of the European Interoperability Directives would be handled in relation to the Fixed Link. On the UK side, the national regulations which implement the Directives apply to the Fixed Link with the Intergovernmental Commission acting as the “safety authority” with the function of authorising the placing into service of relevant projects. On the French side, the national regulations do not currently apply to the Fixed Link. At the end of the period covered by this report the IGC was continuing to consider how best to proceed. In the meantime, the CTSA had provided Eurotunnel with guidance and advice on how projects on the Fixed Link which were covered by the Interoperability Directives should be handled in the interim period.

The Development of Safety Certification and Authorisation

28. As the binational regulations to implement the Railway Safety Directive were not in force during 2006 no safety authorisations or certificates were issued by the IGC during that period. However, in anticipation of the regulations coming into effect, the IGC and the CTSA also gave consideration to the procedures that would need to be put in place to handle applications and the essential details against which they would be considered. These will be included in guidance on the binational regulations which will be issued by the IGC in due course. In addition, Eurotunnel and experts from the CTSA engaged in discussions about the development of Eurotunnel's SMS documentation.

29. The IGC and the CTSA also gave consideration to the notification and availability of the unified safety rules in respect of the Fixed Link in the light of the European Railway Agency's recommendation to reject the original notification made in accordance with Article 8 of the Directive.

30. In due course the IGC expects to receive an application for authorisation from Eurotunnel and applications for Part B certificates from EWS, Eurostar UK, SNCF and Europorte 2.

Supervision of Railway Undertakings and Infrastructure Managers

31. 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.

32. During 2006 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 Operational Duty Manager (ODM) reports; monthly summaries of safety events (known as “Flash Reports”), Safety Committee Minutes etc;
- Information gained from the investigation of accidents/complaints;
- Audit reports (both internal and external);
- Information from Eurotunnel concerning the interface with the railway undertakings and change management.

33. Priorities for inspection had been established based on areas identified by the CTSA’s experts during their analysis of the Eurotunnel safety case. These included:

- Competence and competence assurance;
- Audit and the adequacy of the audit programme;
- Contractor management;
- Infrastructure maintenance, particularly track and train maintenance;
- The interface with the safety cases of the railway undertakings;
- Emergency arrangements;
- Incident and accident investigation;

- Risk assessment, particularly the adequacy of risk assessments associated with change management.

34. The binational regulations to implement the Railway Safety Directive had not been finalised in time to require Eurotunnel and the Railway Undertaking to submit annual reports to the IGC. Nonetheless, all of the companies concerned submitted annual reports to the IGC on a voluntary basis by the due date. These documents were taken into account in the preparation of this report.

35. The following inspections were undertaken by the IGC/CTSA's inspectors during 2006:

- Cross-cutting Inspections on Maintenance: The theme for 2006 was Inspection of the maintenance of communication systems and competence of the staff who maintain systems;
- Inspection of the maintenance of work train locomotives;
- Inspection of revised chocking arrangements on both terminals;
- Inspection of the lighting installations of the running tunnels, service tunnel and both terminals;
- Inspection of the preventive and curative maintenance of the Engineering Management System, the monitoring indicators and the impact of Project DARE;
- Inspection of procedures and resources of track in the tunnel and impact of staff reductions on the inspection regime;
- Cross-cutting inspection 2005-2006 on maintenance of the main services;
- Inspection of the fire mains on the UK terminal;
- Inspection of the competence of the staff of various services in the event of an underground incident;
- Inspection of tourist shuttles maintenance with regard to ambient temperature (HVAC);
- Inspection of installation of new catalytic converters on Krupp locomotives;
- Various inspections of TAPIS III project (hydro-demolition / proposed method of work);
- Inspection of the training of train crews;
- Inspection of the maintenance of Service Tunnel Transport System vehicles and its communications system;
- Inspection of 'Sensitive Areas' Plant Room and Service Tunnel;
- Inspection of the Engineering Management System; and
- Inspection of UK terminal – settlement-monitoring frequency.

