



## **Eurostar Independent Review**

**February 12, 2010**

# **EUROSTAR INDEPENDENT REVIEW**

## **Introduction**

During the night from 18<sup>th</sup> to 19<sup>th</sup> December 2009, five Eurostar trains failed in the Channel Tunnel and passengers encountered serious problems in completing their journey to London. As a result, the Board of Eurostar decided to commission an independent review into what happened.

As the seriousness of the disruption became more apparent, the Governments of France and the UK also requested an independent inquiry.

This Independent Review was announced by the Governments of France and the UK on Monday 21<sup>st</sup> December and the following terms of references were set out.

## **TERMS OF REFERENCE FOR INDEPENDENT REVIEW**

*To review all aspects of the multiple train breakdowns in the Channel Tunnel on the night of Friday 18<sup>th</sup> December, the contingency planning and subsequent customer care over the period from Friday 18<sup>th</sup> December to Thursday 24<sup>th</sup> December.*

*To report conclusions and recommendations directly to the responsible Ministers of the UK and French Governments and, in parallel to Eurostar's shareholders, SNCF, DfT/LCR and SNCB, and to the Boards of Eurostar.*

*The Review to inquire in particular into:*

- *Eurostar's winter preparedness arrangements and the implementation of these.*
- *The technical causes of the Breakdowns and whether these should have been reasonably foreseen or prevented.*
- *The process of recovering the failed trains and their passengers from the Channel Tunnel, including the effectiveness of liaison and communications and the interface between Eurotunnel and Eurostar, and their decision-making processes, and onwards travel arrangements to passengers' destinations.*
- *The effectiveness of Eurostar's and Eurotunnel's contingency plans for trains stopped in the Tunnel.*
- *The nature and effectiveness of Eurostar's wider contingency planning for service disruption and interruption, including the practicality of alternative arrangements, the extent to which this was explored and liaison with Third Parties.*
- *The effectiveness of customer care and communication including on-board the failed trains; through to the destination station where this was not on the original train; throughout the period of disruption at stations; and directly to customers through other media.*
- *The handling of the subsequent suspension of services, passenger care during this period and the management of service resumption.*

*The review will be a joint Anglo French review led by Christopher Garnett and M. Claude Gressier. It will be independent of Eurostar and its*

*management and will be accountable to Ministers, Eurostar's shareholders and its Boards. Eurostar will fully support the review with appropriate resources, access to personnel and information.*

*The full cooperation of Eurotunnel will also be sought.*

*The review should commence as soon as possible and aim to report by the end of January 2010. Except insofar as there is a specific and demonstrable need to keep any particular elements of the review confidential for commercial reasons, the findings of the Review shall be made public.*

This report, presented by the Joint Chairmen, M. Claude Gressier and Mr Christopher Garnett, sets out their findings and recommendations. These recommendations will need to be taken forward by a number of different organisations owing to the unique structure of responsibilities in the Tunnel.

The Joint Chairmen would like to thank everybody involved in this Review - for their open and most constructive approach. Their thanks go to more than 700 people who submitted comments and feedback to the Review; to the authorities on both sides of the Channel; the other transport providers that were affected by the disruption; and most especially the Directors, Management and Staff of Eurotunnel and Eurostar.

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## **Chapter 1 Executive Summary**

*Throughout this Report all times are given in CET time, which is French time i.e. GMT +1, unless otherwise stated. Arrival times at UK stations have UK time included in brackets for clarity.*

Over the past 15 years Eurostar has developed a successful, high quality and fast service for passengers between the UK and Continental Europe. Eurostar in this period has carried over 100 million passengers and now carries over 65 percent of the air/rail market. By any account it has been a very successful passenger transport system.

When Eurostar operates well, passenger satisfaction is high. The major cause of passenger dissatisfaction relates to train reliability. Eurostar has improved the reliability of its trains from one incident per 20,000 kilometres to one per 67,000 kilometres. However, the issues of 18/19<sup>th</sup> December show that Eurostar must further improve the reliability of its trains dramatically, to minimise the potential for breakdowns, especially in winter in the Channel Tunnel.

On the night of 18/19<sup>th</sup> December 2009, snow fell in the UK, with even heavier snowfall in France. The M20 was closed, as were a number of roads and motorways in the north of France. In these conditions, five Eurostar trains travelling to the UK from Brussels, Paris and Marne-la-Vallée (Disneyland Paris) broke down in the Channel Tunnel.

The first train to fail was recovered relatively quickly. The subsequent four trains then broke down in rapid succession and passengers from two of them had to be evacuated onto Eurotunnel passenger shuttles within the Tunnel. This was the first time this had happened in 15 years of operation in the Tunnel.

In addition to organising the rescue of passengers from Eurostar trains, Eurotunnel had to deal with 1,000 cars belonging to its own passengers that were being held in the Folkestone Terminal. Some 300 cars were also held in the Coquelles Terminal along with large quantities of freight.

Whilst the rescue operation was carried out safely, passengers on all trains were delayed for a very considerable period before they arrived at their destination.

Following the train failures on the Friday night (18<sup>th</sup>), Eurostar services were suspended for three days, causing severe disruption to thousands of passengers. Over the days that followed, before Eurostar resumed a limited service on Tuesday 22<sup>nd</sup> December, over 30,000 passengers were due to travel to and from the UK by Eurostar each day.

With Eurostar now having over 65% of the passenger market, even if disruption were to occur in ideal weather conditions, it would be virtually impossible to make adequate alternative travel arrangements to accommodate all passengers. On this occasion, the adverse weather made provision of alternative transport all the more difficult. However, Eurostar

should have been better prepared for this scale of disruption and reacted earlier to try to help passengers caught up in the delays. The fact remains that Eurostar did not have a plan in place and had to improvise, and its provision of information to customers was inadequate.

In reviewing the causes of the breakdown of the trains, it has become apparent that the standard winter-weather procedures followed by Eurostar were not suited to the actual weather conditions experienced. The running maintenance procedures did not prove sufficient for the extreme winter weather conditions and not enough consideration was given to the fact that certain parts of these trains have suffered over the years. It is also clear that the design of the power cars does require high levels of ventilation whilst at the same time providing adequate protection for sensitive components, especially the electronic circuits. This has been proven to be inadequate.

In the main, the evacuation of the trains was carried out efficiently and in some cases creatively by Eurotunnel and the authorities. However, the Review has highlighted serious concerns about the procedures in the Tunnel for dealing with conditions that arise on Eurostar trains when they lose power and subsequently their air conditioning and lighting.

The Review highlights the rapid deterioration in the situation of Train 9057, the 'Disney Train'. It also addresses the subsequent delays and conditions experienced by passengers on the shuttle train on which they were evacuated.

The Review has found no reason why, even with five trains delayed in the Tunnel these could not have been evacuated in an emergency situation (which was not the case here) in a totally safe manner.

The Review also underlines Eurostar's lack of an adequate emergency plan for dealing in the UK with passengers from several broken-down trains.

21 recommendations are made in this Report, focusing on three key areas:

**1. Train reliability** - engineering improvements that Eurostar should make to enhance the reliability of its trains and prevent passengers facing a repeat of the incidents that occurred in December 2009.

**2. Evacuation and rescue** – improvements that should be made to Tunnel evacuation and rescue procedures, to ensure passengers can be transported from the Tunnel to their final destination, quickly and effectively following a breakdown, whatever its cause.

**3. Managing disruption and improving communication** – improvements that Eurostar should make to its procedures to better assist passengers and provide more effective communication in times of disruption. Eurostar should also put in place better arrangements with other organisations to provide assistance to passengers.

The full recommendations are shown in Chapter 8 and a summary of recommendations can be found in Appendix I.

These recommendations need to be taken on board and implemented principally by Eurostar, and where relevant by Eurotunnel, or by Eurostar in consultation with Eurotunnel. Those of a safety nature will need to be monitored ultimately by the Channel Tunnel Intergovernmental Commission.



## Chapter 2 Brief Summary of what happened

### Background

On the evening of Friday 18<sup>th</sup> December severe snow started to fall in the Nord/Pas de Calais area, with up to 40cm falling during the afternoon and evening, followed by severe snow storms throughout the night. The temperature overnight fell to -1.6° c. The snow resulted in the suspension of Eurotunnel services as it became impossible to load or unload the shuttles in the French Terminal for a period between 18.00 and 19.00.

The Port of Calais was closed at 00.35hrs and remained closed for cars until 07.25hrs on the Saturday, and for freight until Sunday morning. The A16 Motorway past the Eurotunnel terminal was also closed between Friday night and midday Saturday.

In Kent there was light snow throughout the evening and night, with a cold north-easterly breeze and a lowest recorded temperature of -3.4° c.

The M20 became virtually impassable by 20.00hrs owing to general conditions and the tailback of freight traffic back from the Eurotunnel site. (The situation on the M20 then remained similar until around midday on Sunday when conditions started to improve.)

In these conditions, five northbound Eurostar trains travelling from Brussels, Paris and Marne-la-Vallée (Disneyland Paris) failed in the Channel Tunnel.

The subsequent rescue effort was made more difficult by the adverse weather conditions. The emergency services in both Kent and Pas de Calais were dealing with a number of other, weather-related incidents. The ability of all parties to mobilise additional personnel in response to the breakdowns was hampered by the poor travelling conditions. The Eurotunnel and FLOR teams were, however, present and constantly available on site. The emergency services were also available whenever Eurotunnel needed to call on them.

### Train failure: sequence of events

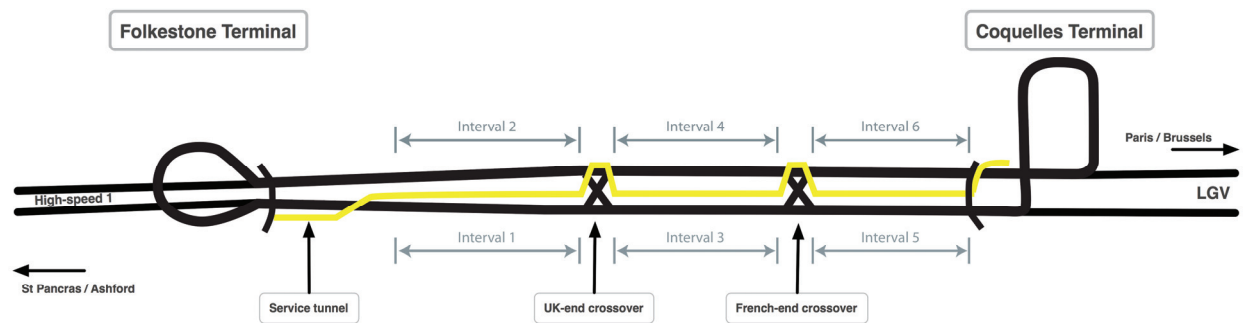
*The trains referred to in this report are identified by their train number. Those prefixed with a '9' are Eurostar trains; those prefixed with a '6' are Eurotunnel shuttles.*

The trains that broke down in the Tunnel were as follows:

- 1) 9157: the 18.59hrs service from Brussels Midi to London St Pancras
- 2) 9053: the 18.43hrs service from Paris Gare du Nord to London St Pancras
- 3) 9057: the 19.37hrs service from Marne-la-Vallée to London St Pancras (often referred to as the 'Disney Train')

- 4) 9055: the 19.13hrs service from Paris Gare du Nord to London St Pancras
- 5) 9059: the 20.13hrs service from Paris Gare du Nord to London St Pancras

*The following diagram demonstrates the lay-out of the Tunnel and provides a reference point for where each of the trains failed within the Tunnel, and how they were subsequently evacuated:*



### **Failure one: train 9157 (Brussels to London)**

At approximately 21.00hrs, train 9157 stopped in Interval 1. The train was subsequently declared a failure at 21.30hrs. It was decided to recover this train from the Tunnel using a Krupp Rescue Locomotive (Krupps), which is provided by Eurotunnel for this purpose. The Rescue Locomotive was attached to train 9157, which was on the move from the Tunnel by 22.03hrs and departed the Eurotunnel boundary at 23.01hrs. The train was then towed to St Pancras.

Following immediately after 9157 was train 9051 from Paris. This was held in the Tunnel and then diverted straight into interval 2 in the north tunnel, via the UK-end crossover. It then travelled onto St Pancras.

During the time, a number of other Eurostar and Eurotunnel services had arrived at, or were approaching, the entrance threshold to the Channel Tunnel on the UK side. These were delayed from entering the Tunnel until single line working had been put in place. This was completed by 21.49hrs and services resumed entering the Tunnel.

These trains were:

- 1) 9158: the 19.34hrs service from London St Pancras to Brussels Midi
- 2) A Eurotunnel Passenger shuttle
- 3) 9050: the 19.02hrs service from London St Pancras to Paris Gare du Nord
- 4) 9054: the 20.04hrs service from London St Pancras to Paris Gare du Nord
- 5) Two Eurotunnel HGV shuttles

Following transit of this group of trains, all of which ultimately reached their destination albeit with delays, a further group was being routed from

France towards the UK. This group commenced entry to the Tunnel at 22.05hrs and comprised of:

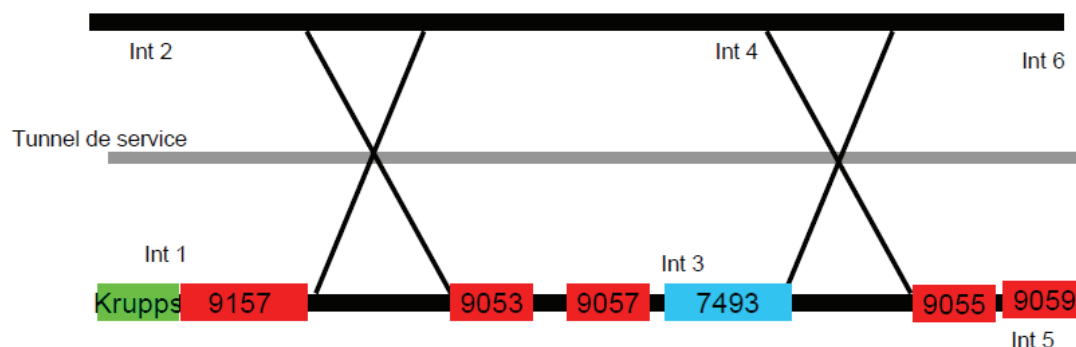
- 1) 9053: the 18.43hrs service from Paris Gare du Nord to London St Pancras
- 2) 9057: the 19.37hrs service from Marne-la-Vallée to London St Pancras
- 3) Two Eurotunnel HGV shuttles
- 4) 9055: the 19.13hrs service from Paris Gare du Nord to London St Pancras
- 5) 9059: the 20.13hrs service from Paris Gare du Nord to London St Pancras

The last of these trains entered the Tunnel at around 22.15hrs.

### ***Failure two – train 9053 (Paris to London)***

During transit of this group, train 9053 failed in tunnel Interval 3, just before the UK-end crossover, at approximately 22.40hrs. As a result, the other three Eurostar trains in this group were stopped behind the 9053.

Train 9057, which was travelling from Disneyland Paris, was held in Interval 3 in the mid-point of the Tunnel, together with an HGV shuttle (7943). The 9055 and 9059 services, which were travelling behind the Disney train, were stopped in interval 5 (see diagram below).

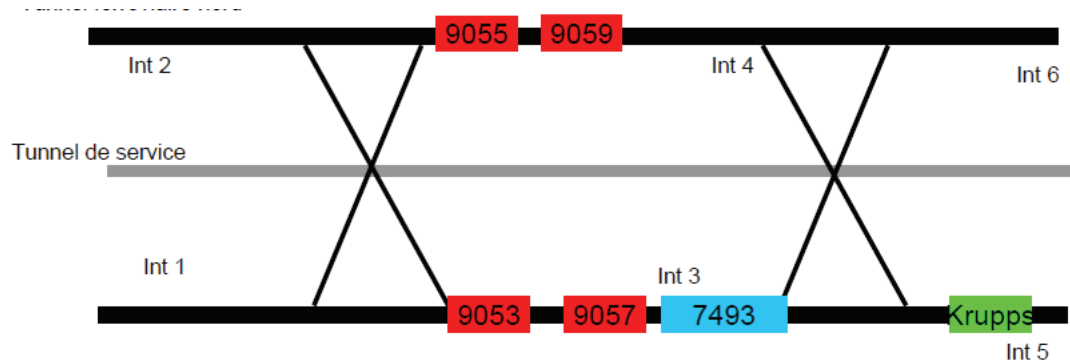


At around the same time that the 9053 train failed, train 9157 was drawn clear of the Tunnel by the Krupps and departed from the concession at 23.01hrs.

In order to recover train 9053 it was initially decided to move trains 9055 and 9059 towards the UK through tunnel Interval 4 (the north tunnel), followed by HGV shuttle 7493 and train 9057. Train 9053 would be recovered using the second set of Krupps stationed at the French end of the Tunnel.

### ***Failure three – train 9055 (Paris to London)***

During this series of moves, at approximately 23.14hrs, train 9055 came to a halt, having failed close to the UK-end crossover in tunnel Interval 4, trapping train 9059 to its rear. At this point the situation could be represented as shown below:



Train 7493 was returned to Calais and it was decided to propel train 9055 through the remainder of the Tunnel using train 9059, which was following behind.

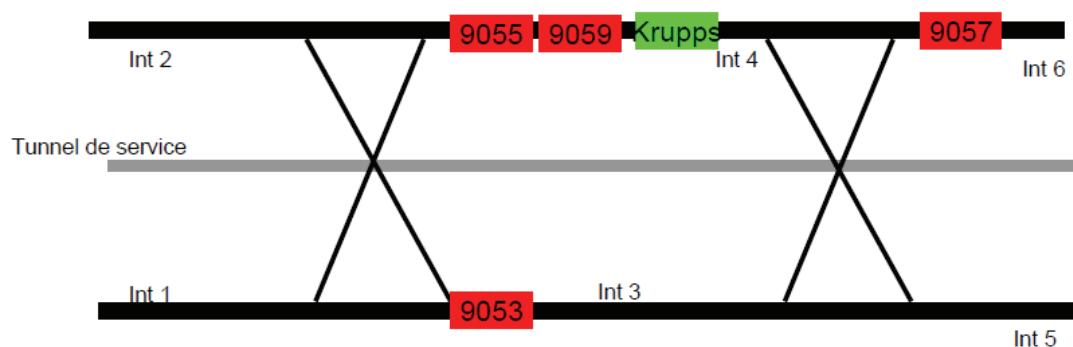
### ***Failure four – train 9059 (Paris to London)***

At 00.08hrs, however, train 9059 also failed as it moved towards train 9055. The decision was taken to assist 9059 and 9055 together using the Krupps Rescue Locomotive that had now entered the Tunnel from Calais, and was currently held in Interval 5 (with the original intention of assisting the failed 9053).

Once this recovery manoeuvre was underway, it was intended that the 9057 would return to Calais and that the 9053, whose pantograph had dropped, would instead be evacuated onto a Eurotunnel vehicle shuttle within the Tunnel.

### ***Failure five – train 9057 (Marne-la-Vallée to London)***

Finally, at 01.00hrs, train 9057 failed and its pantograph dropped while travelling through tunnel Interval 6 on its return journey to Calais. The diagram below shows trains in their final positions when four had failed within the Tunnel:

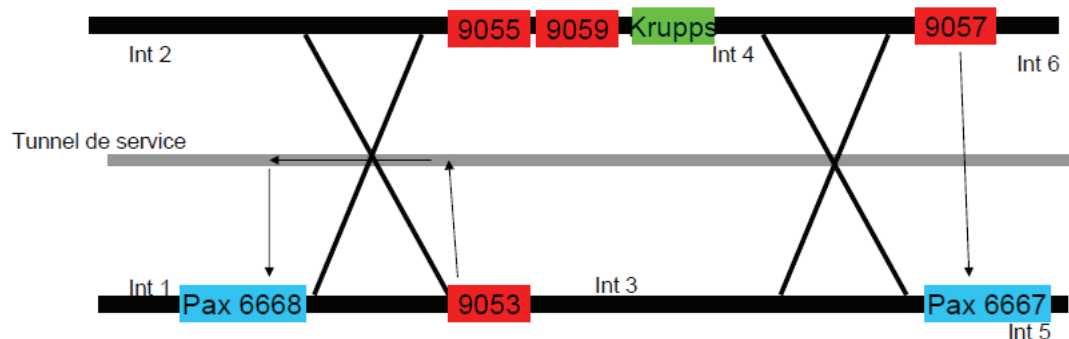


## The evacuation plan

With one train having been towed from the Tunnel towards Folkestone, four trains now needed to be recovered. The evacuation plan was as follows:

- 1) The Krupps Rescue Locomotive from Calais would 'push' the 9055 and 9059 through the north tunnel to the UK emergency sidings
- 2) Passengers from train 9053 would be evacuated onto Eurotunnel vehicle shuttle 6668 and proceed to the UK through the south tunnel
- 3) Passengers from train 9057 would be evacuated onto Eurotunnel vehicle shuttle 6667 and return to Coquelles (back through the south tunnel)

This can be represented as shown below:



Following completion of these transbordments, passengers were transported from the Tunnel. Three trains (9055, 9059 and 6668) were directed to arrive at the Eurotunnel emergency sidings at Folkestone. Shuttle 6667 (carrying passengers from the Disney train) arrived on the platform at Coquelles.