36. The majority of these inspections led to a number of recommendations, which were raised by the Safety Authority's Working Groups followed by a formal letter to Eurotunnel from the Safety Authority.

Some of the main conclusions and corrective measures/actions arising from the inspections were as follows:

- The Cross-cutting Inspections for 2006 concentrated on Maintenance: The Safety Authority recommended that Eurotunnel provide a six-monthly report on the changes to its key performance indicators (KPI's) relating to maintenance of the main services. Eurotunnel was asked to produce a series of trigger points to initiate senior management intervention when negative deviation from KPIs occurred. Eurotunnel was advised to address more comprehensively the health

and safety issues appertaining to maintenance activity. The final report concluded that Eurotunnel must ensure that adequate resources in terms of personnel and equipment are made available for inspections of maintenance activity.

- Service Tunnel Transport System: Eurotunnel was advised to monitor the ageing of these vehicles and act accordingly; and to pursue the control and audit of staff competence to maintain communication systems at the required level. The report recommended that a further inspection be carried out at the end of 2007;
- Training of Train Crews: The report concluded that Eurotunnel should consider reintroducing permanent training common to the First Line of Response and train crews, on a regular basis;
- TAPIS III: Eurotunnel continued its extensive programme of work to remedy defects resulting from the deterioration of the upper track bed concrete at its interface with the sleeper blocks. Several inspections were carried out relating to the methodology and health and safety of those engaged on the project. The inspection report concluded that Eurotunnel would need to check the quality of the resin implementing process and improve the control of cavity filling; to ensure that the person designated to be responsible for worksite safety effectively fulfils the functions; and for a quality control programme to be produced. Inspections would continue as the project developed.
- Track Maintenance: The inspection report on the procedures and resources of track maintenance in the tunnel and impact of staff reductions concluded that this topic should remain a priority for 2007.

Overall the inspection programme for 2006 indicated that while there was a continuing need for vigilance, the operation of the Fixed Link continued to be acceptably safe.

Conclusions

37. The safety standards achieved for the channel tunnel operation in the year 2006 were satisfactory. This is notwithstanding the serious incident that took place on 21 August, when a fire on a lorry on board a train had to be dealt with. This incident did not, however, lead to any injuries and the physical damage to the tunnel was sufficiently minor that operations could be fully restored within 24 hours. There were other incidents in 2006 that raised concerns, including some injuries to the workforce due to workplace accidents. However, the overall standards of safety achieved were acceptable.

38. Priority issues of concern that are requiring attention in the following year include:

- the continuation of action to implement the EU rail safety Directive, and to consider applications for authorisation and certification from the railway undertakings, as required by the Directive
- consideration of the outcome of and the recommendations arising from investigations into the fire of 21 August conducted by a number of bodies, including Eurotunnel, the emergency services, Her Majesty's Railway Inspectorate and the UK Rail Accident Investigation Branch
- consideration of proposals from Eurotunnel for the modification of some of their rolling stock in the light of problems arising from the ageing of the rolling stock
- consideration of other proposed changes to the safety systems for the tunnel, including proposals for the installation of a GSM-R communications system, and how these will conform to European requirements such as the interoperability Directives
- attention to proposals for further European legislation relating to the safety of railways, under discussion in the European Rail Agency
- attention to staffing levels and the competence of the workforce in respect of safety-critical operations relating to the tunnel
- attention to the health and safety of the workforce, including the avoidance of further accidents during the maintenance of electrical installations
- the maintenance of the binational emergency plan and an overall state of readiness to deal with incidents of any nature in the tunnel that may arise from accidents or from malicious acts.

Annexes

ANNEX A: Railway Structure Information

ANNEX B: IGC Structure and Relationships

ANNEX C: Data on Common Safety Indicators

ANNEX D: 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/9D386462-1F63-4625-AF20-C2279604B9B8/0/NS_20061108.pdf

Network Statement Link – French Version:

http://www.eurotunnel.com/NR/rdonlyres/FD692F25-02B7-4B4D-9B40-4964C7700BFF/0/DDR_20061108.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 alternative

Total Double/Single Length Track: 100% double track

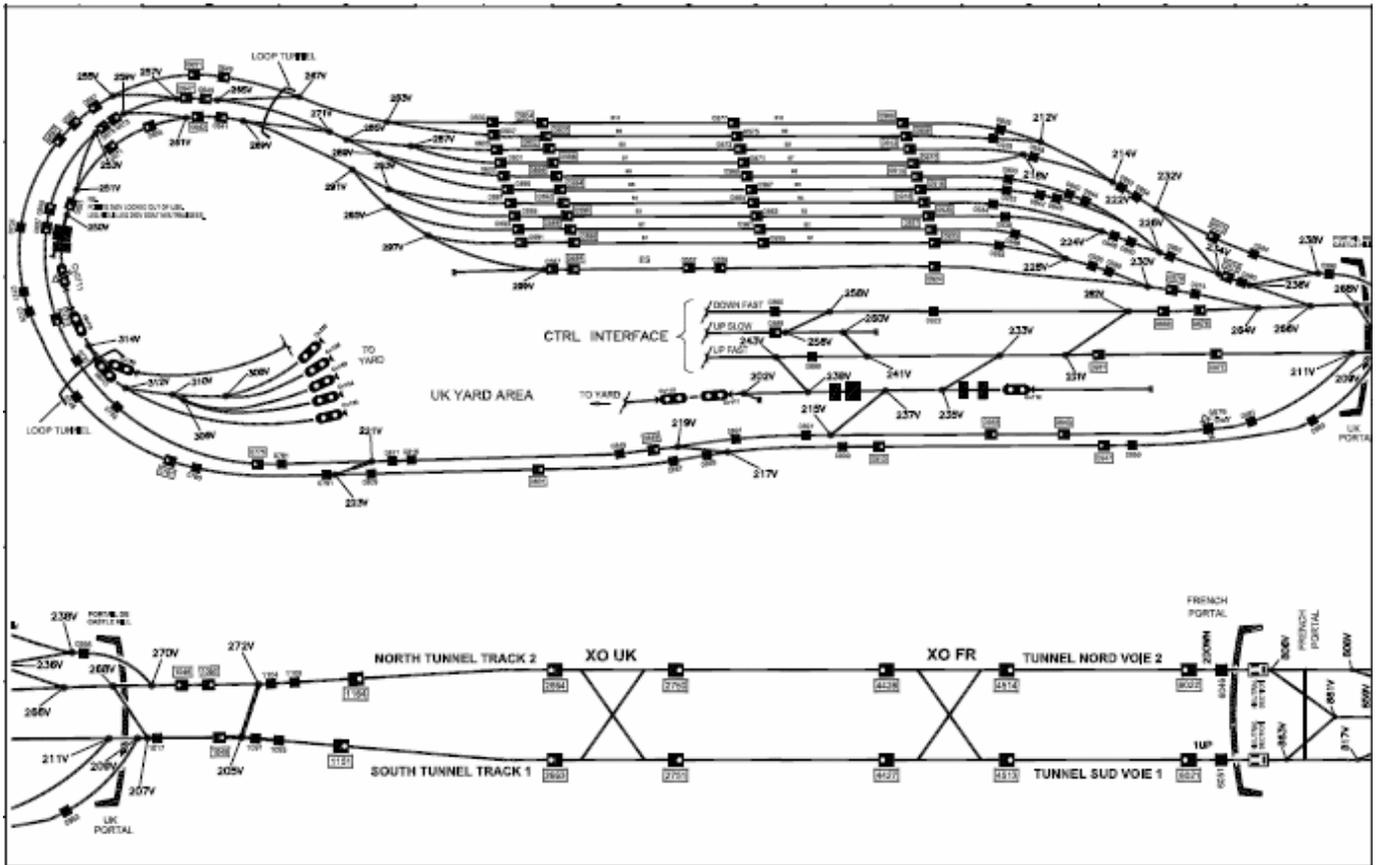
Total Track Length – High Speed Line: 108 km