Train 6667 subsequently travelled to Folkestone once the tunnels had been cleared and a platform made available. At Folkestone, passengers transferred to one of two Eurostar trains which had been sent to Folkestone to provide onward transport to London.

Passengers eventually returned to London onboard four Eurostar services:

- 1) 9157 – Exited the Tunnel at 22.44hrs, towed by Krupps to London, arrived 00.45hrs (23.45hrs UK time)
- 2) 9088 – Relief Eurostar, arrived at the Eurotunnel platforms at 03.42hrs and finally arrived in London at 08.56hrs (07.56hrs UK time)
- 3) 9096 – Relief Eurostar, arrived at the Eurotunnel platforms at 08.09hrs and finally arrived in London at 11.53hrs (10.53hrs UK time)
- 4) 9055 – Exited the Tunnel with train 9059 at 04.00hrs. Towed by Krupps to London, arrived 14.15hrs (13.15hrs UK time)

Two trains were held outside the Tunnel in France overnight on the 18/19<sup>th</sup>. These were:

1) Train 9163, which departed Brussels at 21.09hrs. The train was held outside of the Tunnel and was not permitted by SNCF to return during the night to Brussels. It was held for nine hours, first at Hondeghe and then at Calais before returning to Brussels via Lille at 09.10hrs. It arrived in Brussels at 11.00hrs on Saturday 19<sup>th</sup>.

2) Train 9063 departed Paris at 21.19hrs. It was held outside the Tunnel and permission to return to Paris that night was refused by SNCF. It eventually left Calais at 09.00hrs on Saturday 19<sup>th</sup>, arriving in Paris at 11.20hrs.

### **Ongoing disruption**

Following the overnight disruption to services on the 18<sup>th</sup>/19<sup>th</sup> December, and in the context of ongoing poor weather conditions, Eurostar services were then suspended over the next three days. Before the decision was taken to suspend the service fully on Saturday 19<sup>th</sup>, four trains did depart that day. These were as follows:

- 1) 9030: the 14.04hrs service from London St Pancras to Paris Gare du Nord
- 2) 9137: the 13.59hrs service from Brussels-Midi to London St Pancras
- 3) 9035: the 14.13hrs service from Paris Gare du Nord to London St Pancras (failed en route, arrived 518 minutes late)
- 4) 9043: the 16.13hrs service from Paris Gare du Nord to London St Pancras (terminated at Lille and returned to Paris)

There were no trains on either Sunday 20<sup>th</sup> or Monday 21<sup>st</sup> December.

During this period, Eurostar was due to carry around 90,000 passengers. Some arrangements were made to provide alternative transport (these are described in Chapter 7); however, only a relatively small number could be accommodated on the days they were originally due to travel. As a result, many passengers experienced severe delays. Others took the decision to postpone or cancel their trip, fearing they would be unable to reach their destination before Christmas.

## **Chapter 3 Background to Tunnel safety and safety governance, including the responsibilities of Eurostar, Eurotunnel & the ICG/CIG**

### **1) Binational agreements**

The Channel Tunnel is regulated by a set of binational (French – British) arrangements that go back to the Treaty of Canterbury, signed by the two Governments on 12 February 1986. By the Treaty of Canterbury, the Governments of the French Republic and the United Kingdom undertook to allow the construction and the operation by private concessionaires of a fixed twin bored Tunnel rail link, with an associated service Tunnel, under the Channel between Cheriton in Kent and Fréthun in the Pas-de-Calais. In many of the legal texts this is referred to as the 'Fixed Link'.

The Treaty established two binational bodies each consisting of equal numbers of British and French members, the Channel Tunnel Intergovernmental Commission (IGC) and a safety committee referred to in the English version of the Treaty as the Channel Tunnel Safety Authority (CTSA) and referred to in the French version of the Treaty as the Comité de Sécurité. These two bodies came formally into being upon ratification of the Treaty, in Paris, on 29 July 1987, six days after the enactment of the Channel Tunnel Act which, inter alia, gave legal force to the Treaty in the UK.

The role of the IGC is to "supervise on behalf of the Governments all matters relating to the Fixed Link". It is thus a body representative of the two Governments.

### **2) Comité de Sécurité**

The Comité de Sécurité is an expert safety body that advises the IGC on safety matters, and has a role to ensure national and international safety laws are enforced. Article 11 of the Treaty states that the Comité de Sécurité:

- advises and assists the Intergovernmental Commission on all matters relating to safety in construction and operation of the Fixed Link;
- ensures that national and international safety law is enforced in the Tunnel;
- examines reports concerning any incident affecting safety in the Tunnel, carries out necessary investigations and reports to the Intergovernmental Commission.

Article 11 of the Treaty also confers personal responsibility, in an emergency, on the Chairman of the Comité de Sécurité or his agent, who have to take the measures necessary for safety and then report to both Governments and the Intergovernmental Commission. This power has

never been used. In France, administrative arrangements have designated the Prefet du Pas de Calais and/or his local representative, the Sous Prefet de Calais, as the rightful representative of the chairman of the Comité de Sécurité when France is chairing the committee.

### **3) Concession Agreement for commercial operations**

A Concession Agreement signed on 14 March 1986 completed the legal and financial framework of the Treaty and awarded the Concession to the limited company EuroTunnel. It indicated the general characteristics of the Fixed Link and the rules to be applied during its construction and subsequent operation. Originally planned to last 55 years, the Concession has been extended to 99 years and is now due to expire in 2086.

Commercial operations began in May 1994 with shuttle services carrying lorries and goods trains. Services for fast passenger trains - Eurostars – commenced in October 1994 and shuttle services carrying the different types of tourist vehicles (private cars, coaches, camper vehicles, minibuses etc.) were introduced gradually between December 1994 and June 1995.

Under the provisions in the Concession Agreement, when the Tunnel first opened in 1994, a set of safety arrangements and rules was proposed by the infrastructure manager, Eurotunnel, and accepted by the IGC (advised by the Comité de Sécurité). At this time, the set of European Directives and European provisions on railway safety were yet to be drafted, so the IGC had a free hand to agree safety rules for the Tunnel without reference to requirements in European railway safety law. Given the length of the Tunnel, these rules, as might be expected, include some special and specific requirements, particularly to deal with the danger of fire. In 2009 the IGC undertook a consultation exercise to review whether the specific safety rules for the Tunnel were all still required, in the light of 16 years experience of operation. The conclusions of this Review are awaited.

### **4) European railway safety Directive**

The role of the IGC in respect of safety regulation was, however, changed by the passage of the European railway safety Directive, 2004/49, which introduced a common set of safety arrangements across Europe and required each Member State to establish a national safety authority (NSA). The British and French Governments decided that the Etablissement Public de Sécurité Ferrovière (EPSF) would be the NSA for mainland France and the Office of Rail Regulation (ORR) would be the NSA for mainland Britain, but that for the Channel Tunnel and its terminals the IGC would be the NSA. The objective here, in accordance with the principles of the Treaty of Canterbury, was to ensure that the safety arrangements for the Tunnel were managed consistently as one operation.

In law, the Tunnel consists of a British half and a French half with an international frontier at the middle. However, it is a single railway operation, and it would not be sensible to have different rules for the



different ends of the Tunnel established independently. Consequently the binational IGC was designated as the safety authority, for the purposes described in the Directive, for the Tunnel. The IGC, as with its traditional role, is advised and assisted by the Comité de Sécurité in undertaking these functions.

The European railway safety Directive was implemented, for the Channel Tunnel, by a binational regulation, a set of legal provisions that came into force on the same day (which was 4 July 2008) in Britain and France. This is implemented, for the UK, by the Channel Tunnel Safety Order 2007 (SI 2007 No. 3531), and for France by the decret (Government order) 2008-748 and the law (Act of Parliament) 2008-475. The regulation sets out the roles and responsibilities of the IGC as safety authority, the Concessionaires as infrastructure manager, and the railway undertakings such as Eurostar. Thus, it is the basic text establishing in law the responsibilities of the Concessionaires and the railway undertakings.

The IGC has published a guidance document explaining and giving advice on the obligations imposed by the binational regulation.

- The regulations state, inter alia, that “the Concessionaires are responsible for the railway system and its safe operation, including the supply of materials and the contracting of services, vis-à-vis users, customers, the workers concerned and third parties” (article 13).
- They also state, inter alia, that “every railway undertaking is responsible for the safe operation of its activities on the Common Section [the Tunnel and the two terminals], including the supply of materials and contracting of services, vis-à-vis users, customers, the workers concerned and third parties” (article 14).

## **5) EuroTunnel safety requirements**

Under these provisions, Eurotunnel is required to apply to the IGC for a safety authorisation and the railway undertakings to apply for safety certification. Eurotunnel and the railway undertakings are required to prepare safety management systems (SMSs). The Eurotunnel safety management system was submitted to the IGC as the basis for its application, under the provisions in the binational regulation, for a safety authorisation. This was granted by the IGC on 7 April 2009. The railway undertakings whose trains transit the Tunnel are in the process of applying to the IGC for certification (those railway undertakings that had safety cases accepted under the safety regime that existed prior to current arrangements being introduced have “deemed authorisations” for a period). Eurostar applied to the IGC as Eurostar International Limited on 13 November 2009 and its application is currently being considered.

The establishment and maintenance of the safety arrangements and rules for the Tunnel are the responsibility of Eurotunnel. Certain of the safety arrangements, if revised, are submitted to the IGC for acceptance, in

accordance with the requirements of the Concession Agreement. There is a lower tier of safety rules and requirements that, if revised, are submitted to the Comité de Sécurité, in some cases for acceptance and in some cases for comment.

Procedures relating to the management of breakdowns of trains in the Tunnel, and arrangements for evacuation of trains if this becomes necessary, are detailed in a number of Eurotunnel documents.

## **6) Evacuation procedures**

In discussion of evacuation arrangements, attention is frequently drawn to Article A.I.52 of the Concession Agreement, which states:

"In the event of a train becoming immobilised in the Tunnel for any reason, it must be possible to ensure that any other 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 provision, dating from 1988, does not establish an obligation to evacuate passengers within 90 minutes of any train stopping in the Tunnel. It was drafted in advance of operating experience and has always been open to interpretation, particularly as to when the 90 minute period actually starts.

In 2006, following operational experience gained after real incidents and accidents, yearly exercises and discussions between the Comité de Sécurité, IGC and Eurotunnel, an interpretive paragraph was agreed for insertion into volume E of Eurotunnel's safety arrangements, which deals with emergency response. This reads:

"In the event of a train or trains becoming immobilised in the Tunnel for any reason, every endeavour should be made to enable them, and any passengers involved, to be brought, with the minimum of delay, to a place of safety where they can receive proper care, psychological support and information about the occurrence. Subject to specific provisions being implemented in case of chemical, bacteriological, radiological or nuclear incident, the Channel Tunnel service Tunnel may be considered such a place of safety. Where possible, passengers should be transported to open air within a period not exceeding 90 minutes. However, it is recognised that, according to the nature of an incident, some of the procedures implemented by the emergency response organisations, medical interventions on casualties requiring medical stabilisation before transportation, and decontamination issues, may delay the transportation of all passengers to open air beyond the 90 minute target."

## Procedures Following a Breakdown:

When a train breaks down the options are to repair the fault, tow out the train or evacuate. Normally, the first response is to send in "troubleshooters" (skilled engineers) to try to get the train moving. Towing out by a rescue locomotive is a second option, assuming a locomotive is available and the Tunnel is not blocked, at least in one direction. Given the complexity of an evacuation (managing the passengers, ensuring no-one is left behind, organising an evacuation train, counting the passengers in the service Tunnel and onto the evacuation train, onward movement of the passengers after the evacuation) a decision to evacuate should not be taken lightly, but may be necessary (for example if power is lost or if the passengers are otherwise likely to be in the train a long time). The Eurotunnel crisis management procedures suggest that evacuation should be organised if it becomes clear that passengers are otherwise likely to be stranded on the train for the 90 minute period.

Of particular importance are the procedures in the document "***Operating Principle (Level 2): Interface Principle: Document E: incident necessitating the evacuation of a railway undertaking train on the Concession (RWAY 2007 Rev.1)***". The following briefly summarises some of the principal requirements.

- The document defines the basic operating principles relating to an incident involving a train from a railway undertaking necessitating evacuation of passengers and staff. It makes clear that the first preference is that a train proceeds out of the Tunnel, and only if this is not possible other options are considered.
- Responsibilities are shared, inter alia, by Eurotunnel's Rail Control Centre (RCC), which controls the operation of the Tunnel and has oversight of the movement of trains; the driver, who is in radio contact with the RCC; the train crew, who are in radio contact with the driver and control the situation inside the train; and the FLOR (First Line of Response). The FLOR are based at emergency centres at each end of the Tunnel and are staff contracted from fire fighting organisations. They are on permanent standby to provide assistance in an incident and can proceed to the incident through the service Tunnel in specialist vehicles carrying equipment for use in an emergency.
- In a non-emergency situation, if a train is totally immobilised, a rescue train should be used to assist it out of the Tunnel. However, if the type of incident or the general situation of other trains means that it is not possible for the train to exit the Tunnel, consideration must be given to evacuating the passengers. The Rail Control Centre (RCC) Controller and driver consult and agree the evacuation strategy to be applied. The decision to evacuate is made by the RCC after consultation with the driver. Except in the case of a complete loss of communications, the train crew should not

commence the evacuation until the strategy is agreed with the RCC controller.

- Evacuation can begin when:

1- the RCC Controller, driver and train manager 1 (TM1) have consulted and been informed of the evacuation strategy to be applied;

2 - aerodynamic protection is in force, to control wind effects from the movement of trains in the opposite Tunnel, if trains are moving in the opposite Tunnel. This involves slowing the speed of trains in the opposite Tunnel and closing all the piston relief ducts, which enable air to move between the Tunnels. If a train were on fire, the ventilation system would be activated to blow fire and smoke away from passengers and crew who are evacuating;

3 - FLOR is situated next to the train and FLOR leader has been in visual contact with TM1.

- The driver must advise TM1 when he has received information that aerodynamic protection is in place. Evacuation can then commence once the FLOR has arrived at the train side. The FLOR leader approaches the train from the front and TM1 must be prepared to meet him at the first available door.
- Prior to an evacuation the train crew must make announcements to instruct passengers to leave luggage in the train. Announcements must also instruct passengers that they must, once in the service Tunnel, remain together as a group and that there may be a delay before moving, to ensure that all passengers have been evacuated. The passengers must also be advised that there may be a long walk.
- All evacuation door steps must be attended by a train crew member to assist passengers between the train step and the Tunnel walkway in order to maintain a free flow of passengers.
- The FLOR leader is responsible for passenger safety during the evacuation, from the moment the passengers leave the train.
- At the conclusion of the evacuation the TM1 carries out an internal sweep to ensure there are no passengers remaining on the train and advises FLOR when all passengers are evacuated. TM1 must also advise FLOR if a driver is remaining on the train to assist in the movement of the train, if required.
- When evacuation is complete, the driver must confirm to the RCC Controller that all passengers and staff have been evacuated to the service tunnel.

Further advice relating to the evacuation train, which takes the evacuated passengers out of the Tunnel, is included in "**Operating Principle (Level 2): Evacuation train (INFR 0019 Rev.1.)**." This document sets out the basic principles in the event of an incident requiring an evacuation train to be sent to the running Tunnel. The following briefly summarises some of the principal requirements, insofar as they add to the principles discussed above.

The document provides detail on the responsibilities of the train crew and the circumstances that may lead to evacuation. It says:

- "When a train is immobilised, the evacuation of passengers and crew has to be envisaged if the type of incident or the general situation of the trains makes assistance impossible. Passengers could become agitated in a confined space, which may lead to passengers evacuating spontaneously and being exposed to known risks in the running Tunnels. The situation on board the train therefore needs to be constantly assessed and may prompt the decision to evacuate the passengers into the service Tunnel. The crew must particularly ensure that passengers remain calm... passengers receive regular information." (See recommendation 6)
- The requirements that must be checked concerning the evacuation train are described, for example that it is capable of carrying the number of passengers involved. In the case of a Eurostar confirmation of the number of passengers on board is obtained from the Eurostar Operations Centre (COE).
- The FLOR and the TM1 must check that the number of passengers boarded tallies with the number expected. The RCC Supervisor can authorise departure of the evacuation train after confirmation from FLOR that transfer to the evacuation train is completed; confirmation that the train driver is ready to depart; checks that the CPDs have been closed are completed; and confirmation from the Eurotunnel On-Call Director (EOCD), or crisis command group or ICC/PCO, is received. Once stopped at the final destination the driver confirms his stopping point to the RCC.

Eurotunnel's arrangements for dealing with an incident are detailed in the "**Crisis Management Manual (OSRM 0404 Rev.3)**." This sets out the procedures that the Eurotunnel staff at the Rail Control Centre should follow to manage an evolving crisis and provides a road map for the Eurotunnel On-Call Director (EOCD) to manage a crisis such as a train breaking down in the Tunnel with passengers onboard. It provides a check list of actions.

- The procedures provide for the establishment of "crisis cells" to manage an incident, with a director level manager as part of the group. It states that information should be provided to customers stuck in the Tunnel, at a minimum, every 30 minutes, through the crew leader.

- It advises the EOCD “where passengers are stuck in the Tunnel”:
  - ensures that sufficient numbers of personnel are present on-board
  - ensures that adequate information is continuously broadcast
  - ensure the “comfort” situation on-board (water, toilets, lighting, temperature)
  - maintains contact with Eurostar.

## **7) BINAT**

If the incident becomes critical and additional assistance from the national emergency services is required, the binational emergency plan (known as BINAT) can be activated. This is a plan that involves the emergency response organisations in the UK and France (referred to as the Second Line of Response – SLOR) coming to the Tunnel to provide assistance. The binational plan is regularly updated and usually practiced at least once a year during the night, when the Tunnel is closed to commercial traffic and an accident is simulated to test the plan. It was last practiced on Sunday 11 January 2009. An exercise planned for 10 January 2010 was postponed due to the emergency services in Kent and the Pas-de-Calais being fully stretched dealing with the consequences of the inclement weather.

The BINAT plan defines a bi-national emergency as “any incident, actual or potential, which causes death, injury or endangers life within the Channel Tunnel system, or which causes or threatens disruption within or beyond the system and which requires or may require action by the Emergency Response Organisations in the United Kingdom and the French Republic.”

The plan involves the opening of centres to manage and control the incident, staffed by the emergency services with Eurotunnel staff at director level, in France and the UK. The French centre is referred to as the PCO and the UK centre as the ICC.

What is particularly significant about the activation of the BINAT plan (referred to as “BINAT GO”) is that members of the two nations’ emergency services on each side of the Tunnel can cross the mid-point and provide assistance to colleagues on the other side. Control of the management of the incident is assumed by the PCO or ICC, depending on who is lead nation. If the management of the incident is being led by the French control centre, these decisions are taken either by the “Prefet du Pas de Calais” or the “Sous-prefet de Calais”. Or, if the management of the incident is being led by the British control centre, the decisions will be made by the silver command of Kent Police. The RCC thereafter works under the direction of this designated control centre.

**1) Special features of the power cars**

The design of Eurostar power cars is based on other members of the TGV family, but the trains are more complex machines. They have the most powerful and sophisticated electrical systems of any TGV, but within a much smaller space than other TGVs. Given their small size (for compatibility with the British loading gauge) and low weight, they are the most powerful power cars in current use – much more so than TGV motor units, since two units pull 18 cars. In addition, all controls are electronic and fully redundant.

The main parts of a Eurostar traction system are as follows (see appendix IVa for a picture of the layout of the power car):

- a) A cabinet housing the control electronics.
- b) A transformer which steps down the voltage and supplies the common bloc.
- c) The common bloc, which is effectively a low- and high-voltage electrical substation and provides regulated supplies for the motor blocs and auxiliaries.
- d) Two motor blocs situated below the pantograph. Inductors are positioned on top of the motor blocs, immediately below the roof and very close to the roof reinforcing struts.
- e) A third motor bloc in the front section of the first car.

Because the Channel Tunnel safety committee wanted Eurostar sets to be divisible into two parts, the two motor units are independent and do not have a high-voltage connection like those of a traditional TGV. As a result, if one motor unit has no high-voltage power because its pantograph is not working, it cannot obtain this from the other pantograph, so its motors are unusable.

Because of the high installed power in the power car, it needs high-performance cooling. This is achieved by drawing in large volumes of air from outside and using powerful fans to distribute it around all the components that require cooling.

## **2) The atmosphere in the Tunnel**

The environment in the Channel Tunnel is warm and humid. The temperature in the middle, 12 kilometres from either end, is around 25°C and the air, as well as being close to total saturation, is heavily loaded with suspended particles of concrete and metal dust from the brakes of trains using the Tunnel. In winter, trains suck in large quantities of very cold outside air, sometimes containing snow, before they enter the Tunnel, which cools all the structure and components. As the cold metal comes into contact with the warm, damp and dusty air inside the Tunnel, this causes condensation. The snow melts extremely quickly, saturating those parts of the power car which it has infiltrated and causing the electronic and other components to malfunction. The warmth, damp and dust also causes arcing and short circuits.

The power cars underwent the same winterisation measures as TGVs. This mainly involved fitting screens to prevent snow from entering. These were placed inside the power car along the walls through which ventilation air passed, and others were placed higher up to protect the motor blocs. It turns out that these were not adequate to cope with the build-up of snow experienced.

## **3) Measures taken following previous incidents**

Because of their novelty and complexity, Eurostar power cars were somewhat unreliable for many years, but they have now greatly improved following numerous modifications. However, they were designed at the same time as the Tunnel was built, and the designers did not fully take into account the implications of these very specific atmospheric conditions.

Incidents have occurred in almost every severe winter since 1996:

- a) Some trains have experienced TVM signalling failure because rapid temperature changes have resulted in unreliable performance. This problem was resolved by thermally-insulating the circuits in the electronics racks of the TVM.
- b) In 2001, incidents occurred as a result of malfunctioning voltage detector circuits combined with condensation problems. All of the most critical circuits have now been modified using new technology.
- c) In 2004 and 2005, the common bloc software was modified to make the bloc warmer in winter, on the approach to the Tunnel, and thus to reduce thermal shock.
- d) There was also widespread arcing in the common blocs caused by condensation, metal dust, and the proximity of high voltage circuits to low voltage control systems. This was remedied by repositioning some of the components and using nylon bolts in at-risk areas.
- e) In early 2009, arcing was caused by resonant over-voltages occurring when power factor correction circuits were switched. A new control card was added to the common bloc to remedy this



problem, but by 18<sup>th</sup> December only 21 of the 54 power cars had been modified in this way. Three of the ten power cars immobilised in the Tunnel on that night had not been modified.

f) Electrical equipment maintenance was stepped up in order to reduce contamination which might cause short circuits.

#### **4) Incidents on 18<sup>th</sup> and 19<sup>th</sup> December**

a) Five motor blocs failed on train 9157 for the following reasons:

- Electronics failure on two blocs
- Arcing on one motor bloc inductor
- Fault on voltage detection circuit
- Over-voltage

b) Train 9053 lost traction as result of motor bloc and electronics failures.

c) Train 9057 lost three motor blocs for the following reasons:

- Electronics failure
- Arcing from an inductor
- Over-voltage

It then lost a fourth motor due to over-voltage in the power factor corrector circuits in the common blocs. This motor unit had not been modified to reduce resonant over-voltages.

d) Train 9055 initially lost one motor bloc due to arcing from an inductor. Three more then failed due to a series of similar incidents and arcing in the power factor corrector circuits.

e) Train 9059 broke down as a result of a digital data network fault.

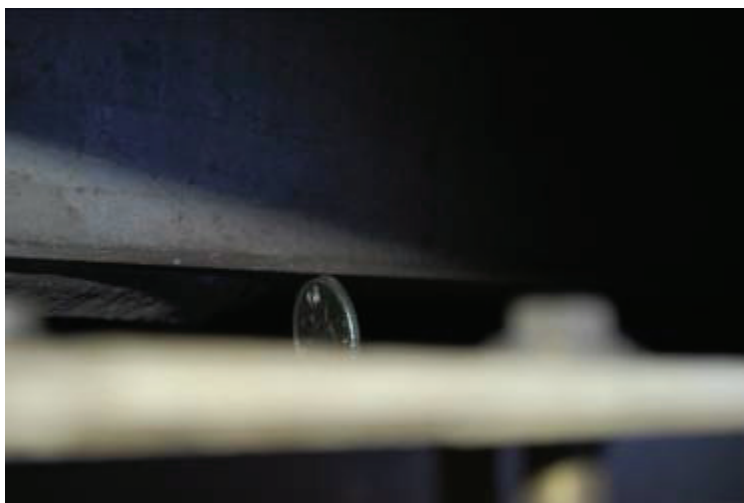
There is absolutely no doubt that these incidents were caused by a large quantity of fine snow entering the power cars and being sucked through the ventilation system to the electronic control cabinets and the electronic components of the common bloc and motor bloc. When it melted, it affected all the circuits and caused a large number of electronic failures. It is surprising that the electronic control cabinet does not have a door fitted and is open to the build-up of snow, as are some of the control electronics in the common and motor blocs.

The snow also accumulated in the pantograph well, resulting in a very cold surface above the motor blocs. This resulted in condensation falling on the inductors which caused arcing to the surrounding metal, particularly that of the roof and the reinforcing struts, which are very close to these components (see recommendation 4).

Fig 1 below shows the damage caused to the inductor as a result of its proximity to the pan well roof:



Fig 2 below shows the very limited clearance between the inductor and the pan well roof:



## **5) Winterisation procedures**

The incidents on the night of 18<sup>th</sup> to 19<sup>th</sup> December, and the tests carried out on 20<sup>th</sup> and 21<sup>st</sup> December, showed that the winterisation procedures were not suitable for the weather conditions; that routine maintenance procedures were inadequate; insufficient account was taken of the age of some parts of the power cars; and the motor units failed to combine powerful ventilation with the need for protection of sensitive components against water ingress.

The power cars of train 9057 had no snow screens, and this set encountered the most serious technical problems. Screens were not fitted on the motor blocs of train 9157. In addition, they did not cover the whole of the walls through which the ventilation air passed.

It was also possible that snow blocked the space between the louvres in the walls of the power cars and the snow filters, preventing air from passing through. As the fans are so powerful and need so much air, the air currents enter via other routes and the snow accumulated near the doors and was blown along the gangways. Drivers should be questioned and specialist external testing needs to be carried out to determine if this is the case.

It was also apparent that the power car doors were not adequately sealed and allowed large quantities of snow to enter. The same was true of the roofs, particularly around the pantograph recesses. The power cars are now around 15 years old, and the doors may have become warped, parts of the roof appear to have cracked, and the gaskets were in poor condition.

The doors of the cabinets containing the electronic components were also in poor condition, including the joints and closing mechanisms, and the motor inductors were not fully coated in glass insulating resin.

In addition, it is always difficult to carry out maintenance in anticipation of bad weather because train sets cannot be taken out of service for long periods at peak times.

Urgent measures have already been implemented in response to these incidents, and others need to be carried out before next winter. In the longer term, the design of the ventilation and cooling, and the protection of sensitive components from snow and water, needs to be reviewed.

## **6) Measures already taken**

Additional winterisation measures have already been taken, including adjusting the existing snow screens, adding new ones in sensitive areas, and adjusting the doors and covers of the electronics cabinets and racks.

Special operating measures also need to be taken in snow conditions:

- Reduce speed to 170 km an hour to avoid creating clouds of snow that can enter the motor units more easily
- Check the condition of the motor units before entering the Tunnel
- Provide temporary onboard technical support

## **7) Important additional measures to be taken before next winter**

### **a) Running maintenance (see recommendation 1a).**

- i) Carry out a detailed inventory of locations where the snow entered, and take preventive measures accordingly.
- ii) Carry out an audit to ensure that maintenance procedures are being followed correctly, and critical components are being kept clean.
- iii) Improve winterisation procedures by checking that snow screens are properly fixed and working effectively, installing additional ones if necessary, and carrying out tests to ensure that they allow air to enter.

A balance needs to be achieved between adequate ventilation and protection against snow.

iv) Check that the housing and doors are fully waterproof; examine the roof and repair.

**b) Electronics (see recommendation 1b)**

- i) Examine the causes of failures of the control and signalling electronics.
- ii) Ensure that the data communication network is functioning correctly.
- iii) Ensure that electronic components are not damaged by condensation and pollution. This includes cleaning them regularly and adding simple protection such as acrylic panels.
- iv) Check the air circulation in the control electronics cabinet.

**c) Motor blocs (see recommendation 1c)**

- i) Protect the motor bloc inductors using glass fibre or similar material.
- ii) Add a layer of high-quality insulation below the roof.

**d) Common blocs (see recommendation 1d)**

- i) Finish installing new power factor correction control cards.
- ii) Modify voltage detection circuits.
- iii) Ensure modified electronic cards have been properly completed to maintain their water resistant coating.

<p><b>8) Longer-term measures: a detailed systematic review of winter incidents, taking a wide variety of weather scenarios into account</b></p>
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Substantial changes have been made to Eurostar power cars year after year, but there does not appear to have been a comprehensive overall review asking detailed questions about these recurring incidents and looking at radical ways of preventing them. While the causes have not always been exactly the same, their occurrence should have led management to carry out such a review. It is high time that this was done in the light of all the incidents and pending a midlife assessment of the current Eurostar power cars (see recommendation 2).

It can no longer be claimed that it was 'the wrong kind of snow'. Alongside meteorologists an analysis should be conducted, looking back over the last 30 winters, including temperatures, snowfall, and types of snow.

The temperature and humidity in the Tunnel should also be examined. Eurotunnel appears to be keeping the temperature at between 25°C and 28°C using its powerful cooling system, but the risk of this being exceeded if traffic increases should also be examined.

**a) Cooling of sensitive components**

As we have already mentioned, it is surprising that electronic components of the common and motor blocs were exposed to the air, making them vulnerable to condensation, metal dust, and melting snow. Eurostar should consider using completely different ventilation and cooling methods. It should review what Eurotunnel has done with the motor units of its shuttles; how train companies in countries like Switzerland and

Japan deal with cold winters and long tunnels; and how mining and other companies can operate trains both in low outdoor temperatures and high underground temperatures.

Eurostar may also need a motor ventilation system in which outside air circulates through the motors and transformers but does not enter the rest of the motor unit. This needs to be considered for the next generation of Eurostar power cars. Electronic components may also need to be put into cabinets that are better sealed, with air circulating inside being cooled by outside air in exchangers. Eurotunnel has adopted this solution to protect the motor units of its shuttles not from snow, but from metal dust. This should be the subject of a detailed feasibility study, and could be implemented as part of the midlife train set review (see recommendation 3).

**b) Insulate the inductors and consider redesigning the roof**

As part of the midlife review, the inductor insulation should be improved in addition to all the other action required before next winter, and the possibility of raising the roof above the inductors (the pantograph well) should be investigated as a way of increasing the clearance (see recommendation 4).

**c) Consider the possibility of raising the pantograph safely and independently**

This would be very useful in ensuring that the air-conditioning continues to operate, which is an issue of safety as well as comfort, because if the temperature is too high, passengers will be tempted to open the train doors in the Tunnel.

On a TGV Réseau, the front motor unit pantographs are controlled by hard wiring, in the same way as the circuit breaker and compressor, so the driver can raise them.

The Eurostar has digital controls but there are no emergency hard wired controls. In addition, the auxiliary system, to run the train air-conditioning and lights, requires the operation of the common bloc. The possibility of making modifications to allow running the train auxiliaries, despite the failure of traction systems should be investigated. This will probably be a time-consuming process, but it needs to be carried out to minimise the possibility of passengers being left without air conditioning or lighting (see recommendation 5).

## **Chapter 5 Detailed report on all the affected trains on 18/19<sup>th</sup> December**

The summaries of events on each train are compiled from a number of sources, including Eurostar, Eurotunnel, the emergency services and passenger feedback to the Review. In interviewing passengers and reading their letters as part of the Review it was noticeable that experiences differed significantly, even for those who were on the same train. For example, two passengers gave conflicting accounts of the presence of rescue teams to assist in the evacuation of train 9057 even though they were seated only a few carriages apart. Similarly there were conflicting accounts of whether passengers heard announcements once they were on the shuttle following the evacuation.

Timings from various sources differ. However, we have information from RCC logs about the time of certain calls from the trains and this is used in the analysis that follows.

### **Friday 18<sup>th</sup> December**

Prior to the failure of the first train, 9157, the following trains had gone through the Tunnel normally:

9043 – 16.13hrs Paris to London:	entered the Tunnel at 18.29hrs
9047 – 17.13hrs Paris to London:	entered the Tunnel at 19.04hrs
9042 – 17.55hrs London to Paris:	entered the Tunnel at 18.40hrs
9044 – 18.30hrs London to Paris:	entered the Tunnel at 19.16hrs
9150 – 17.27hrs London to Brussels:	entered the Tunnel at 19.21hrs
9046 – 18.55hrs London to Paris:	entered the Tunnel at 19.42hrs
9154 – 19.35hrs London to Brussels:	entered the Tunnel at 20.09hrs

### **Train 9157**

The train departed from Brussels eight minutes late at 19.07hrs, carrying 679 passengers, and proceeded towards the Tunnel. The train had a UK crew and there were two Eurostar Managers on board, as well as the regular staff, as they were assessing the Train Managers.

During the initial part of the journey through Belgium and France there was no falling snow and no speed restrictions were imposed. However, after km post 62 it began to snow heavily and the train's speed was reduced to 230km/h.

On its approach to the Eurotunnel concession the train was slowed to a near stop before being cleared to travel through the Tunnel. The train then accelerated to 100km/h. At this point all six motor blocs were operational.

On applying power for the uphill part of the Tunnel a series of failures brought the train to a stand in tunnel interval 1 at approximately

21.00hrs. At this point the train had only one functioning motor bloc which was not sufficient to provide traction to exit the Tunnel. The driver, in communication with the RCC, made several attempts to rectify the train before declaring it had failed at 21.30hrs.

Following this (and in consultation between the driver and the RCC) it was decided to recover the failed train to London St Pancras using the Krupp recovery locomotive (Krupps) located at the Folkestone terminal. The RCC had requested an empty Eurostar be sent from St Pancras to rescue these passengers; however, Eurostar were unable to provide an empty train set and therefore the decision was taken to use the Krupps.

The decision to travel to St Pancras using the Krupp locomotives was taken as these units were not authorised to operate on Network Rail's classic infrastructure through Ashford International station (authority for this operation has since been received). Furthermore, Ebbsfleet was not seen as a suitable location for transbordment as this would require transfer across several lines to an alternative platform. This issue was further complicated by the fact that the lifts at this location were out of use for modification.

Network Rail began arranging to provide a pilot to assist with the move at 21.46hrs; however the person nominated was located at Singlewell depot. It was therefore decided at 22.00hrs to proceed to St Pancras with the Eurostar driver conducting the movement and an on board Services Manager (qualified Train Manager 2) operating circuit breakers under instruction from the conducting driver while passing through neutral sections.

While the train was at a standstill, due to the failure, the Train Managers felt that they had all the information that they needed and the PA system was working. Passenger feedback to the Review confirmed that regular announcements were made, however there was a view that the Train Manager did not appear well informed (see recommendations 10.1, 10.2, 10.3 & 10.4). The train was only in darkness briefly and kept its air conditioning but it did become very hot. The Train Manager observed high levels of condensation leading to slippery floors at some point after 22.00hrs. The conditions of the toilets were noted to be poor.

At 22.03hrs the Krupp recovery locomotives had been coupled to the failed train 9157 and it was towed out of the Tunnel.

There was the normal delay in the vicinity of the Eurotunnel / Network Rail (CTRL) boundary due to signalling problems with the Krupp's TVM equipment interfacing at the changeover. As a result three successive repère signals had to be passed at danger before the cab signalling would respond to CTRL frequencies (see recommendation 9). The train finally left the concession at 23.01hrs and arrived in St Pancras at 00.45hrs (23.45hrs GMT).

Generally the communication with passengers appeared to work well on 9157. In feedback to the Review passengers praised the staff for being

professional, efficient and polite. Refreshments, including free hot drinks, were provided and on approach to St Pancras assistance was also given about connections.

### **Train 9051**

As a result of train 9157 failing in the Tunnel there was a delay to services while single line working was put in place in the north tunnel. Train 9051, which left Paris 47 minutes late at 19.00hrs, was held immediately behind train 9157 and then routed around the failure (using tunnel interval 2). It exited the Tunnel some time between 21.40hrs and 21.45hrs.

Following 9051, six trains were despatched from Folkestone to Coquelles: three Eurotunnel shuttles and three Eurostar trains (9158, 9050 and 9054), all of which successfully reached their destinations.

At this point neither Eurotunnel nor Eurostar had any reason to believe that the failure of train 9157 was anything other than an isolated failure. Accordingly the next group of Eurostar trains was sent from Coquelles to Folkestone. The first of these was train 9053.

### **Train 9053**

The train departed Paris carrying 700 passengers at 19.35hrs, 52 minutes late due to late arrival of the set to form the service. This service was subject to the 230km/h speed restriction in northern France and arrived in the vicinity of the Channel Tunnel at around 21.30hrs.

On arrival at the Channel Tunnel the train was delayed on its approach due to the failure of 9157 ahead and was finally cleared to enter the Tunnel at 22.05hrs. The train then encountered some difficulty in traversing the Tunnel. It suffered from a number of failures before coming to a halt at 22.38hrs, just before the crossover at the UK end of interval 3.

The driver requested assistance at 23.40, but continued to attempt to regain power using standard procedures for resetting electrical equipment. At 00.12, the pantographs fell and it wasn't possible to raise them again. However, by correctly operating the CS Rad procedure (see recommendation 13.1), which controls the vital services on the train, the driver was able to maintain ventilation and emergency lighting on the train for 2 hours and 35 minutes.

In order to recover train 9053 it was initially decided to move trains 9055 and 9059 towards the UK through tunnel interval 4 (the north tunnel), followed by HGV shuttle 7493 and train 9057. Train 9053 would be recovered using the second set of Krupps stationed at the French end of the Tunnel.

This plan was subsequently amended when the pantograph on 9053 fell. As a result, the decision was taken by Eurotunnel to evacuate 9053 onto a vehicle shuttle within the Channel Tunnel, which would then transport the passengers to the Folkestone terminal. In addition, following the failure of 9055 and 9059, these trains then required the assistance of the Krupps.



According to passenger feedback to the Review, conditions on the train deteriorated significantly. There was a lack of food, water and air and it was reported that staff allowed passengers to smoke in the Tunnel (see recommendation 15.3). Passengers gave varied accounts about the staff; some appeared helpful while others were unhelpful and allegedly locked themselves away. It is clear that some staff found the pressure from the situation difficult to manage (see recommendation 11).

There was a delay of three hours between the decision to evacuate and the last person leaving the train. In part this delay was due to the time it took for the rescue shuttle to arrive. The Eurotunnel vehicle shuttle train (6668) that was to be used for the evacuation of passengers departed Folkestone at 00.46hrs, with staff onboard. It arrived close to train 9053 in the same tunnel at around 01.24hrs, ready for longitudinal transbordment. The FLOR had already arrived at 01.00hrs and at 01.35hrs evacuation started.

Although passengers were initially requested to evacuate without luggage, after some heated debate this advice was changed. The Train Manager discussed the matter with the FLOR team which did not want passengers taking bags. However, as many passengers were carrying Christmas presents in their bags they asked to take them and the Train Manager agreed. The rationale behind this decision was that it wasn't an emergency nor was it far to the rescue train (see recommendations 15.1 & 15.2). No allowance was made, however, that passengers had to go up some stairs carrying luggage which made the evacuation slower.

The evacuation was further complicated by the positioning of the train when it failed. Passengers evacuated through one door in coach one. The rescue services (FLOR team) were present helping passengers to negotiate the step between the carriage and the platform as there was a significant gap.

As the train was located close to the crossover between the two running tunnels, passengers were required to enter through a cross passage door, and negotiate up a staircase to reach the service tunnel, proceed along the service tunnel to another cross passage door through which the recovery shuttle was to be accessed. There was a distance of 375 metres between the platforms.