Automatic Train Protection Equipment Used: TVM 430

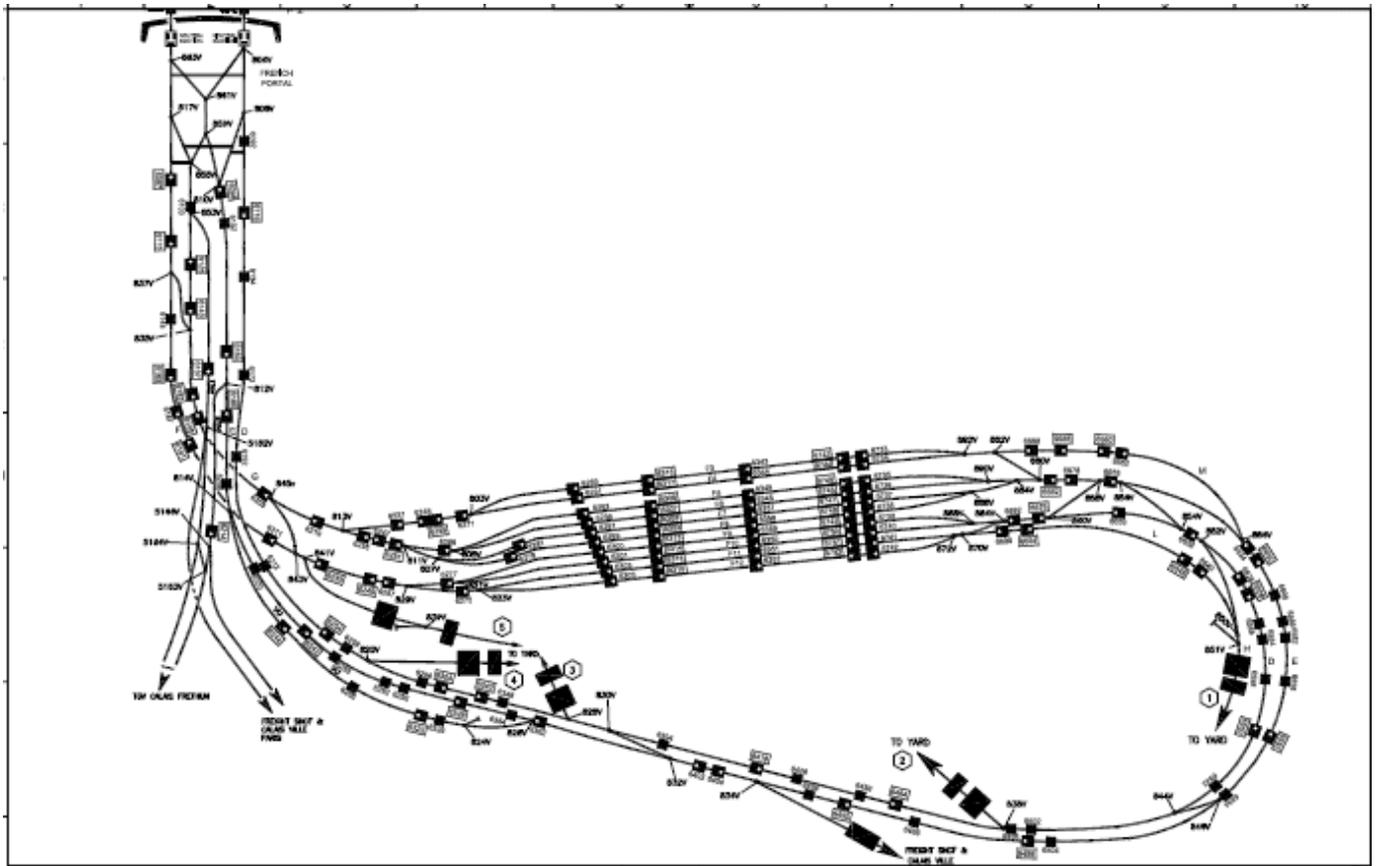
Number of Level Crossings: None on main tracks