Passengers then boarded the shuttle. This evacuation was completed by 02.49hrs and the shuttle departed towards Folkestone at 03.20hrs, arriving at platform B3 in the terminal at 03.51hrs.

In preparation for the arrival of the shuttle, Eurostar arranged for an empty Eurostar train to travel to Folkestone to pick up passengers from 9053. Having left St Pancras at 02.00hrs, the train arrived at the boundary at 02.40hrs and onto platform B4 at 03.42hrs. There was no catering staff or food on board this train (see recommendation 17.2).

It was initially intended that the relief train (9088) would carry passengers from the Eurotunnel 6668 back to London immediately and by 04.50hrs the transfer of passengers onto 9088 was complete. However, by this point 9059 had failed within the Tunnel and there was then a debate as to whether 9088 should wait to take these passengers back to London as well. The authorities ultimately decided to keep 9088 at Folkestone.

Passengers were angry that no food, water or toilet facilities were provided at Folkestone and that they were not allowed out of the train. The doors of the shuttle remained locked, as did the doors of the Eurostar relief train, following transbordment. Passengers reported that they did not see any person in authority walking through the train to check on conditions or explain what was happening. They also claimed that that they were given little and confusing information. They could not understand, and were not told, why they were being held at Folkestone during this time (see recommendation 16.1).

The train finally departed Eurotunnel at 07.59hrs, calling at Ashford at 08.15hrs (07.15hrs GMT) and arriving at St Pancras at 08.56hrs (07.56hrs GMT).

### **Train 9057**

The train departed Marne-La-Vallée (the stop for Disneyland Paris), carrying 664 passengers, on time at 19.37hrs and subsequently called at Lille, departing there at 20.50hrs. Many English families with small children were on board and the train crew was French.

At 21.40hrs the train was held in the Coquelles area due to the failure of 9157 in the Tunnel. At 22.08hrs 9057 entered the Tunnel. During this initial passage through the Tunnel loud noises were heard by the Train Manager and passengers and the loss of two motor blocs was reported by the driver.

At 22.40hrs the train stopped in the Tunnel, behind 9053 which was experiencing traction problems. The Train Manager noted that an announcement was made to reassure passengers and water was offered.

At this point, 9057 was at a standstill in the Tunnel, behind 9053 which had failed. An HGV shuttle was to the rear of 9057 and the position of these trains had to be rearranged before it could move. During this period further faults developed within 9057. This led to the isolation of further equipment. A battery reset was required and this was conducted at 00.18hrs.

At 23.48hrs the driver was notified that due to the failure of 9053 ahead, 9057 train would return to Coquelles. This move commenced at 00.41hrs, however the driver subsequently reported "explosion type noises" and loss of further motor blocs. The train came to a stand and failed, in interval 6 at 01.00hrs. At that time the train's pantograph came down. Because the driver had not operated the CS Rad procedure correctly

(see recommendation 13.1) the train did not retain 'vital services'. 9057 lost not only its air conditioning but also ventilation and lighting.

In interviews with passengers it was apparent that the temperature inside the train rose quickly (see recommendation 14.1). Parents had to remove their children's clothes leaving them in underwear and nappies. The train was also in darkness. It was reported that some passengers suffered stress and panic attacks and that others started to feel unwell due to the heat.

The Train Manager made announcements to passengers but these were treated with a degree of distrust and many English-speaking passengers said that they could not understand the strong French accent. It was also claimed by passengers in their feedback to the Review that the crew were generally unhelpful and appeared intimidated by passengers. They ignored passengers, refused to answer questions and appeared to go into hiding.

An off-duty Essex policeman had identified himself to the Train Manager and offered help, but this was declined. At this point a paramedic from the Hertfordshire ambulance service had started administering first aid to passengers. A short time later the Train Manager requested urgent assistance from emergency services personnel aboard the train. The Essex policeman volunteered as well as two off-duty members of the British police.

The Train Manager 2 was with the driver in the cab and Train Manager 1 was working on his own with nobody from whom to seek advice. It was reported that he did not cope well and struggled with English so there were communication issues (see recommendation 12). Passengers have no recollection of seeing him walk through the train and he did not brief the catering crew to help. The off-duty Essex policeman stepped in and, according to passenger reports, took control of the situation.

As conditions in the train deteriorated, with temperatures increasing and a lack of air conditioning, a sense of urgency developed among passengers who wanted the doors to be opened. Many of these had small children who were distressed. No food or drink was offered to passengers. Throughout this time the Hertfordshire paramedic was providing medical assistance.

At 01.26hrs the driver reported to the RCC that there were major problems, on board – there was a lack of air and passengers were becoming angry. He was not able to use the radio from his own cab and had to use the telephone in the Tunnel.

A request was made by the train crew to the RCC to allow the the doors to be opened, but before authority for this was given, passengers started to open the doors themselves at 01.36hrs (see recommendation 6). The off-duty police began to offer advice and assistance in opening the doors when they saw the difficulties passengers were having. It was reported that it was difficult to read the emergency instructions (see recommendations 13.3 & 13.4). Once the doors were opened and air

started to circulate, the temperature improved in some areas (see recommendation 14.2). Some passengers chose to get off the train, a number to smoke in the Tunnel (see recommendation 15.3), although most stayed onboard.

Meanwhile, an evacuation train (Eurotunnel vehicle shuttle 6667) had left Coquelles at 01.31hrs and arrived in the south tunnel at 01.49hrs.

Although a few passengers had already disembarked the train, the official evacuation did not begin until 01.56hrs. Passengers report that no Eurostar staff were visible and that there was a lack of instruction. Passengers interviewed by the Review team conveyed different experiences on this train with some passengers saying they received help from the FLOR while others received no assistance. As on train 9053, passengers were permitted to take their baggage with them.

Because of the positioning of the train in relation to the two cross tunnels, passengers in the front coaches (nearest the UK end of the Tunnel) were directed towards the cross tunnel at the UK end of the Tunnel. Passengers walked through this passage and onto the single deck of the shuttle. Passengers in rear coaches were directed to walk through the cross tunnel at the French end and to board the bottom level of the double deck of the shuttle.

Conditions for passengers on this shuttle were poor. It was cold and passengers reported that it was dirty. All passengers, including pregnant women and small children had to sit on greasy floors or to lean against the sides of the carriage. The FLOR found it difficult to identify the Train Manager from 9057 on 6667 (see recommendations 7.7 & 7.8).

The shuttle then departed at 03.52hrs, arriving at 04.16hrs on platform F4 at the Coquelles Terminal. Whilst on route to Coquelles, three medically trained rescue staff walked through the train, checking if anyone required medical assistance.

On arrival at Coquelles, passengers were asked if they wished to leave the train, rather than wait and be transported onto London. Eleven passengers left the train at this point and were transferred to Calais Frethun to await a passenger train.

After a period of time Eurotunnel provided water and around 800 pastries to Eurostar passengers on the shuttle (this was in addition to the arrangements it was making to cater for around 1,000 of its own customers in Folkestone and around 600 in Calais). Some of this food was distributed by Eurotunnel staff throughout the carriages; however, most passengers were required to proceed along the train to collect this. Because many passengers were unfamiliar with the layout of the shuttle and hence unsure as to whether they were in the single or double deck, there was some confusion about where refreshments were being distributed (see recommendations 7.5 & 7.6).

Eurotunnel staff were available on the train to provide information, however this appeared to have been provided largely in response to passenger questions rather than through proactive announcements. Passengers were required to remain on the shuttle for a period of time prior to being allowed off in small numbers to the platform area to smoke. At this point Eurostar thought passengers were being looked after at the terminal indicating that there were issues with the communication.

During this period, the toilet facilities quickly became unpleasant. There were only 10 toilets – six in the single shuttle and four on the lower deck of the double deck shuttle. Although Eurotunnel provided some additional toilet paper, they did not clean or empty the toilets, which were overflowing (see recommendation 16.4). This led to passengers designating one carriage as an open toilet area. Passengers have no recollection of any senior member of Eurostar or Eurotunnel staff, or other authorities, other than the three medically trained FLOR staff, walking through the shuttle to see how the 650+ passengers were, or to provide explanation or instructions (see recommendation 16.1).

At 05.44hrs, the shuttle left Coquelles for the Folkestone Terminal, arriving there at 06.20hrs. Upon arrival passengers remained on the Eurotunnel vehicle shuttle for some time awaiting the arrival of a Eurostar train (9096) at 08.13hrs (see recommendation 16.2). At this point there appear to have been no announcements by authorities and passengers had no idea what was happening. Passengers' feedback to the Review states that they felt they were being held 'captive' on the train and that tempers became frayed.

The transfer of passengers to 9096 began at 08.15hrs and was then conducted via a limited number of doors. Because platforms in the Eurotunnel terminal have been constructed for use by vehicle shuttles, there was a large stepping distance between the platform and Eurostar trains, which do not normally use these platforms. To facilitate evacuation, the authorities had put in place ramps. Again passengers have no recollection of anyone in authority walking through the train to see the conditions of the passengers or explain what was happening. This transfer was completed by 09.15hrs. Women and children were evacuated first from the shuttle and were left to wait for a time outside on a platform in freezing temperatures before boarding the Eurostar train (see recommendation 16.3).

This relieving Eurostar service 9096 was loaded with the 664 passengers from 9057, together with approximately 270 people from 9059, and departed Folkestone Terminal at 10.30hrs. The Train Manager from 9057 took charge of this train and the staff from 9059 were on board, although it is reported that they locked themselves away because they were afraid of passenger unrest.

There was a subsequent delay to this train of a further 30 minutes, which finally departed the Eurotunnel / Network Rail (CTRL) boundary at 10.55hrs, arriving in St Pancras at 11.53hrs (10.53hrs GMT).

**Train 9055**

The train departed Paris 69 minutes late at 20.22hrs, carrying 639 passengers, and was further delayed by a 230km/h speed restriction on the high speed line between Paris and Calais.

Due to the failure of 9157, the train was stopped for a time on approach to the Channel Tunnel. 9055 proceeded into the Tunnel in a group which entered the Tunnel from 22.05hrs.

At 22.38hrs the train was stopped inside tunnel interval 5 due to the failure of 9053, which was blocking the Tunnel ahead. The driver informed the RCC at this time that his train was in a good state with all six motor blocs operational.

The RCC informed the driver that he would be diverted to the opposite running tunnel to continue on his journey. At 22.56hrs the train resumed its journey, crossing from tunnel interval 5 to tunnel interval 4.

A short time later there were a series of failures. The train came to a halt and requested assistance in tunnel interval 4 at 23.14hrs.

The driver followed procedures to attempt to rectify the faults on board the train and contacted the RCC, requesting them to prepare for assistance. The RCC directed the driver to undertake some remedial procedures aimed at regaining power (resetting circuit breakers in the motor blocs), however these were unsuccessful.

At 23.24hrs, the driver reported that the train still had light, ventilation and air conditioning. At 00.00hrs the pantograph dropped and the train lost its air conditioning. However, at 01.00hrs the driver managed to reset it and the air conditioning was restored.

At 23.56hrs the driver was informed that assistance would be provided from the rear by a following Eurostar train (9059).

At 00.40hrs following regular contact with the RCC to check on the location of assistance, the driver was informed that the assisting train 9059 had also failed and that he was to wait for further instructions. Shortly after this, Eurotunnel took the decision to recover both 9059 and 9055 using the Krupp recovery locomotive from the French side. The plan was to attach the Krupps to 9059, moving forward to attach to 9055, and to propel the two trains out of the Tunnel towards the Folkestone terminal. This was the first time this manoeuvre had been undertaken and the CCC is to be congratulated on taking this decision.

While awaiting recovery the driver continued attempts to rectify problems on the train while receiving updates at 01.15hrs and 02.09hrs about the progress with 9059's recovery.

At 01.11hrs the driver advised the RCC that conditions had deteriorated on the train, that passengers had become distressed and were trying to open the doors. Passenger feedback confirmed that the train became very

hot and stuffy, no food and drink was offered, toilets were not working and staff appeared to allow smoking on the train. However, the train staff were able to control the situation, and at 03.10hrs the Krupp recovery locomotive, propelling 9059, arrived at the rear of 9055. By 03.30hrs the coupling and brake tests were complete and the full formation (Krupps/9059/9055 leading) was ready to move towards the Folkestone terminal.

At 03.37hrs authority was received to proceed to the Folkestone Terminal, and the train arrived at 04.43hrs. Emergency services, the Emergency Sidings Controller (ESC) and a member of Eurotunnel staff made themselves known to the driver and the police walked through the train to check whether any passengers needed assistance.

At 05.15hrs Paramedics requested to board the train. An announcement was made to passengers to make themselves known if anyone had any problems, and the driver escorted the paramedics through the power car to passenger vehicle R1.

On arrival at Folkestone, the driver was informed that evacuation would take place on the rear train (9059) and that his train (9055) would be proceeding to London, hauled by the Krupps. However, a breakdown in communication led to passengers instead being evacuated from 9055.

At approximately 05.45hrs, doors were opened and 300 passengers disembarked from the 9055 and were transferred onto a relief train (9088) which would take them on to London.

Five coaches had also been mobilised to transfer passengers at this point, and it was decided that these would be used most effectively to carry the parties of school children from the train. A member of Eurostar staff accompanied each of the coaches. This later meant that fewer staff were available to travel on the rescue trains back to London.

At approximately 06.15hrs the evacuation finished. The driver of 9055 was then informed by the ESC that evacuation had taken place from the wrong set and that passengers would now be transferred from 9059 to 9055.

At 09.15hrs the evacuation and transfer of passengers from 9059 to 9055 had been completed and 9055's doors were closed. Uncoupling of trains 9055/9059 was undertaken following the transfer.

During the evacuation two members of SNCF train crew had made themselves known to the driver and were used to assist with subsequent moves, being positioned in the Eurostar cabs, while the driver accompanied the Krupp rescue locomotives, conducting them over Network Rail (CTRL) Infrastructure.

At 09.51hrs the train shunted to a Eurotunnel platform to await clearance to set back into the Tunnel and to proceed towards St Pancras. The train propelled into tunnel interval 2 and at 11.21hrs began its journey towards

St Pancras. Some further delay ensued due to problems with the cab signalling equipment in the Krupp recovery locomotive at the Eurotunnel / Network Rail (CTRL) boundary and also due to operation of PASSCOM equipment aboard the train. As a result the train left the concession at 12.14 (See recommendation 9).

Some passenger disturbance was experienced during the journey to Ebbsfleet, ultimately requiring police intervention. 9055 arrived at Ebbsfleet at 13.15hrs (12.15hrs UK time), with police attendance delaying its departure as police officers indicated that they would like to record names of witnesses on board.

The train arrived at St Pancras at 14.15hrs (13.15hrs UK time).

### **Train 9059**

The train departed Paris 47 minutes late at 21.07hrs, carrying 630 passengers. At 22.51hrs the train stopped briefly on the approach to the Channel Tunnel, and was cleared to enter the Tunnel at around 22.15hrs.

The train stopped in the Tunnel due to train failures ahead, and at 22.59hrs was routed through tunnel interval 4 to pass failed trains in tunnel interval 3. The train was stopped again at 23.16hrs due to the failure of 9055 in tunnel interval 4 ahead. At this time it was decided that 9059 would assist from the rear, however 9059 itself failed at 00.08hrs.

Shortly after it was reported that passengers were becoming agitated, with 25 per cent internal power available and emergency lighting only. There was also restricted ventilation and low heating. Water was offered, but only at the bar. Full lighting was subsequently restored by Eurostar engineering staff who were taken through the Tunnel to the failed train from Folkestone.

It was decided to use the Krupps to recover both 9059 and 9055 from the French side in a propelling move, first attaching to 9059, moving forward to attach to 9055 thence towards the Folkestone terminal.

The Train Manager 2 made an announcement to advise passengers that the coupling of the rescue locomotives was about to take place. This was completed and at around 02.30hrs the train started moving towards the failed 9055 ahead.

At 03.10hrs the Krupp recovery locomotives, propelling 9059 arrived at the rear of 9055. By 03.30hrs the coupling and brake tests were complete and the full formation (Krupps/9059/9055 leading) was ready to move towards the Folkestone terminal.

At 03.37hrs authority was received to proceed to the Folkestone Terminal, with the train arriving at 04.43hrs. The driver of 9055 (leading train) informed the RCC that he had arrived at Folkestone and was told that evacuation would take place on the rear train (9059) and that his train (9055) would be proceeding to London, hauled by the Krupp recovery locomotives.



There then followed some confusion about evacuation arrangements, described in more detail in the description for train 9055 above. However by 10.00hrs all passengers had disembarked from 9059 and the train was secured for later recovery to Temple Mills.

Some passengers from 9059 were transferred to 9055 which was subsequently hauled to London, arriving 14.15hrs (13.15hrs GMT); some onto buses; and some onto relief service 9096, which was also conveying passengers recovered from 9057. 9096 arrived at St Pancras at 11.53hrs (10.53hrs GMT).

### **Train 9063**

The train departed Paris at 21.29hrs, 15 minutes late, with 684 passengers onboard. It stopped in the Coquelles area on the approach to the Channel Tunnel due to the failed Eurostar trains ahead. Regular announcements were made to passengers notifying them about the delay and the Train Manager stated that the mood amongst those on board was fine.

At 01.00hrs the Train Manager was informed that the train would be returning to Paris and this was announced to passengers. Shortly after this the Train Manager received further information that only 40 hotel rooms were available in Paris once the train returned. It was planned that the rest of the passengers would remain on the train which would be kept heated in Gare du Nord.

At 02.00hrs further information was received that the train would now pass through the Tunnel rather than returning to Paris. The reason for this decision change was the refusal of SNCF's Centre National des Opérations to permit the train to return. This refusal was explained by a lack of hotel rooms close to Gare du Nord (only 40) and the understanding that because the pantograph was still up, the train was warm and comfortable (see recommendations 18.1 & 18.2).

At about this time passengers were offered free food and drink from the buffet bar with priority to children and elderly people. It was also reported that there was also some minor disruption with a door alarm and a number of drunk passengers.

At 03.45hrs the RCC informed the Train Manager that 9063 would not enter the Tunnel until 06.00hrs at the earliest and this was announced to passengers.

Passengers made a request for the doors to be opened but this was rejected. The train doors were kept locked and passengers remained on the train to preserve the 'sterile environment' required to meet customs and immigration requirements prior to entering the Channel Tunnel.

The Train Manager made himself visible and offered to answer questions, however passenger feedback to the Review claimed he did not appear to have either authority or information. Staff were generally praised by

passengers in their feedback as being polite, however it was commented that they seemed out of their depth in the difficult situation.

By 06.00hrs food and drink had run out and the crew requested further supplies. This request was declined due to road conditions in the Calais Frethun area (roads were generally impassable due to heavy snowfall).

The Train Manager was then notified that the train would be delayed in entering the Tunnel until 08.30hrs and this was announced to passengers.

From this point on, the mood amongst passengers on board changed and the Train Manager found the situation difficult. Permission was finally granted to open the doors and passengers were informed that they could leave the train to make their own way to Paris. 70-80 passengers left to join the 08.15hrs TGV service.

As this was happening the signal was given to enter the Tunnel. A number of passengers reboarded and the train prepared to move. However, the signal was changed before this could take place due to a DB Schenker train 4397 experiencing difficulties in the Tunnel.

At around 09.00hrs it was agreed that the train would return to Paris, via Lille, and it set off at around 09.20hrs. At Lille hot croissants and drinks were taken on board by station workers and the train arrived back in Paris at 11.20hrs (see recommendation 18.3).

### **Train 9163**

Train 9163 departed Brussels, 40 minutes late at 21.09hrs, due to the late arrival of stock from Forest depot. It had 511 passengers onboard.

At 23.15hrs the train stopped at the station in Hondegheem because of Eurostar failures within the Channel Tunnel.

At 00.00hrs the COE informed the Train Manager that 9163 would be returning to Lille and Brussels and asked for a headcount for both destinations to arrange hotels. At 01.00hrs, however, the Train Manager was informed that only 25 hotel rooms were available in Brussels.

Shortly afterwards the train crew was told that plans had changed and 9163 would now be going into the Tunnel. As with train 9063, the reason for this decision change was the refusal of SNCF's Centre National des Opérations to permit the train to return.

The Train Manager made an announcement to passengers and, as a result, they appeared to be understanding. The atmosphere in the train was very calm and passengers attempted to sleep.

At around 04.00hrs the RCC informed the traincrew that 9163 would not be accepted into the Tunnel before 08.30hrs. At 06.45hrs the train travelled towards the Tunnel to the station at Calais Frethun where it arrived at 07.10hrs.

The Train Manager requested permission to open the doors and announced that passengers could abandon their journey and leave at Coquelles if they wished. 14 passengers left the train via a single access door.

At around 09.00hrs it was decided that 9163 would return to Brussels and it set off at around 09.20hrs. The train arrived at Lille at 09.45hrs where croissants and drinks were provided for passengers before continuing to Brussels where it arrived at 11.34hrs.

<b>Saturday 19<sup>th</sup> December</b>
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**Train 4307**

On Saturday morning, train 4307, a DB Schenker hauled by a class 92 locomotive travelling from France to the UK, failed in the Tunnel at 08.00hrs. (More information to follow.)

Following multiple failures and associated disruption on Friday 18<sup>th</sup> December, Eurostar services were suspended on Saturday morning. It was decided at midday to run the following Eurostar services in the afternoon.

**From London St Pancras:**

- 9030 - the 14.04hrs service to Paris Gare du Nord (arrived 124 minutes late)
- 9044 - the 17.25hrs service to Paris Gare du Nord (subsequently cancelled)
- 9050 - the 19.02hrs service to Paris Gare du Nord (subsequently cancelled)
- 9148 - the 17.04hrs service to Brussels Midi (subsequently cancelled)

**From Brussels Midi:**

- 9137 - the 13.59hrs service to London St Pancras

**From Paris Gare du Nord:**

- 9035 - the 14.13hrs service to London St Pancras (failed en route, arrived 518 minutes late)
- 9043 - the 16.13hrs service to London St Pancras (terminated at Lille and returned to Paris)
- 9047 - the 17.13hrs service to London St Pancras (subsequently cancelled)

**Train 9030**

Boarding for 9030 was delayed as staff dealt with the arrival of 9055, one of the failed trains from the previous evening which arrived in St Pancras at 13.15hrs. As a result of this delayed boarding the train departed 83 minutes late at 15.27hrs.

Progress was delayed further by speed restrictions due to weather conditions in France, and 9030 arrived in Paris 127 minutes late at 19.33hrs.

**Train 9137**

9137 departed Brussels 17 minutes late at 14.16hrs. On arrival in the UK the driver reported that he had only two working motor blocs following difficulties in the Channel Tunnel. As a result it was decided to cancel the scheduled stop at Ebbsfleet and route the train straight to London St Pancras. The train arrived 40 minutes late at 15.43hrs.

**Train 9035**

Train 9035 departed from Paris 73 minutes late at 15.16hrs with a French crew and 750 passengers. During transit through the Tunnel the train experienced some difficulties. Passengers were told by an announcement that they would be "freewheeling for the rest of the journey", which caused some alarm. The train arrived on HS1 with only one working motor bloc and was travelling at 30kph. At 16.45hrs the driver requested a special stop at Ashford International. This was agreed and the stock which would have been used for cancelled 9148 was dispatched from St Pancras to transbord the passengers and take them forward to London.

9035 did not reach Ashford and failed at 17.08hrs. Due to the non availability of a conductor driver for Eurotunnel's Krupp locomotives it was decided to use 9148 which was on the way to Ashford and to proceed directly to St Pancras. The PA system was not working and there was no light or air conditioning. Water was available and the Train Manager briefed catering staff to offer this through the train, but there was a lack of food.

At 17.50hrs the units were ready to couple up but there was a further delay due to an air leak. The combined trains finally set off at 18.59hrs.

At 20.30hrs the combined trains came to a stand near Thurrock, having been slowed to permit a Southeastern service to proceed ahead.

Poor CSR reception in the area caused difficulty in communication between the driver and Ashford Signalling Centre and the main method of communication was via the Train Manager's mobile phone.

Passengers reported to the Review that there was a lack of visibility of staff and there were aggressive confrontations with passengers. There were some reports that the staff locked themselves away and passengers stated that they called the local emergency services to ask for help. The initial plan was to transbord passengers to the leading train where it had stopped, though at 21.30hrs this was changed to return to Ebbsfleet station and undertake the transbordment in the platforms. The combined trains arrived in Ebbsfleet at 22.17hrs.

As only one door from 9148 was on the platform at Ebbsfleet transbordment took an extended time. Passengers stated to the Review that they waited on the cold platform for 90 minutes during this time.

This was finally completed and the train was left Ebbsfleet at 23.49hrs arriving at St Pancras at 00.07.

### **Train 9043**

Train 9043 departed 27 minutes late from Paris at 16.40hrs with 650 passengers onboard.

As the train was en route it was decided to suspend services through the Channel Tunnel due to difficulties experienced in the Tunnel by earlier trains.

The decision was taken to return the train to Paris via Roissy where a number of hotel rooms would be made available. The Train Manager requested authorisation from the COE to allow passengers for Calais Frethun to disembark at Lille, where the train was due to stop before returning. This request, however, was refused after consultation with Lille station to ensure the "sterile environment" of the train met customs and immigration requirements.

At 18.10hrs the train departed Lille heading to Paris via Roissy where hotel rooms would be allocated to passengers.

The train arrived at Roissy at 19.05hrs and the doors were opened to allow passengers access to the platforms. They were informed that staff would meet them to organise hotel requirements and a number of passengers who wanted to travel to Lille on a TGV service were able to do so. The passengers were reported to have become aggressive at this point.

The train was held at Roissy until all passengers requiring hotel accommodation had been allocated a room, so none were left stranded. As a result the train did not depart until 21.40hrs. It arrived back in Paris at 22.07hrs where food and drink was provided.

### **Trains 9044, 9050, 9148 and 9047**

These services were cancelled prior to departure as a result of difficulties experienced with earlier services.

<b>Summary of some issues common to a number of trains</b>
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It was widely reported by passengers across the trains that there was smoking in the Tunnel and on some of the trains. This appeared to be sanctioned by Eurostar staff (see recommendation 15.3).

A number of the trains were left in complete darkness when the power failed. Each Train Manager is currently expected to carry a torch and there have been historical problems keeping light sticks onboard the trains without theft. The provision of additional light is covered in the recommendation 13.5.

Procedures state that luggage should be left behind in an evacuation and safety cards say this. There is however no process to reconcile passengers with luggage that is left (see recommendations 15.1 & 15.2).

## Chapter 6 Train Terminals

The Chapter details, chronologically, how the disruption was managed at each of the Eurostar terminals between Saturday 19<sup>th</sup> and Thursday 24<sup>th</sup> December. All timings for St Pancras are in GMT. Timings for Paris Gare du Nord, Brussels-Midi, Marne-la-Vallée and Roissy are in CET.

### i) St Pancras

#### ***Saturday 19<sup>th</sup> December***

On Saturday morning, Eurostar organised a welcome point for passengers arriving into St Pancras having been delayed overnight after their trains broke down in the tunnel. As well as offering food and drink, staff were on hand to help arrange onward travel and accommodation but passengers had to wait up to an hour for assistance, compounding the delays so far encountered. Eurostar did not arrange for any staff to greet passengers, hand out claim forms and apologise for the delays as they got off the trains. This caused upset to a number of passengers (see recommendation 20.6).

Following the failure of the five trains on Friday 18<sup>th</sup>, it was decided to suspend all Saturday morning services. Any passengers that arrived at St Pancras in the morning were therefore advised that there would be no trains running until midday and that resumption of service after this was not guaranteed. Passengers were advised to postpone or cancel their travel if possible and that tickets and reasonable hotel expenses would be reimbursed.

Subsequently, four trains were announced and passengers were checked in for these. The first train departed and reached its destination but following the failure of a train (9035) travelling from Paris to St Pancras, the next three were cancelled. During this period, very few announcements were made, leading to considerable confusion and frustration amongst passengers (see recommendation 17.3).

Eurostar was able to charter five coaches to take some of these checked-in passengers by ferry. Four coaches travelled to Paris and one to Brussels arriving some 12 hours later. Other passengers were advised to postpone their journeys and, where needed, accommodation was arranged by Eurostar, although many customers found it difficult to find staff to help them. A small number of passengers chose to wait in the terminal overnight.

Shortly after midnight on the Saturday, the delayed 9035 (which had broken down and been towed by Eurostar rescue train and Krupps to London) arrived at St Pancras at 00.07hrs. Eurostar staff were well organised for the arrival of this train and organised onward transport by taxi and hotel accommodation.

### ***Sunday 20<sup>th</sup> and Monday 21<sup>st</sup> December***

As was the case on Saturday and again on Monday, no queuing system was in operation on Sunday as Eurostar was not checking in passengers to travel. Staff were available in the terminal to answer passenger questions although proactive communication was limited. Refreshments were provided from a table in the terminal.

The ticket office was shut as no new tickets were being sold and it wasn't possible to re-book passengers until it was clear when services would resume. Many customers have criticised the closure of the ticket office, feeling that it was an obvious information point for delayed passengers. This situation could have been managed more effectively if suitable signage had been placed at the ticket office explaining where passengers could access information at the terminal.

Passengers had great difficulty getting through to the call centre. Many waited a long time or were cut off. Other report a recorded message stating the call centre was shut. This was an ongoing problem throughout the disruption (see recommendations 20.1 & 20.2).

### ***Tuesday 22<sup>nd</sup> December***

A queuing system was first implemented from 06.00hrs when services resumed. In preparation for dealing with a significant volume of passengers, Eurostar set up a 'snake' queuing system which had been introduced successfully during previous periods of disruption.

Those passengers originally due to travel over the weekend were prioritised for travel that day and passengers who were due to travel on the Tuesday were asked to postpone their trip. This was communicated via the website and the call centre but due to the lack of variable information boards in St Pancras, it would only be communicated by word of mouth and announcements in the station itself.

For passengers, the prioritisation of weekend passengers could have been communicated more clearly at the beginning of the queue, for example using large A Boards for information. This would have ensured passengers did not queue unnecessarily when they would be unable to travel that day (see recommendation 20.3).

Eurostar's catering staff were also mobilised to provide refreshments to passengers in the queue.

Following previous periods of disruption, Eurostar developed an alternative check-in system called ARC, a manual ticketing system using colour coded tickets. In light of the restricted service in operation, and the prioritisation of passengers who were not originally due to travel on the Tuesday, Eurostar implemented the ARC system.

As this is very labour intensive at the check-in point, it did mean that fewer staff were available to provide assistance to people in the queue

itself. It is likely this contributed to the sense that there were few Eurostar staff on hand to help passengers.

The queues at St Pancras had disappeared by 14.00hrs and some trains left with empty seats. In the light of this, Eurostar decided later that day to change the check-in procedure for the Wednesday. Rather than restrict the service to passengers delayed from the weekend and Monday, it was announced that all passengers booked to travel up to and including Wednesday and Thursday could travel.

### ***Wednesday 23<sup>rd</sup> December***

Some passengers had waited overnight Tuesday at the terminal and others arrived in the very early hours of Wednesday morning. By 05.00hrs there was already a significant volume of passengers at the station. Initially it was possible to maintain the 'snake' arrangement within the Eurostar part of the terminal; however, in the main part of main concourse, a number of 'feeder' queues quickly appeared as passengers were unclear where the official queue began.

Additional barriers were erected to try and maintain the queuing system but were quickly rendered ineffective by the fast-growing queues.

Shortly after 06.30hrs Network Rail and the British Transport Police took the decision to try and consolidate the various 'feeder' queues to re-establish a clear beginning and end to the main queue. A large number of people had been waiting in the taxi area outside of the station for some time and, due to the cold temperature, it was decided to take this group of people as a priority and merge them into the main queue inside.

At approximately 09.00hrs, an announcement was made requesting people's cooperation with the movement of the queue. Passengers were advised that trains were running and they would be able to travel that day.

Nonetheless, the consolidation of the queue did cause some chaos and confusion and many passengers were unhappy that other travellers were able to join the queue in front of them.

Removing the feeder queue from the taxi area did however mean that the area could be sealed off and the queue managed more effectively.

With the help of British Transport Police, the main arcade was largely cleared by 10.00hrs. An orderly queue was re-established for departures and space was created for incoming arrivals. The queuing system was closely monitored throughout the day by Eurostar, Network Rail and British Transport Police. To prevent over-congestion, the queue was shut again in the afternoon and passengers asked to return later in the day.

In feedback from passengers and in discussion with British Transport Police and Network Rail there was a perception that there were not enough Eurostar staff on duty in the first part of Wednesday morning.



This view is partly formed by the fact that Eurostar's uniform does not stand out in a crowded environment (see recommendation 20.3).

Initially on Wednesday Network Rail organised coffee shops and cafes to provide refreshment to waiting passengers. Eurostar's catering crew then took over this role and provided refreshments to passengers in the station. The Salvation Army was also invited by Camden Council (following contact from Network Rail) to help look after passengers inside and outside of the station.

In the past, passengers for both Brussels and Paris have not been divided into separate queues. Due to the relatively smaller number of passengers travelling to Brussels, and the fact that these services are less frequent, this has worked effectively. However, with the high volumes of passengers waiting to travel before Christmas, particularly on Wednesday 23<sup>rd</sup>, which was the busiest day at St Pancras, this system may have led to Brussels passengers queuing for longer than necessary. Certainly the lack of division caused immense frustration to passengers travelling to Brussels (see recommendation 19.1).

#### ***Thursday 24<sup>th</sup> December***

The queuing system was resumed. The volume of passengers was manageable and, on average, the wait between arriving outside the station and entering the departure lounge was approximately one hour.

## **ii) Gare du Nord**

### ***Friday 18<sup>th</sup> December***

Two trains (9050 and 9054) arrived into Gare du Nord at around 00.45hrs, having been delayed by the failure of five northbound trains in the tunnel. When the trains arrived the Metro had closed and the main terminal shut shortly afterwards. There were therefore a large number of passengers waiting for taxis outside the station. Availability of taxis late at night at Gare du Nord is an ongoing problem, which Eurostar is aware of and working with SNCF to address.

### ***Saturday 19<sup>th</sup> December***

Following the train failures the night before, there were no plans to run Eurostar services from Gare du Nord. It was expected that a large number of passengers would arrive at the station expecting to travel, so additional Eurostar commercial staff were drafted in to support the usual team of station staff.

Eurostar staff had also alerted SNCF on the Friday night to prepare for the 9063, which arrived at 11.20hrs having been held outside the tunnel overnight. Passengers disembarking the train received coffee, croissants and water. Help was also provided organising taxis, arranging connections with local French rail services and booking hotel rooms.

Throughout the day there were between 15-20 staff at the station, of which approximately seven were Eurostar's own staff. The rest were general SNCF station staff; however, some of these were temporary students contracted to work over the Christmas period, and were less experienced than permanent staff members.

In order to communicate the suspension of services to arriving passengers, a team of staff, including one Eurostar representative (English and French speaking), an SNCF representative and a member of the security team, was situated at each escalator point.

The Eurostar area within the upper concourse was closed to prevent potential safety issues arising from over-crowding around the escalators. This procedure had been introduced following reviews of previous periods of disruption. Because the ticket office on the upper concourse was closed, two desks were opened on the ground level to answer customer queries.

There are a number of variable information screens at Gare du Nord but passengers did not feel that these were updated frequently enough, or with sufficiently detailed information.

SNCF "Gilet Rouge" staff were also brought in to provide information to people waiting in the queue, however the impression to passengers was that there were few staff available relative to the number of delayed customers and that help was not very forthcoming (see recommendation 20.3).

There was no formal provision of information on making alternative arrangements, e.g. by ferry, and SNCF was not requested to honour Eurostar tickets on regional train services (see recommendations 19.2 & 20.5).

Because a large proportion of the passengers delayed at Gare du Nord were reliant on the information provided at the station (many were unable to access the Eurostar website or to get through to the call centre in Ashford) the perceived lack of information was a major frustration (see recommendation 20.1).

The decision not to run services on the Saturday was later amended and, at approximately 01.30hrs, an announcement was made that the 9035 service would be checking in passengers on a first come, first served basis. The train departed late at 15.16hrs and, after technical difficulties in the tunnel, later failed at 17.08hrs but eventually reached St Pancras – see Chapter 3 for details.

Subsequently, the 9043 departed at 16.40hrs. This travelled to Lille where, following the failure of the 9035 train ahead, it was decided to return it to Paris via Roissy - see section (v) of this Chapter for details.

There were no further departures from Gare du Nord on Saturday 19<sup>th</sup>.

Efforts were made to help delayed passengers to arrange accommodation but there was very limited availability of hotel rooms in Paris near to Gare du Nord over the weekend. This was quite normal at this time of year and the problem had been compounded by the bad weather forcing people to change travel plans. As a result, over the coming days, it was difficult to arrange accommodation for the many passengers who were delayed in Paris by the suspension of the Eurostar service.

### ***Sunday 20<sup>th</sup> and Monday 21<sup>st</sup> December***

On Sunday 20<sup>th</sup>, additional staff were drafted into Gare du Nord to enable more proactive provision of information to customers waiting in the station. Although staff wore armbands, passengers found it difficult to identify them in the busy terminal.

Eurostar activated a contract with a local catering firm (originally introduced during the 2008 fire) to start providing coffee and croissants to people waiting in the terminal. This policy was continued on Monday 21<sup>st</sup> and SNCF drafted in even more staff to help passengers.

### ***Tuesday 22<sup>nd</sup> and Wednesday 23<sup>rd</sup> December***

When services resumed on Tuesday, those passengers that arrived at Gare du Nord were able to travel that day and also on Wednesday. Whilst passengers experienced some queues, these were much shorter than those at St Pancras.

### **iii) Marne-la-Vallée**

#### ***Saturday 19<sup>th</sup> December***

All Eurostar services were suspended from Marne-la-Vallée. This was the official advice provided to passengers staying at Disneyland Paris, however very little information was proactively communicated, either from the station or via the resort hotels. A large number of passengers visited the station to obtain updates, however only two staff were available, including the terminal manager who was new in the role.

As a result, many passengers were confused regarding when services would resume (in fact this was not known at this time), whether any alternative forms of transport would be organised, and how they should fund additional nights' accommodation at Disneyland Paris.

#### ***Sunday 20<sup>th</sup> December***

The Eurostar team at Marne-la-Vallée was reinforced and a number of senior staff had arrived by the evening. Passengers enquiring about reimbursement of hotel expenses were provided with a letter from Eurostar's customer care team, authorising reimbursement of any hotel expenses incurred due to the disruption. Some passengers were able to obtain meal vouchers.

Throughout the period of disruption, customers were heavily reliant on the information provided at the station for a number of reasons: although some of the hotels provided updates, many directed guests to the station for information; there is limited internet access at Disneyland Paris; passengers faced lengthy and costly waits trying to reach the call centre via their mobile phones. This was an issue encountered by many passengers trying to contact the call centre, using a mobile phone on an international tariff.

The small number of staff available in the station, and the lack of information notices and posters, therefore caused considerable frustration.

#### ***Monday 21<sup>st</sup> December***

Alternative transport was arranged from Marne-la-Vallée on Monday – see Chapter 6 for more details.

#### **iv) Brussels-Midi**

##### ***Saturday 19<sup>th</sup> December***

By 10.00hrs, the departure area at Brussels-Midi was full, with some 600 checked-in passengers waiting for a planned departure at noon. There were approximately another 500 passengers waiting in the main terminal for departures later that day.

At approximately 11.30hrs it was announced that the 12.00hrs train had been cancelled and that there would be no more departures that day. Passengers were advised to postpone or cancel their trip and those that requested assistance in organising accommodation were helped to find hotel rooms.

Also at 11.00hrs, train 9163 service that had departed Brussels the night before and been held outside the tunnel overnight, returned to Brussels-Midi. Its arrival coincided with the announcement that services were to be suspended for the rest of the day.

All of the available station staff were managing the passengers waiting to depart and there were no additional staff to help greet train 9163. This was badly received by the passengers who had been stuck on the train all night and now had to join all of the other passengers queuing in the station to obtain information or request assistance in organising hotels.

At approximately 13.15hrs the suspension of services was reversed. It was announced that the 13.59hrs 9137 service would be running. This departed 17 minutes late at 14.16hrs. Vulnerable passengers and those people who had spent the night on train 9163 were prioritised for boarding.

Over the course of the Saturday afternoon (typically a quiet travel period from Brussels-Midi) around 1,500 people arrived at the station. Many were helped to find hotel accommodation.

##### ***Sunday 20<sup>th</sup> and Monday 21<sup>st</sup> December***

Over the course of disruption, before services resumed on the Tuesday, Eurostar organised around 530 rooms for delayed passengers in Brussels.

The staffing structure at Brussels-Midi made it difficult to draft in additional staff over the weekend however and attempts to send Eurostar staff from London to Brussels were hampered by the weather.