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 2006 were as follows:

Name: English Welsh and Scottish International Ltd

Address: Lakeside Business Park
Carolina Way
Doncaster
DN4 5PN

Website: www.ews-railway.co.uk

Name: Eurostar (UK) Ltd

Address: Eurostar House
Waterloo Station
London
SE1 8SE

Website: www.eurostar.com

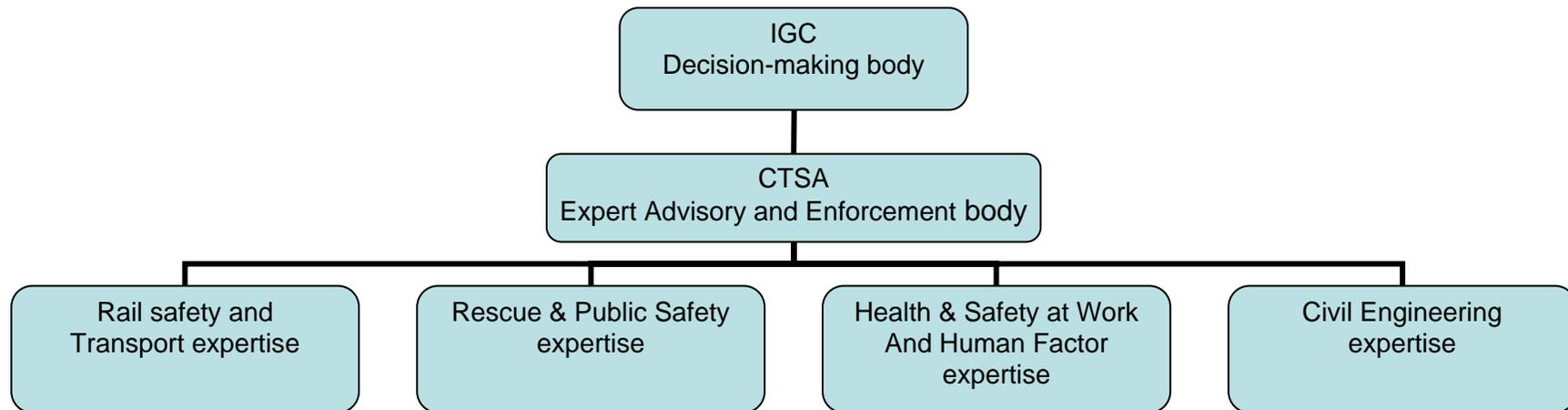
Name: SNCF

Address: 34 rue du Commandant Mouchotte
75699 Paris CEDEX 14

Website: www.sncf.com

ANNEX B1

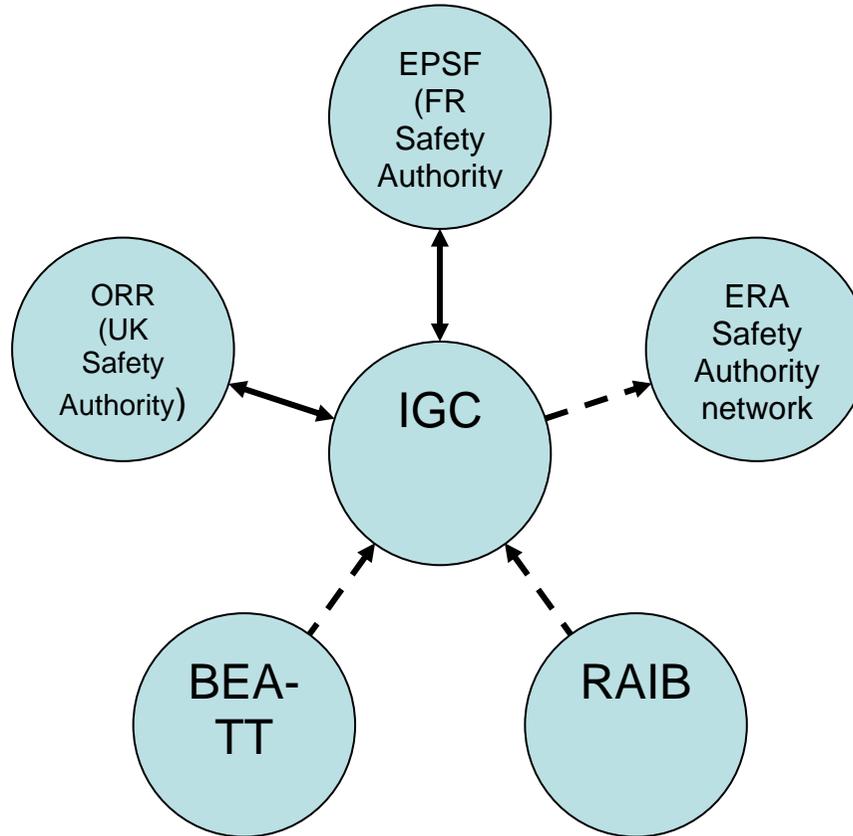
IGC STRUCTURE AND RELATIONSHIPS



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

ANNEX B2

IGC Relationships with Other Bodies



Arrows indicate main direction of communication and substantive links.

ANNEX C: DATA ON COMMON SAFETY INDICATORS

Data on Common Safety Indicators is shown on the pages that follow. [The data is contained in a separate "Excel" file]

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 2006 Eurotunnel transported 1,296,269 lorries, 2,021,543 cars and 67,201 coaches.

In addition, there were a total of 18,324 Eurostar transits.

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

Fuel Spillages	=	106
Fire Events	=	2 (See note 1)
Unscheduled stops greater than 30 minutes	=	21 (See note 2)
Track/rail problems	=	9
SPAD As (Driver)*	=	4
SPAD Bs (Technical)*	=	11
SPAD Cs (Operator Error)*	=	7
Running Tunnel Intrusion	=	1
Catenary collapse	=	1
Collision of works train with buffer	=	1
Runaway wagon	=	1 (See note 3)
Dangerous Goods Leak	=	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) The fire on an HGV Shuttle which occurred on 21 August 2006 is reported on at paragraphs 15-18 of the report. The second incident occurred on 26 July 2006 when a short circuit on an HGV shuttle amenity coach during intervention by rolling stock technicians led to a small fire which was put out using a fire extinguisher.

(2) 4 of the 21 unscheduled stops led to evacuation of HGV shuttles.

(3) An empty passenger shuttle wagon broke away in the French yard during uncoupling in high winds. The wagon was stopped by maintenance workers.

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	1	0	0	0	0	1	0

	N10	N11	N12	N13	N14	N15	N16
1.1b. "Relative" Number of accidents (per billion train km)	158.264	0.000	0.000	0.000	0.000	158.264	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	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	TS10	TS11	TS12	TS13	TS14	TS15	TS16
1.2b. "Relative" Total seriously injured (per billion 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	PS00	PS01	PS02	PS03	PS04	PS05	PS06
1.2a. Passengers	0	0	0	0	0	0	0

	PS10	PS11	PS12	PS13	PS14	PS15	PS16
1.2b. "Relative" Passengers (per billion train km)	0.000	0.000	0.000	0.000	0.000	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 billion 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 billion 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 billion 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 billion 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 billion 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 billion 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 billion 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 billion 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
1.3b. "Relative" Others (per billion 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	20	9	0	0	11	0	0

code of variable	I10	I11	I12	I13	I14	I15	I16
2.1b. "Relative" Number of incidents (per billion train km)	3 165.280	1 424.370	0.000	0.000	1 740.910	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)	€1 000 000	€0	€0	€900 000	€100 000
code of variable	C10	C11	C12	C13	C14
3.1b. "Relative" Costs (in Euros) (per billion train km)	€158 263 808	€0	€0	€142 437 427	€15 826 381

	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
code of variable	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	27	86.0%

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	6.319	See notes overleaf	See notes overleaf	1.569	159.000	3 420.715