The shortage of available staff contributed to a lack of proactive information to customers. Passengers were frustrated by limited available information on alternative methods of transport (more detail on this can be found in Chapter 7). Customers also had difficulty in clarifying their entitlement to compensation and reimbursement of expenses (see recommendation 20.6).

##### ***Tuesday 21<sup>st</sup> – Thursday 23<sup>rd</sup> December***

Services resumed and passengers that came to the station were able to travel.

## **v) Roissy**

### ***Saturday 19<sup>th</sup> December***

During the disruption on Saturday 19<sup>th</sup>, the 9043 service from Gare du Nord was turned back at Lille due to the failure of preceding train 9035.

No more services were planned to run that day and it was anticipated that a large number of passengers onboard would require accommodation in Paris until services were resumed.

Given the lack of hotel availability near to Gare du Nord, it was decided to divert the train to Roissy, where typically there are more rooms available (this solution was used during the disruption caused the 2008 tunnel fire).

On arrival at Roissy station, passengers were asked to disembark the train if they needed accommodation but were given no further explanation as to what was planned. No Eurostar representatives were located at Roissy to help manage the situation and confusion was compounded when passengers were asked return to the train to wait, before disembarking again.

After a lengthy wait, a bus took passengers to a local hotel; however, a problem had occurred in confirming the block booking and rooms at another hotel had to be secured, leading to further delay.

Overall, the situation was one of total confusion and, whilst Eurostar had hoped to make the provision of hotel rooms easier for customers, in fact the experience was very frustrating. It should be noted that airline delays meant there were fewer hotel rooms available than would normally be the case.

## **Chapter 7 Eurostar arrangements for passengers impacted by the suspension of services**

### **Overview**

Eurostar's general policy for alternative transport when services are disrupted is to help customers return to their origin as quickly as possible, focusing on vulnerable passengers as a priority.

In the summer of 2009, Eurostar ran a tender exercise for a contractor to help provide hotel and coach solutions in case of disruption. Whilst there was not a strong response to the tender, Radio Taxis was selected as a contractor in the UK. In France, services were contracted through SNCF.

During the three days when trains were suspended in December, Eurostar made alternative travel arrangements for a number of its customers. As a result, Eurostar organised 95 coach journeys with a capacity of 4,860 seats and chartered four aircraft with a total capacity of 800 seats. This was against a daily requirement in this period to move about 30,000 passengers, meaning if they all went by coach it would require 600 coaches each day.

The overwhelming majority of customers were therefore unable to travel on the days they had planned to and experienced severe delays.

Whilst the high volume of passengers travelling before Christmas and the adverse weather conditions would have made it impossible to arrange contingency transport for all passengers, insufficient preparation had been done to manage disruption on this scale and to help passengers reach their destination (see recommendations 17.3, 17.4, 19.2 & 20.5).

When services resumed on Tuesday 22<sup>nd</sup>, many passengers were able to travel (albeit following considerable delays). Based on statements issued by Eurostar, all passengers were able to reach their planned destination by Christmas. Some passengers did not travel, however, and took the decision to cancel their trips entirely.

The following report details, chronologically, the provision of alternative transport and accommodation by Eurostar between Saturday 19<sup>th</sup> and Thursday 24<sup>th</sup> December. It also examines the overall provision of information to customers throughout the disruption.

### ***Saturday December 19<sup>th</sup>***

In the immediate aftermath of the train failures on Friday night, it was hoped that services might be resumed at midday on Saturday 19<sup>th</sup>. Eurostar had planned to run eight services: of these four departed and four were cancelled. Of the four departures, one failed on its journey from Paris Gare du Nord but did eventually reach London St Pancras (9035); a second was halted at Lille and returned to Paris (see Chapter 5 for more details).

Following the failure of the 9035, all services were finally suspended. At this point the availability of coaches was investigated. Five were chartered in the UK: four carried passengers from London to Paris; a fifth travelled to Brussels.

Further attempts to book coaches were hampered by the poor weather conditions. On Saturday the roads on both sides of the Channel were closed at various times. The Port of Calais had closed during the night and, although it started to receive Cross Channel traffic from 07.00hrs on Saturday 19<sup>th</sup>, no lorries were allowed to leave the Port.

On the M20 in Kent, Operation Stack was in place, meaning that the M20 was virtually closed in the morning, although it was possible later in the day to drive with great care. The congestion on the roads in the Dover Port area continued throughout Saturday and only started to ease in the early hours of Sunday December 20<sup>th</sup>. Freight was still not allowed to leave the Port of Calais and this ban stayed in place for any lorry over 7.5 tons until 12.15hrs.

During Saturday, Southeastern trains ran a virtually normal service from London to Dover via both Ashford and Faversham.

Eurostar passengers were advised not to travel and no advice was provided on other potential modes of transport.

No alternative provision was made for passengers planning to travel on the Saturday 'Ski Train'.

Some help was provided to passengers requiring accommodation due to the delays, although availability of hotels was an issue, particularly in Paris near to Gare du Nord (for more details see Chapter 6).

### ***Sunday December 20<sup>th</sup>***

Weather conditions remained very difficult in the UK, Northern France and Belgium. Operation Stack remained in place throughout Sunday and road congestion in the Dover area was severe, with queues of around five miles approaching the Port. The M20 was open but operating at a reduced speed because of the conditions. The side roads and pavements in Dover were covered in snow.

An aircraft charter was arranged by Eurostar to depart from Roissy Charles de Gaulle, Paris, to Stansted to transport 200 customers from train 9043, which had been refused entry into the channel tunnel on Saturday 19<sup>th</sup> December and returned to Paris. The charter aircraft was planned to operate:

Charles de Gaulle	14.00hrs dept
Stansted	15.20hrs arrival (14.20hrs GMT)
Stansted	16.20hrs departure (15.20hrs GMT)
Charles de Gaulle	17.40hrs arrival
Charles de Gaulle	18.40hrs departure
Stansted	20.00hrs arrival (19.00hrs GMT)



However, due to continued snowfall, Roissy Charles De Gaulle cut capacity by 40% at 11.00hrs, restricting all charter flights. Later in the day this restriction was lifted and Eurostar organised two, one-way charters to depart at 19.00hrs and 20.00hrs. These two services transported customers from Disneyland Paris and from the 9043 service which had returned to Paris the previous day.

Throughout Sunday, there were still no coaches available in Brussels or Paris. At both stations, customers were advised that if they made their own way to Calais it would be their own initiative, although in Brussels the Terminal Manager issued a letter to customers to present to Train Managers to allow free travel on regional services to Calais. In Paris customers were advised to purchase tickets and to claim these back from Eurostar Traveller Care (see recommendation 19.2).

In the UK, customers started to make their own way via Southeastern Trains to Dover Priory station, with the intention of transferring to the port and taking the ferry to Calais. Southeastern trains were severely disrupted between Faversham and Dover until around 16.00hrs (GMT); however, London to Dover services via Ashford ran normally.

The ports at Dover and Calais are no longer set up to handle large volumes of foot passengers, and both quickly became very congested. Passengers reported long queues at the ticket offices and having to wait outside in the snow and cold.

Throughout the period of disruption, the lack of transfer arrangements between the train station and port in both Calais and Dover proved a major problem for travellers. With many passengers having to walk up to an hour, with luggage, in snow and ice, there was a strong perception that Eurostar had not communicated effectively with the ferry companies (see recommendation 17.4). Passengers saw few, if any, Eurostar representatives at the ports and felt this showed a disregard for passenger care. Conversely, P&O Ferries and its staff were praised for the level of customer service they provided.

It is worth noting that P&O would normally expect to carry some 500 foot passengers over this period. In fact it carried around 15,000 foot passengers (see table at end of Chapter).

Due to the congestion on the Sunday, P&O quickly advised that it could not accommodate more foot passengers at the Port of Dover. Eurostar therefore arranged for ten coaches to pick up passengers who had arrived by train at Dover Priory and to transport them on to either Paris or Bruxelles.

Two Eurostar members of staff were sent to Dover Priory to help manage the situation; however, the volume of passengers arriving from St Pancras meant the situation quickly became chaotic. The problem was

compounded when the ten chartered coaches arrived initially at the Port rather than Dover Priory.

Independently, P&O tried to help and chartered 11 coaches to depart from Dover Priory to take passengers to Paris.

Kent Police helped to manage the situation but many passengers were forced to walk to the port from the train station, in cold and icy conditions.

On the Sunday evening, approximately 700 passengers who had travelled independently to France were stranded at the Port of Calais with no onward transport as the last bus service had departed. Whilst some were able to make their own arrangements for onward travel, there was a shortage of taxis and approximately 70 people spent a cold and uncomfortable night in the Port Terminal. Eurostar made no provision for their onward transportation and did not request any help from the French authorities.

### ***Monday December 21<sup>st</sup>***

In the UK, road conditions had improved and Operation Stack was terminated at 02.40hrs GMT. However, Eurotunnel had problems in the Folkestone Terminal and a large influx of Eurostar customers travelled to Dover by car, adding to the congestion on the ferries. Dover Harbour Board and P&O put in place special queuing arrangements at Dover to handle the continuing influx of foot passengers. Eurostar also sent a team of seven people to Dover Priory and Docks to help manage the situation.

Eurostar started formally to put in place alternative arrangements for passengers wishing to travel by train from London and agreed ticketing arrangements with Southeastern Trains. However, at this time Southeastern trains was running a very limited service between both Faversham and Dover, and Ashford International and Dover. This service did not really improve throughout the day and as this became apparent Eurostar advised passengers not to try to use Southeastern services.

Eurostar used the departure lounge at Ashford to accommodate people temporarily in the warmth where food and beverages were made available. By 10.00hrs (GMT), there were 1,000 customers at the station, all waiting in the international departure lounge.

20 coaches were booked to take these customers from Ashford to Paris / Brussels.

Some of the coaches took passengers from Ashford to Dover; others were diverted to Faversham where another group of passengers was stranded. Some coaches were diverted to Dover Priory and asked to collect passengers from there, taking them right through to Paris/Brussels.

There does not appear to have been a clearly coordinated plan for these arrangements. Due to a miscommunication, coach drivers who had picked customers up from Ashford dropped them off at Dover Priory, leaving the customers to make their own way through the snow to the port where

they boarded as foot passengers. Other coaches terminated at the port as drivers were without the necessary documentation (see recommendation 19.3).

Some coaches did cross to France; however, passengers that travelled late on Monday encountered severe problems on arrival in Calais. A number of coaches from the UK terminated their journey as the drivers were "out of hours" on their shift. Passengers were told more coaches were on their way; however no such arrangements had been put in place and there were no more onward train or bus services that evening. When Eurostar became aware of the problem at 02.00hrs it requested additional coaches from the SNCF Centre National des Operations (CNO) but none were available before the first departing train from Calais Ville at 05.02hrs.

Some customers were able to obtain taxis but around 75 were left to spend the night in the terminal building which was very cold and uncomfortable. Eventually, the local police were called, following which the sous-prefet of Calais asked the Mayoress of Calais to organise, together with the Red Cross, an emergency shelter in a local gymnasium in the centre of Calais.

Similar problems were encountered by passengers trying to make the return journey from Belgium by coach and ferry. In Brussels, 15 coaches were booked to depart with customers for the UK on board (only 219 customers used the option). It was planned that these coaches would terminate in Ashford (to avoid creating additional congestion in Dover) where customers would catch a Southeastern Train to London. The coaches would pick up passengers from Dover Priory and return to Bruxelles/Lille.

However, some of the coaches that departed from Brussels terminated at Dover docks at c.23.00hrs (22.00hrs GMT), again due to driver shifts ending. Other foot passengers arrived too late to catch the last connecting train. Although Radio Taxis was ultimately able to send another two coaches to collect these customers there was some confusion in the interim period. Passengers report being told they would have to wait overnight in the cold terminal building at Dover and indeed some did spend the night there, waiting for the first coach service to run on Tuesday morning. St John's Ambulance and Salvation Army provided food and blankets but passengers were upset and angered by the experience.

From Marne-la-Vallee, 15 coaches departed throughout the Monday morning transporting 750 customers back to the UK from Disneyland Paris. 60 customers chose not to travel overnight and remained in Disneyland along with the other six coaches.

Whilst the coaches were designated to depart from each of the Disney hotels, there was also a large number of customers in non-Disney hotels who were told to go to Marne-la-Vallee station in order to board a coach. The differing pick-up points and lack of clarity over departure times caused confusion and many passengers faced long waits. After a long and

reportedly uncomfortable journey, the coaches called at Ashford International where the majority of customers alighted and finally arrived back in London between 01.00hrs and 04.45hrs (00.00hrs and 03.45hrs GMT) on Tuesday December 22<sup>nd</sup> where they were met by a team of seven members of Eurostar staff.

For other passengers trying to travel from France on the Monday, the situation was very difficult. The Terminal Manager at Gare du Nord was unable to find any coach availability due to both the snow and road conditions. Local travel was complicated by the closure of Paris Austerlitz station, where a tree had damaged the overhead lines. In addition staff on RER line A were on strike and customers could not get from Disneyland to central Paris. Any available coaches had already been deployed to transport domestic and commuter passengers.

An aircraft was chartered to operate from Stansted to Roissy Charles De Gaulle for c.200 school children who were party of a school trip. These children were taken to Stansted using the Stansted Express by a group of Senior Eurostar Managers. Due to the snow falling, Stansted airport was closed and the aircraft was diverted to East Midlands. The school children were booked into hotel rooms at Stansted airport until the following day.

### ***Tuesday 22<sup>nd</sup> – Thursday 24<sup>th</sup> December***

With the resumption of Eurostar services on the Tuesday, Eurostar's focus was to accommodate as many passengers as possible by train. More detail on how this was managed can be found in Chapter 5.

The cancelled flight for schoolchildren from Stansted finally departed at 19.30hrs (18.30hrs GMT) on Tuesday 22<sup>nd</sup> after two separate technical issues. The 200 school children were either collected by family from the airport or in one case a coach was arranged from Paris to Le Creusot for one of the larger groups. The return leg of the flight was delayed again as the same, second technical fault needed to be repaired. At c.22.00hrs (21.00hrs GMT) this departed with 200 people from Marne-la-Vallee on board. These customers were all given taxis home, arranged through Radio Taxis.

Also on the Tuesday, 60 customers were taken by coach from Marne-la-Vallee to Paris in order to take a Eurostar service from the Gare du Nord. Coaches were also arranged to depart from Bruxelles at 08.00hrs, 10.00hrs and 12.00hrs in order to bolster capacity as the timetable was limited to five return journeys. Due to the resumption of service, some of the coaches that had travelled out on the Sunday and Monday returned empty to the UK on the Tuesday.

On Christmas Eve, whilst Eurostar operated a modified timetable, it also held a contingency plan in case it did not have enough capacity to carry all passengers, or people missed the last trains which were operating earlier than normal. In case any additional transport was required, a charter flight from London to Paris and one from Paris to London was booked, with coach transfers to and from the put into standby. These contingencies were not used.

***The number of passengers who travelled on P&O Ferries over this period:***

	<b>Sat 19 Dec</b>	<b>Sun 20 Dec</b>	<b>Mon 21 Dec</b>	<b>Tue 22 Dec</b>	<b>Wed 23 Dec</b>	<b>Total</b>
<b>Calais – Dover CADO</b>	<b>623</b>	<b>1867</b>	<b>2979</b>	<b>712</b>	<b>335</b>	<b>6516</b>
<b>Dover – Calais DOCA</b>	<b>666</b>	<b>2126</b>	<b>2393</b>	<b>1986</b>	<b>995</b>	<b>8166</b>
<b>Total</b>	<b>1289</b>	<b>3993</b>	<b>5372</b>	<b>2698</b>	<b>1330</b>	<b>14682</b>

**Overall information provision**

(See recommendation 20)

The difficulty that passengers faced in accessing clear, consistent and timely information is one of the major criticisms levelled at Eurostar's handling of the disruption before Christmas.

The provision of customer information in the Eurostar terminals has been covered in some detail in Chapter 6.

This Review has also revealed the need for a far more co-ordinated and robust process for communicating with customers across all channels, including the call centre, website and other media. In all cases, Eurostar did not provide an adequate level of service.

Passengers were often instructed to call the customer line or visit the website for more information but then found these to be totally inadequate.

The call centre hours were slightly extended in the evening, from the usual closing time of 19.00hrs to 20.30hrs on Saturday 19<sup>th</sup>; to 21.00hrs from Sunday 20<sup>th</sup> – Wednesday 23<sup>rd</sup>; and to 17.00hrs on Thursday 24<sup>th</sup>. Beyond this there was no 'out of hours' provision.

The staffing levels were not able to cope with demand, resulting in long call queues and customer calls being terminated before they were answered. For passengers calling from abroad using mobile phones this was unacceptable and many feared incurring large phone bills.

The website was updated with basic information regarding the disruption, but customers felt that updates were slow and insufficient. Whilst the advice *not* to travel was communicated clearly, there was no information or advice on alternative transport or accommodation.

Customers have also complained that information was not sufficiently prominent on the homepage (making it especially difficult for those using handheld devices to access updates). Indeed, the homepage layout was

not amended until midday on Monday 21<sup>st</sup>, when content other than the disruption message and booking engine was removed.

Some email communications were sent to customers, but not until the Monday. There was no facility for providing text updates to passengers.

Overall, the information about alternative methods of transport was poor. No real facility was established for sharing contact numbers and timetables for ferries, trains or airlines. There was also a lack of clarity regarding validity of Eurostar tickets on trains and ferries. In fact, this had not been officially arranged and although some train companies did honour Eurostar tickets, many other passengers were forced to buy new tickets. Over the initial period of disruption, on the Saturday in particular, there was uncertainty over compensation and what costs would be reimbursed (e.g. for hotels, transport and other expenses such as meals).

## **Chapter 8 Recommendations**

### **1) Technical problems on the Eurostar power cars**

The design of the Eurostar power cars was based on the classical TGV model, yet they are much more complex machines. They incorporate the most complex and powerful electrical system in the entire TGV family and this system is fitted within a space that is significantly smaller than is the case with the other TGVs. Given its size (small, so as to be compatible with the UK loading gauge) and weight, it is more powerful than all other power cars currently in service. One result of this is that the ventilation has to be very powerful and the design provides for large volumes of air to be sucked in from the exterior and, using heavy-duty fans, distributed across any equipment needing to be cooled down.

The atmosphere in the tunnel is warm and moist: the temperature in the central section of the tunnel was between 20 to 25° Celsius on the night of 18<sup>th</sup> December, with the humidity averaging 70% (85% at the portal, decreasing towards the middle of the tunnel). Outside the Tunnel, Eurostar trains operate at speeds of between 270 and 300 km/h for long periods of time, in particular those travelling from Paris or Brussels, and all exposed surfaces have a temperature similar to that of the ambient air.

One result of this is that in winter, and taking into account the significant difference in temperature between the outside and inside of the Tunnel and the atmospheric humidity within it, condensation builds up on the equipment in the power cars (electronics, common blocs, motor groups). In addition, snow drawn into the vehicle by the ventilation fans gets into the equipment.

Unfortunately it is clear that these problems were not fully recognised at the time when the Eurostar power cars were being designed, which took place as the Tunnel was being constructed. The result has been a number of incidents since Eurostar services commenced. A considerable number of actions have been carried out to prevent further incidents, but these have not been fully effective

The incidents of the night of 18<sup>th</sup> and 19<sup>th</sup> December, and the trials conducted on 20<sup>th</sup> and 21<sup>st</sup> December, demonstrated that the precautions against snow were not adequate for the climatic conditions encountered, that some light maintenance procedures had been insufficient and that not enough attention had been paid to the ageing of certain components e.g. the seal around control cubicle doors. They also showed that certain aspects of the design of the power cars – which necessitate high volumes of ventilation as well as effective water resistance and the protection of sensitive components – were at fault.

Some emergency measures have already been taken to rectify this issue. These include additional winterisation measures, in particular checking the adjustment of the snow filters that are installed behind the bodyside louvres, additional snow prevention measures at a range of sensitive points, and the adjustment of cabinet doors and covers of electronic equipment racks.

To these must be added special operating measures in the event of snow:

- i) a reduction of speed to 170km/h, to avoid the creation of a cloud of snow which would allow it to enter more easily into the power cars.
- ii) checking of the state of the power cars before entering into the Tunnel.
- iii) temporary technical support on board the trains.

**Recommendation 1: We recommend that key complementary measures should be taken before the coming winter.**

**a) Light maintenance**

An investigation into the reason the snow filters proved inadequate needs to be undertaken. This should determine whether the filter material has deteriorated over time and whether an improved material would reduce the blocking of the filters with snow. An exhaustive inventory of the spots at which snow has entered into sensitive equipment needs to be compiled, checking that maintenance operations have been carried out correctly, an improvement in winterisation procedures - including checks on the overall sealing of the doors in control cubicles.

**b) Electronics**

It is recommended that the causes of failures in the electronic control systems be examined, with a view to preventing condensation and pollution on/of the electronic cards. In particular, consideration should be given to providing covers to keep snow out of the signalling and data systems.

**c) Motor blocs**

- i) Protection of the motor-bloc inductors, for example through the use of glass fibre.
- ii) The placing on the inside roof an effective insulating layer.

**d) Common blocs**

- i) Completion of the various modifications (such as improvements in power factor control switching cards) to bring the equipment up to the latest standards.
- ii) Checking that modifications to printed circuit board have included adequate conformal coating to prevent effect of moisture.



**Recommendation 2: We recommend that some more measures must be taken with the long term in mind: a full and thorough review of winter incidents is called for. This review will need to take into account a range of climatic scenarios.**

This should include an examination of what Eurotunnel is already doing for the power cars of its shuttles; what other railway companies are doing to trains that operate in difficult climatic conditions and also in long tunnels (Switzerland, Japan); and what companies, which operate trains both outside, amid conditions of extreme cold, and in warm, underground conditions (such as in mines) are doing.

The case might also exist for having a system for the ventilation of the motors in which air sucked in from the outside is circulated over the motors and transformers but does not penetrate into the rest of the power car. This should be looked at when designing the next generation of Eurostar power cars.

**Recommendation 3: Without waiting for the results of this review we recommend modifying the method of cooling the sensitive components.**

As has already been mentioned, it is unfortunate that the electronic systems should be exposed to the atmosphere in the body of the power car – be they the electronics system or components of the common bloc or motor group. The result is that these components are subjected to condensation, metal dust and to snow which melts on them. A review to determine alternative methods for ventilation and cooling is recommended.

Consideration should be made for modifying the cubicles carrying electronic components in sealed cabinets, with cooling systems that do not circulate contaminated air. Similar solutions have been adopted by many train designs, including Eurotunnel shuttle locomotives, not due to snow but to protect these components from metallic dust. This solution needs to be the subject of an in-depth feasibility study and could be implemented as part of a mid-life review of the trainsets.

**Recommendation 4: We recommend the insulation of the inductors and a full review of the design of the roof.**

As part of the mid-life review the insulation of the inductors should be increased, in addition to what needs to be done before the next winter period. A review should also be conducted into the design of the roof located below the pantograph to increase the clearance above equipment (which is possible now the height is not limited by the need to comply with the loading gauge of the 750V lines in the UK) with a view to distancing and insulating it.

**Recommendation 5: We recommend examining the possibility of changing the control of the HV system to maintain the auxiliary system, and hence the air conditioning, even when there is failure of the traction system.**

Modifications to the control system to allow the pantograph to be raised and the auxiliary system to be maintained would be extremely useful so as to keep the air conditioning working. This has an effect not only on comfort, but also in terms of safety because, if the temperature is too high, passengers are greatly tempted to open the doors of the train when it is in the Tunnel.

On a *TGV Réseau*, the power car pantographs are controlled by hard wiring, rather than by the electronic system, as are the circuit breaker and the compressor. The driver can therefore raise the pantographs from the power car.

In the case of the Eurostar power cars, the controls are electronic and there is no wired back-up control. It is also not possible to generate the auxiliary system without the common bloc being energised, due to the original need to accommodate the 750V supplies.

## **2) Handling of the crisis**

### **a) Tunnel procedures**

It is apparent in reading the emergency procedures for Eurotunnel and Eurostar that these concentrate quite rightly on the issue of evacuation in the event of fire or some other serious event.

Whilst there is a procedure, reference OSRM 404, the Review did not consider that this addressed satisfactorily the potential need to evacuate a Eurostar train due to loss of air conditioning, lighting and other sanitation factors.

In looking at the events that took place on the 18<sup>th</sup>/19<sup>th</sup> December, it is clear that conditions on the Eurostar Disney Train 9057 deteriorated very quickly. With the rapid build-up of heat after loss of air conditioning, many passengers on the train perceived themselves to be in an emergency situation.

**Recommendation 6:**  
**We recommend that there is an urgent need for Eurotunnel to review procedure OSRM 404 and revise its procedures for the possible evacuation of a train when it loses power, and in particular, its air conditioning.**

## **b) Crisis Control Communications**

When Eurotunnel is faced with disruption within the Tunnel, its crisis management programme is activated and the Crisis Control Centre (CCC) established. When this happens, whether or not a Binat is called, there is a need to review the communication arrangements that exist between Eurotunnel and Eurostar and the freight operators (as well as any other international passenger operator that might use the Tunnel in future).

Currently the communications link between Eurotunnel Rail Control Centre (RCC) and Eurostar's Rail Operation Centre at Lille is in the form of a telephone link.

### **Recommendation 7:**

- 7.1 We recommend the introduction of a video link between the RCC and COE Lille (and the equivalent of Lille for any other train operator that might come to use the Tunnel in future).**
- 7.2 We recommend also a video link between the CCC and the COE in Lille.**
- 7.3 We recommend the introduction of a video link between the CCC and Eurostar Gold Command, which is currently based in Eurostar's Head Office in London. Again the same requirement would exist for any other operator using the Tunnel from their Gold Command into the CCC.**

All decisions to be taken during the crisis, including those of the authorities, should take into account the infrastructure manager's views as well as those of the railway company, with the aim of improving efficiency of looking after travellers. These joint decisions must nonetheless be taken rapidly.

Good information to passengers must be an important part of the handling of the crisis.

- 7.4 If passengers are evacuated onto a rescue vehicle there needs to be a better rehearsed procedure. During the period when a train is stopped in the Tunnel, a safety briefing should be broadcast by the Train Manager to explain to passengers what will happen and provide instructions about what to do if they are evacuated.**

This would ensure all passengers understand the process if an evacuation becomes necessary. This was evidently an issue for passengers evacuated onto the Eurotunnel shuttles, who did not understand the single/double deck distinction.

- 7.5 We recommend that passengers should also be briefed on the layout of rescue train that they will be boarding, to**

**ensure there is no confusion about where to board and where they are then located.**

- 7.6 We recommend that Eurotunnel reviews the briefing it gives to passengers who are evacuated onto a shuttle from a Eurostar train.**
- 7.7 To aid evacuation, Eurostar needs to provide high-visibility vests for train managers. Catering crew should also be identifiable and need to be trained so that they can help in an evacuation.**
- 7.8 We also recommend that if an evacuation shuttle is mobilised, the senior Eurotunnel contact on the train (in addition to the Chef de Train who is in a cabin) is easily identifiable to the Eurostar staff.**

**c) Define in advance strategies and means for bringing assistance to Eurostar trains stranded in the Tunnel**

**Recommendation 8:**

- 8.1 We recommend that Eurostar and Eurotunnel should again review their order of priority for removing trains that have broken down in the Tunnel, following the experience of 18/19th December. In all cases they should try to take the rescued train to either Ashford International or Calais Frethun.**

Clearly, the decision as to which method of removing the failed Eurostar train is applied lies with Eurotunnel, which would normally consult with Eurostar. The final decision lies with Eurotunnel; however, based on the experience of 18/19<sup>th</sup> December, the use of a Eurotunnel shuttle should be a last resort.

We are of the opinion that it may take some time to get an empty Eurostar train into the Tunnel, whereas the Krupps locomotives are already within the concession. This rescue by a Krupps locomotive should therefore be the first choice.

This order of priority should be written in a document approved by the two parties, regularly evaluated, and sent to the IGC.

We are concerned that with only two Krupp rescue locomotives available to the Tunnel and now providing rescue on HS1 as well, there may be insufficient rescue locomotives available, even if any future trains are taken only as far as Ashford.

- 8.2 We recommend that the infrastructure providers on both sides of the Channel and Eurotunnel review the provision of such rescue locomotives.**

It was disappointing that approval for the Krupps to go to Ashford had not been put in place between Eurotunnel and Network Rail at the time of the disruption. We understand that whilst the Krupps is now able to go to Ashford, this has still not been formally approved. The Krupps is approved to go to Calais Frethun LGV.

#### **d) Signalling between the Concession, HS1 and LGV**

##### **Recommendation 9**

**We recommend that work needs to be undertaken to ensure that the Krupps locomotives and any future locomotives that might be introduced can move easily between the Concession and HS1 and LGV<sup>1</sup>.\*.**

Currently the Krupps has to stop at multiple signals to get permission to move forward on to HS1. This process takes 40 minutes. We understand that requests have been made from Eurotunnel to SNCF for the TVM system on the Krupps to be altered to avoid such delays. A similar situation exists when the Krupps exits the Concession to join LGV to go to Calais Frethun. This alteration needs to be implemented quickly.

#### **e) Communications between Eurotunnel RCC and train managers and between the latter and Eurostar (Lille Ops Centre).**

The current procedure for passing information through to the driver does not always ensure that passenger information gets to either the RCC or to passengers as the driver is rightly occupied in trying to deal with the technical problems on his train.

##### **Recommendation 10:**

**10.1 We recommend that when Eurotunnel declares an emergency an additional communication point in the RCC should be created. This should deal specifically with passenger issues that may arise on a train that is stopped in the Tunnel for any length of time.**

This control position needs to be able to speak to the Train Manager of a Eurostar train and to be able to receive information about the conditions on the delayed train. The control position must also be able to provide passenger information that the Train Manager, which can then be relayed to customers on the train.

It should be noted that this communication channel to the Train Manager should in no way interfere with the train's safety provisions, which must remain the responsibility of the RCC in conjunction with the driver.

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<sup>1</sup> \*HS1 is the High Speed Line in Kent, England. LGV is the Ligne Grande Vitesse in France

It is now a recognised procedure on railways that a train company be able to talk to the Train Manager on any train to deal with customer service issues. Current technology in the Tunnel does not allow this.

**10.2 We recommend that Eurotunnel see whether there is any means that such a communication channel could be put in place in advance of the introduction of GSMR. We also recommend that GSMR should be introduced very quickly and be configured so that such communication can take place in future.**

**10.3 We further recommend that in future any operator should be able to talk to the Train Manager to discuss passenger issues, and with the Train Driver to discuss technical issues that might enable the train to move forward.**

Eurotunnel has such a technical team mobilised to be able to formulate advice for the driver of a Eurotunnel locomotive.

**10.4 Clearly, these procedures need to be reviewed in their entirety by the Safety Authorities to ensure there is no risk of interfering with the normal procedures regarding safety.**

#### **f) Training of on-board Eurostar staff**

The train managers were left alone to deal with passengers. Even if they had been able to communicate with the respective Eurotunnel and Eurostar Ops HQs (which would have much improved the situation), stress would still have been a major factor.

#### **Recommendation 11:**

**We recommend that Eurostar Train Managers should be given special stress-management training similar to that given to airline crews. This should include additional training in how to address passengers during disruption, in order to inform and reassure them. This should be done in English and in French. It should also include measures to be taken by Train Managers in cases of evacuation in the Tunnel.**

#### **g) Outline of personnel structure of the future Eurostar.**

At present, with the British crews, the deputy train manager (TM2) is actually a train manager who has undergone additional driver training. With the French crews, the TM2 is a driver who has received additional English language training. It is clear to us that the British TM2 who has had full train manager training and additional driver training is better-placed to assist the train manager in taking charge of the 750 passengers on board. This should be taken in account in the new Eurostar structure. It would also be advisable to look again at the role of the catering staff notably the Bar 1 and the Bar 2, which should include, in case of problems, the ability to assist with passenger safety. Of course they should receive adequate training to enable them to undertake this role.

**Recommendation 12:**

**We recommend that Eurostar should review the responsibilities and training for the TM2 and all the Momentum staff.**

**h) Improving comfort on board trains stranded in the Tunnel****i) Lighting**

For the passengers of Eurostar 9053, one hour and 18 minutes elapsed between the pantographs going down, resulting in the immediate loss of air conditioning, and the start of the evacuation to the Eurotunnel shuttle. In total two hours 37 minutes elapsed between failure of the pantograph and the completion of evacuation.

For those on the 9057, the delay between pantograph failure and the start of evacuation was 37 minutes. The pantograph failed at 01.00hrs and then at 01.37hrs the passengers started to self-evacuate. The FLOR arrived at 01.56hrs.

When the pantograph fails a procedure can be taken (according to CS RAD) to protect the emergency battery and avoid wasting its energy. Both the driver of 9053 and the Eurostar manager with him were well aware of this, and the train was provided with electricity until the end of evacuation i.e. for two and a half hours. Conversely on train 9057, the supply of electricity only lasted half an hour after the pantographs failed.

**Recommendation 13:**

**13.1 We recommend that Eurostar ensures that regular training on these emergency procedures is carried out.**

**13.2 We recommend that Eurostar reviews whether current battery life is adequate, particularly bearing in mind new European regulations.**

A European regulation now stipulates that for new equipment emergency battery life should be three hours.

**13.3 We recommend that when the practice BINAT is held (postponed from January), or an alternative specific exercise, a review is carried out of the level of lighting in the carriages when on emergency power.**

The visibility of the carriage number needs to be reviewed as these are lit from the battery and it is reported could not be seen on Train 9057.

**13.4 We recommend that during the BINAT exercise, or an alternative specific exercise, the visibility of train carriage numbers is reviewed.**

It was reported that on emergency power it was difficult to read the instructions for opening the doors manually. It was also reported that it

was difficult to search the carriages to check that everybody had been evacuated.

### **13.5 Eurostar should review the provision of additional torches or other forms of emergency lighting.**

#### **ii) Ventilation and air-conditioning**

Additional consideration must be given to address the issue of air-conditioning. The temperature in the Tunnel is 25 to 28 degrees Celsius and even higher in a train full of passengers.

To ensure passenger safety, as well as comfort, maintaining the ventilation system and, if possible, the air-conditioning, is therefore essential.

#### **Recommendation 14:**

**14.1 We recommend that when the next BINAT takes place (see Recommendation 13), or an alternative specific exercise, a test is undertaken with two full carriages held in the Tunnel with the pantograph dropped to measure how quickly the temperature rises.**

**14.2 We recommend that in the short-term a joint investigation is undertaken by Eurostar and Eurotunnel into the possibility of opening a limited number of Eurostar doors with the train crew standing at each door. This review should also include any aerodynamic protection issues.**

In Section 4 – Engineering Recommendations, there are proposals about improving the arrangements for resetting the pantograph.

#### **i) Evacuation of travellers**

In order to allow passengers to evacuate the stranded train in the Tunnel in a calm and relaxed manner, taking into account the fact that there was no fire and therefore no need for extremely rapid evacuation, the train managers requested and obtained authorisation for travellers to take their luggage with them from the fire service, this being in absolute contravention of normal Tunnel evacuation rules which – it must be remembered – were written with fires in mind. This worked out well on the night of 18-19 December, but it's not without risks and therefore cannot become a general rule.



## **Recommendation 15**

**15.1 We recommend that Eurostar and Eurotunnel should review whether there are situations where it would be sensible for passengers to be evacuated with their luggage. The results of this should be submitted to the Safety Authority for approval.**

In cases where bringing luggage is refused, Eurostar has no procedures in place for retrieving passengers' luggage and returning to the passenger.

**15.2 We recommend that Eurostar puts in place procedures for handling passengers' luggage which is left on a train following an evacuation.**

It was reported by a number of passengers that smoking was taking place both on the Eurostar trains and within the Tunnel whilst passengers were waiting for evacuation. The Review recognises the problems that Eurostar staff had in trying to prevent passengers from smoking when they had been in the Tunnel for some considerable period of time. This was also compounded by the stress that a number of passengers were experiencing at that time. Equally, passengers who were on the evacuation shuttles were also smoking on the shuttles as they were initially prevented from getting off the shuttles to smoke.

**15.3 We recommend that Eurostar and Eurotunnel review what practical steps can be taken to try to prevent smoking taking place in periods of disruption.**

It is recognised that this was a difficult problem for train staff, certainly until the arrival of the FLOR who were able to impose their authority.

### **i) Transbordement processes in terminals and leaving terminals**

It was unclear to the Review Team as to where responsibility lay for looking after Eurostar passengers who were evacuated from a Eurostar train. This lack of clarity manifested itself in the case of the passengers who were on shuttles 6667 and 6668.

Other than the continued presence of first aid officers on the shuttles that arrived at Coquelles and Folkestone, passengers had no recollection of anybody walking through the shuttle, checking on their conditions and explaining what was going on.

## **Recommendation 16:**

**16.1 We recommend that Eurostar and Eurotunnel clarify their respective roles for dealing with Eurostar passengers when a Eurostar train is evacuated, including *transbordement* procedures, whether or not a BINAT has been declared. If a Eurotunnel shuttle is used to evacuate passengers to either Coquelles or Folkestone, there needs to be a process put in place to check the condition of the passengers and explain what is happening. We further recommend that this should**

**be done face to face if there has been a long delay, similar to the experience of passengers on shuttle 6667.**

The entry and exit procedures of Eurostar trains into the Eurotunnel platforms are very slow and take at least 40 minutes and can be up to one hour. The Review identified a number of improvements to aid this process.

**16.2 We recommend that Eurostar and Eurotunnel need to review whether there are any processes or procedures that could be put in place to assist the speed with which a Eurostar train can enter the Eurotunnel platforms. It is recognised that safety must not be compromised in this process.**

Transbordement took a long time in the Folkestone Terminal, owing to the number of trains that passengers had to be moved from/to. Eurotunnel only had six gangways in total to move passengers from and to the Eurostar trains.

**16.3 We recommend that Eurotunnel should obtain additional gangways for Coquelles and Folkestone.**

It is understood that Eurotunnel has already placed an order for additional gangways.

It is recognised that the shuttles are not designed to accommodate large numbers of foot passengers and there is only a limited availability of toilets.

**16.4 We recommend that Eurotunnel should review what procedures it could put in place to enable the cleaning and emptying of toilets if passengers are required to remain on shuttles awaiting transbordement in either Coquelles or Folkestone.**

### **3) Eurostar's management of trains that have failed, either in the Tunnel or on HS1 or LGV**

#### **a) Emergency plans to be revisited**

It seems very clear that Eurostar did not have adequate emergency procedures in place for managing passengers from several broken-down trains in the UK.

#### **Recommendation 17:**

**17.1 We recommend that Eurostar reviews and revises its procedures for dealing with disruption arising from an interruption in services.**

Establishing such a procedure is an urgent priority. The procedure must enable a sufficient number of well-trained staff to be rapidly mobilised in emergency situations. These procedures must be established taking into account the likely duration of the breakdown.

**17.2 We recommend that Eurostar reviews its procedures to be able to despatch a relief train quickly to transbord passengers from a failed train.**

The review needs to look at how crew, food and drink can be placed on such a train, particularly outside normal working time, i.e. late at night. The review may also see what rescue facilities could be provided by the new Southeastern Trains high-speed service.

**17.3 We recommend that Eurostar should review its method of handling delayed and evacuated passengers at St Pancras and Ashford International.**

This review could cover the provision of a welcome desk and Eurostar-dedicated help point for delayed passengers during serious delays. There should be the ability to provide food and drink and facilities for finding hotel rooms and means of transport for getting there in cases of arrivals during the night.

Eurostar may not have sufficient staff to provide these services in any extended periods of delay.

**17.4 We recommend that Eurostar puts in place agreements with Network Rail, other train operators and agencies to provide support and assistance in such emergencies.**

During the Review all the organisations in the UK that interfaced with Eurostar – British Transport Police, Network Rail, Dover Harbour Board and P&O Ferries amongst others – were unclear on Eurostar's Disaster Management Structure. Equally, it was apparent there was a lack of information about contact details for key people within Eurostar.

**17.5 We recommend that Eurostar ensures that all organisations that interface with it understand Eurostar's Disaster Management Structure (Gold, Silver, Bronze) and have the correct phone numbers and email addresses for key personnel within Eurostar.**

**b) Lessons to be learned from the handling of trains coming from Paris and Brussels which were unable to enter the Tunnel**

It was not surprising that after five Eurostars in a row had broken down in the Tunnel (the last four having entered it between 22.05hrs and 22.15hrs) Eurotunnel should demand that no further Eurostars should enter the Tunnel without technical checks being made first. Furthermore it was clear that successive Eurostars would not be able to enter the Tunnel for a substantial number of hours. The Eurostar Operations Centre

therefore tried to get these trains back to Paris and Brussels. It seems that permission to do this was refused by SNCF National HQ. Passengers therefore remained for around nine hours either at Calais-Frethun where the station was closed (the person on duty could only get there in the morning given the weather conditions) or in the open countryside, until the trains departed around 09.30hrs for Paris and Brussels. Although passengers had lighting and air-conditioning this scenario of passengers being trapped is unacceptable.

Eurostar is shortly to going to become one independent train company. When this happens, Eurostar needs to ensure that it has proper contact with SNCF's national operations centre.

**Recommendation 18:**

**18.1 We recommend that Eurostar agrees a procedure with SNCF's operations centre for Eurostar to have the ability to have a presence within the control centre in the event of major disruption.**

**18.2 We recommend that Eurostar should agree with SNCF that as a general rule trains should not be left in the middle of the countryside or in a small station overnight.**

The aim should be to send the train back to a large town (Paris, Lille, even Roissy or Marne-la-Vallee). Even if some passengers have to spend the night in the train, they will be in a large station with refreshment facilities and emergency services. Incidentally this is what happened recently with a Thalys train whose passengers spent the night in the train in the Gare du Nord.

Another barrier to sending trains back to a large station is that as a rule no TGVs run at night due to maintenance works. Granted, these works are important, but they do not take place every single night and there could be emergency situations where works could be interrupted in order to allow a train to pass.

As at St Pancras where Eurostar will need external assistance, similar situations could also arise at such stations as Eurostar might use in an emergency in France and Belgium.

**18.3 We recommend that Eurostar reviews its agreements with SNCB and puts in place agreements with SNCF for the provision of passenger assistance.**

If this is done it should ensure that passengers are properly welcomed (food and drink in stations, hotel rooms, taxis, buses and coaches). Assurances must be provided that all decisions made and courses of action taken are traceable and that they will be rigorously carried out, step by step. Finally Eurostar must study these emergency plans in partnership with the French and British authorities.

#### **4) Management of passengers in the case of reduced or suspended services**

##### **a) Queue management**

A number of passengers wrote to the Review, commenting on the fact that there were not separate queues at St Pancras for passengers going to Brussels and Paris.

##### **Recommendation 19:**

**19.1 We recommend that Eurostar studies the case for separate queues for Paris and Brussels passengers in periods of disruption.**

##### **b) Alternative transport**

Eurostar currently has 65% of the London-Paris and London-Brussels market, and therefore it unrealistic to think that it would be possible for Eurostar to have in place a replacement service that could meet the full demand, where the service is totally suspended. Eurostar therefore had reason to recommend to its customers delaying their journeys if possible. Nonetheless between 19<sup>th</sup> and 21<sup>st</sup> December Eurostar organised 4 charter flights and 95 coach transfers between Dover and Calais. This was obviously a very small contribution given the size of the problem.

**19.2 We recommend that Eurostar should prepare more comprehensive plans for handling major disruption to its service due to a Channel Tunnel closure. This should include agreeing the acceptance of Eurostar's tickets by other train companies.**

This should be done not just by working with air and rail operators and bus and coach companies, but also with the support of British and French authorities. It would make sense to ensure that these alternatives are viable in regard to the circumstances, notably weather conditions and paying attention in particular to gaps in supervision of passengers. For example foot passengers crossing the Channel by ferry found themselves at the Port of Calais in the middle of the night with no means of getting to Calais SNCF station, which is some distance away during heavy snow. A physical Eurostar presence (or a representative from a trusted third party) is essential in situations where gaps in supervision occur.

**19.3 We recommend that Eurostar reviews the possibility of organising an emergency coach service that could be put in place between probably Ashford International and a suitable Eurostar station in France, making it possible to transport passengers by ferry.**

It is recognised that such a service would be slow and of limited capacity crowded. Eurostar ought to warn passengers that this will be a slower and more complicated journey in order to manage expectations.

### **c) Improving customer information**

Information is obviously vital from the customer's point of view; however, throughout the disruption passengers faced real difficulty in accessing detailed, timely and accurate information.

#### **Recommendation 20:**

**20.1 We recommend that the customer services department and call centre should be able to offer a 24-hour service in emergency situations. The ability of the call centre to cope with high volumes of calls should also be improved. This could be achieved by drafting in additional staff, introducing a call queuing system and providing recorded updates which can be changed regularly and remotely. Eurostar should also ensure that all points of contact are joined up.**

Eurostar should also consider the introduction of a free or local rate number which would help those passengers using their mobile phone on an international tariff.

**20.2 We recommend that the website should as far as possible be updated in real time, 24/7. Updates regarding the service should also be posted more prominently. Many passengers' email addresses and mobile numbers are known so updates can be emailed or texted to them for greater convenience. Contracting additional third party support to enable this should be considered.**

A number of passengers at terminals were advised to visit the website for further information, however provision should be made for those that do not have web access.

**20.3 We recommend that within the Eurostar station terminals, a number of improvements should be made to the communication facilities. These include prominent variable message signs (particularly at St Pancras – further detail in appendix IVb); clearly visible staff; and proactive, regular announcements via the loudspeaker system.**

**20.4 We recommend that beyond these traditional means of providing information, Eurostar should make the best possible use of new forms of communication (e.g. Twitter, Facebook etc.) to ensure travellers have reliable information at their disposal.**

Whilst the message not to travel was clearly communicated during the disruption, passengers were often confused as to any alternative methods of transport available and how they might be reimbursed and compensated.

**20.5 We recommend that in case of suspension of the train service, Eurostar should also provide information on alternative means of transport.**

This might include contact details and timetables for train, ferry and airline companies. Passengers have also suggested it would be helpful to include links to relevant operators from the website.

**20.6 We recommend that as part of its communication strategy, Eurostar should ensure it provides clear and easily accessible information about the compensation available to affected passengers.**

The reimbursement policy should be communicated consistently across all channels, including within stations, by call centre staff, on the website and in any proactive email or SMS alerts. Pre-printed compensation forms should be kept on trains and at stations and distributed to passengers in case of any delay.

It is also important to consider that many passengers using Eurostar services will travel from to the terminal using local rail services. In many cases before Christmas, such passengers were not aware of the disruption until they arrived at the actual Eurostar terminal.

**20.7 We recommend that Eurostar reviews its procedures for providing information about delays to other train companies and stations.**

For example this would entail a review of the RDB system which gives information about Eurostar services to other stations in continental Europe. Equivalent systems exist within the UK.

<b>5) Need to strengthen Eurostar as an organisation</b>
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A recurring problem apparent in all areas examined by this report derives from the fact that when Eurostar is operating normally it has adequate staff to deliver a high level of customer service. However, in periods of disruption, given the large numbers of passengers it carries, Eurostar needs extra resources. Eurostar must put in place procedures for providing extra staff in such situations. Additionally, Eurostar has the complication of utilising trains which have to travel through the Channel Tunnel, requiring special safety and operating procedures.

This problem is compounded by Eurostar's complicated management structure with staff in France being the responsibility of SNCF rather than Eurostar, which leads to the fact that its staff training is not consistent across the company. The Review fully supports the plans to create one Eurostar company which should ensure better organisation and training of its staff, which will be indispensable, especially in times of crisis.

**Recommendation 21:**

**We recommend that Eurostar quickly takes advantage of the change in its organisational structure to implement the Recommendations in this Report and restore public confidence in its service which was so badly damaged as a result of the disruption on 18/19<sup>th</sup> December.**



## **Appendix I – brief summary of recommendations**

### **Train reliability**

- A number of aspects of train reliability should be considered. These range from establishing why the snow filters proved inadequate and what caused electronic failures on board, through to examining what lessons can be learnt from train operators in other countries who run trains in extreme cold weather, as well as in warm, underground conditions.
- Recommendations focus on three main points:
  - Improvement of the light maintenance and checking of the seal around the control cubicle doors
  - Protection of the electronic components: in the short term they could be protected by acrylic panels, but in the long term they could be cooled by a sealed system
  - Insulation of the inductors and redesigning of the roof of the power car
- Specific recommendations have been made concerning air conditioning on board the trains. The failure of the air conditioning caused serious discomfort and distress to passengers and the Review has recommended that this issue be addressed as a priority. This should be done by reviewing how the pantograph can be raised safely and independently.

### **Evacuation and rescue procedures**

- Eurostar's and Eurotunnel's emergency procedures quite rightly deal with how to evacuate in the event of fire, or some other serious event but do not appear to satisfactorily address the potential need to evacuate a Eurostar train for other reasons: such as the loss of air conditioning, lighting or other sanitation factors.
- For this reason, the Review has recommended that Eurostar and Eurotunnel carry out an urgent review of their current procedures for evacuating a train in the event of power failure, particularly where air conditioning is lost. This should include:
  - An investigation into the possibility of train crews opening a limited number of Eurostar doors and manning them in the event of a breakdown in the Tunnel
  - A review into the safety implications of allowing passengers to be evacuated with their luggage in certain situations
  - Improvements to lighting. A review of the current battery life of emergency equipment should be carried out, as well looking at the adequacy of lighting in carriages running on emergency power
- There also needs to be better crisis communication between Eurotunnel and Eurostar when there is disruption in the Tunnel. The

Review has recommended a video link is set up between the two companies' crisis control centres.

- The facility should be introduced, as soon as possible, for Eurostar and other railway companies to be able to communicate with their train managers when trains are inside the Tunnel. The Review has recommended the installation of GSMR as a matter of priority.
- The Review has also recommended a series of measures to improve communication with passengers in an emergency. These include the following:
  - The Train Manager should broadcast a safety briefing for passengers when a train stops in the Tunnel and could be delayed for some time. If the train needs to be evacuated, the Train Manager should provide instructions for passengers to follow
  - Passengers should be briefed on the layout of the rescue train they will be boarding, so they aren't confused about its layout and know where they will be located
  - Train Managers should wear high visibility vests so passengers and rescue staff can identify them in an emergency and catering crews should be trained to help evacuate the train in an emergency
  - A new emergency line should be set up at Eurotunnel's Rail Control Centre so that the Train Manager can relay feedback on passenger issues on board, as well as communicate information back to passengers
  - Train Managers should be given special stress-management training, similar to that given to airline crews. This should teach them how to address, inform and reassure passengers during disruption and should be carried out in both English and French
  - A review by Eurostar and Eurotunnel should be conducted to see what practical steps can be taken to stop passengers smoking in the event of a breakdown, although it is our view that better communication with passengers by train staff is key to reducing stress and panic

### **Managing disruption and improving communication**

- It is clear Eurostar did not have adequate emergency procedures in place for managing major disruption to its services. The Review has therefore recommended it reviews and revises its procedures as a priority.
- Eurostar must put in place a system to mobilise a rescue train quickly, with sufficient well-trained staff, in emergency situations.
- Such a review must also look at how crew, food and drink can be placed on rescue trains, particularly outside normal working hours.

- The Review has set out the following specific recommendations:
  - Customer service departments and call centres should be able to offer a 24 hour service in an emergency and the ability of call centres to manage high volumes of calls should be improved
  - Eurostar should consider the introduction of a free or local rate number which would help those passengers using their mobile phone on an international tariff
  - Eurostar's website should, where possible, be updated in real time, 24/7 and updates on the service should be posted more prominently
  - Eurostar should look at using passengers' emails and mobile numbers to email or text them updates in an emergency and help keep them informed of developments. They should also consider new forms of communication, such as Twitter and Facebook, to keep passengers updated
  - Improvements in communications should be made at Eurostar terminals, including prominent message signs, regular announcements via the loudspeaker system and staff in high visibility vests
  - Where the service is suspended, we recommend Eurostar should provide information on alternative means of transport for passengers, as well as providing its own limited coach service for passengers where necessary and providing links to other transport operators from its website
  - Clear information on compensation should be made available to passengers across all channels: for example, at stations, on board the train, by call centre staff and on the website
  - There should be better handling of delayed and evacuated passengers at Eurostar terminals. The Review has recommended setting up a Eurostar Welcome Desk and dedicated Help Point for delayed passengers during serious delays. Food and drink should be made available and help should be given to passengers with finding accommodation and transport in case of arrivals during the night
  - There should be an agreement between Eurostar and other train companies on the acceptance of Eurostar tickets, as well as wider help for passengers who need extra assistance in the event of a train breaking down
- Finally, the review has stated its support for Eurostar's plans to improve its organisational structure. The Review has recommended that it takes advantage of these changes to implement the recommendations contained in the Review and to restore public confidence in its service

**Appendix II - list of people interviewed by Christopher Garnett and M. Claude Gressier**

<b>Surname</b>	<b>First name</b>	<b>Company</b>	<b>Job Title</b>
Adams	Andy	Kent Police	Assistant Chief Constable
Adrianssens	Alain	SNCF du Landy	Directeur du technicentre
Bertrand	Alain Henri	Eurotunnel	Directeur de la circulation ferroviaire et ancien d'Eurotunnel
Chapman	Paul	HS1	Managing Director
Clifton	Richard	IGC	Head of UK Delegation
Cooke	Janet	London Travel Watch	Chief Executive
Cooksey	David	LCR	Chairman
Crowther	Dyan	Network Rail	Route Director
Damas	Jacques	SNCF	Directeur Sécurité et Qualité ferroviaire
Deeble	Helen	P&O	Chief Executive
Doddridge	Robin	Dover Harbour Board	Director of Corporate Operations
Dolding	Tony	Kent Police	Channel Tunnel Policing Unit Inspector
Gaborit		Sous Prefet de Calais	
Garde	Alain	SNCF	Directeur National des Opérations
Gisby	Robin	Network Rail	Director, Operations and Customer Services
Goldfield	Bob	Dover Harbour Board	Managing Director
Gounon	Jacques	Eurotunnel	Chairman & CEO
Griffins	Roy	IGC	Chairman (UK)
Hart	Stanley	ORR	Head of Inspection, South East
Hewson	Gavin	Hertforshire NHS	Paramedic

Horton	Alan	Kent Police	Chief Superintendent, Tactical Operations
Keefe	John	Eurotunnel	Director of Communications
Kemp	Roger	Lancaster University	Professor (Engineering) FREng
Killick	Mark	Network Rail	Property Works Manager
Lockett	Richard	Passenger 9057 (Ex-Disney)	
Levert	Francois	Eurotunnel	Operations Manager
Lowe	Caroline Lowe	Sussex Police	Emergency Planning Officer, Gatwick Airport
Lyttle	Andrew	Kent Police	Head of Frontier Operations
Mayger	Dave	Mott MacDonald	Principal Mechanical Engineer
Mercado	Tony	DfT	Director of Rail Technical & Professional
Mouly	Philippe	SNCF	Voyages
Nattrass	Jim	British Transport Police	Superintendent
Newton	Mark	British Transport Police	Chief Superintendent
Parent	Christian	IGC	Chairman (France)
Pointon	Dave	LCR	Technical Advisor
Powney	Emma	Passenger 9057 (Ex-Disney)	
Richardson	Kevin	Dover Harbour Board	General Manager
Rollin	Michel	Alsthom	Ingénieur
Sainson	Pascal	Eurotunnel	Director of Operations
Sedgwick	Chris	Essex Police	Police Officer
Smith	Anthony	Passenger Focus	Chairman
Souvras	Jean-Alexis	Eurotunnel	Director of Public Affairs
Sturdy	Zoe	Passenger 9057 (Ex-Disney)	

Tissier	Dominique	SNCF	Direction du Matériel
Trotter	Andrew	British Transport Police	Chief Constable
Wilkins	Robin	Sea France	Managing Director
Williams	Gareth	DfT	Director MPD (Major Projects Division)

### **Appendix III - report on passenger responses**

The Review has had an excellent response from Eurostar passengers. In total we have received more than 700 letters and emails, providing invaluable input into the inquiry.

These include detailed accounts from over 60 passengers who were on the trains that failed during the night of the 18<sup>th</sup> and the trains that were diverted during the disruption on the 18<sup>th</sup> and 19<sup>th</sup> December. The detailed information within these accounts about the conditions on the trains has been very important in informing the Report and formulating its recommendations.

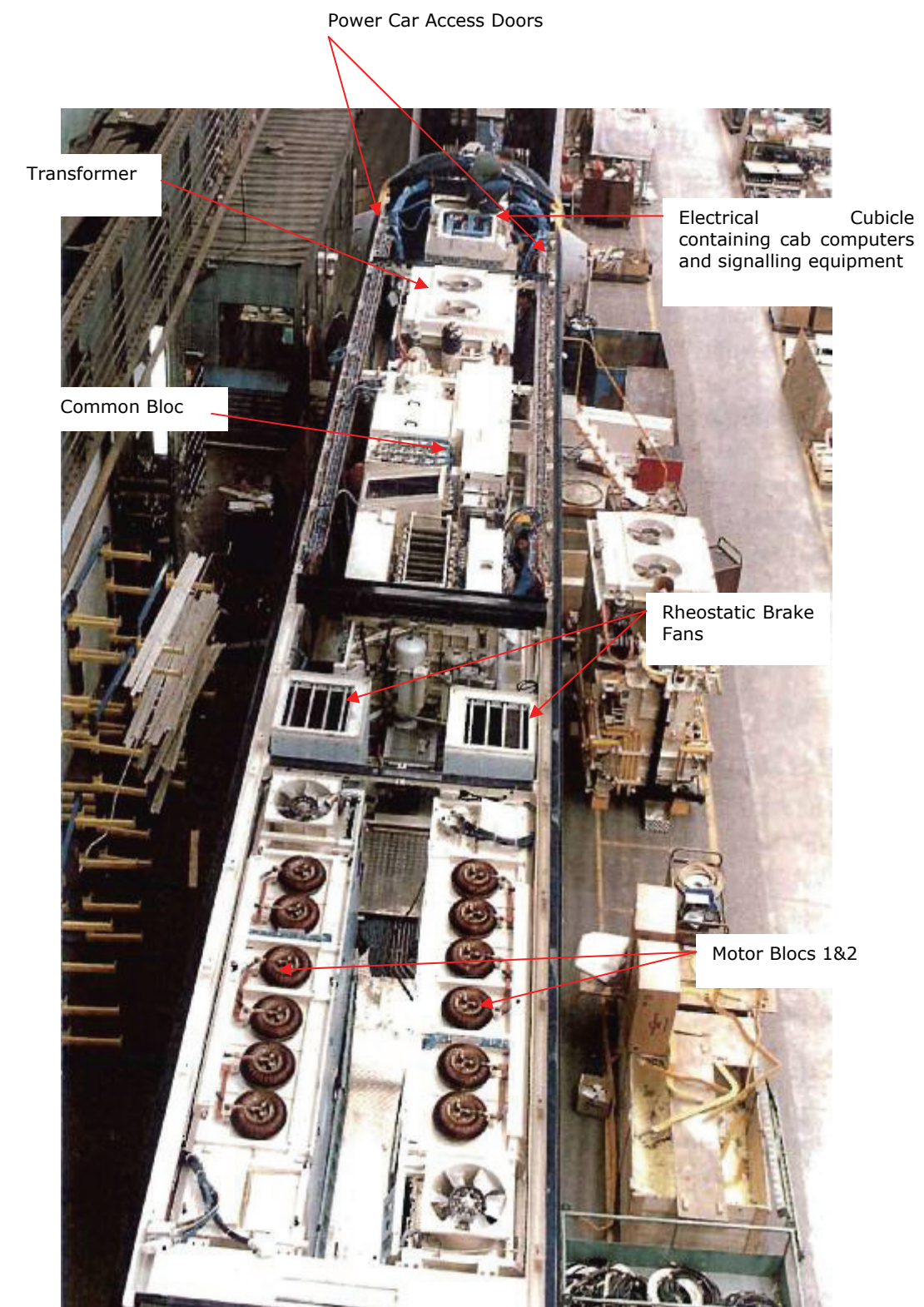
In addition, some 400 passengers provided accounts of how they were affected by the ongoing disruption in the week leading up to Christmas. These included passengers travelling from each of the main terminals: St Pancras, Paris Gare du Nord and Brussels-Midi, as well as Lille, Ashford International and Ebsfleet. These passengers have provided detailed feedback regarding how the disruption was managed in each of the stations, as well as on the wider provision of information and assistance by Eurostar.

Many regular Eurostar passengers wrote to us to provide wider feedback on the service, in particular relating the management of previous disruption.

We are grateful to all for their time and assistance.

## **Appendix IV- pictures**

### **a) Eurostar power car layout:**





**b) Signage at St Pancras:**

The Review recommends that a variable message sign is put up in the International Arcade where currently there is a Eurostar banner (see photo below):



The need for passenger of information of this sort becomes even greater if other passenger operators were to start to use the Channel Tunnel. At the same time, the Passenger Information Points, in periods of disruption need to be able to give messages, either for Eurostar or for the other operators in the station. Currently, the PIP shows either advertising or information about the station security (see photo below).

