
Between 17 January and 22 January 2015, there were repeated disturbances in cross-Channel traffic as a result of four serious incidents – a fire on a HGV followed by three catenary trips.

In accordance with the seriousness of these events, and as a part of the ongoing collective thinking it is carrying out to ensure the flow and safety of traffic and improve user satisfaction; the IGC asked Mssrs. Claude Gressier and Chris Gibb to conduct an independent investigation regarding the handling of the disturbances, and in particular how communication issues had been managed by the stakeholders.

The IGC is currently considering the implementation of the recommendations contained in the report.

2 July 2015

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Report Contents

I Introduction

1. Following on from the fire on 17 January 2015 on board a freight shuttle in Interval 4 of Running Tunnel North in the Fixed Link and the ensuing service interruptions on 18, 21 and 22 January, the Intergovernmental Commission (IGC), decided to launch an independent inquiry with the overall aim of analysing how these incidents were handled by the infrastructure manager and the consequences of these actions on the railway undertakings.
2. We were charged with carrying out this inquiry and this report contains our main observations and proposals.
3. We should stress that we were not asked to analyse the safety aspects of the sequence of events as this is the responsibility of the BEA-TT. The latter has already commenced its investigation of this matter. However, we felt it would be useful to compile a short section on technical incident handling to record some observations on our part.
4. We have made some suggestions concerning the technical problems encountered by Eurotunnel and which may have caused the incidents, on monitoring service quality in the Tunnel and on the communication and information problems experienced by the various stakeholders: the public authorities, Eurostar, Eurotunnel's major customer, the other railway undertakings, private car passengers and the press. We should also stress at this point that Eurotunnel and Eurostar have been working together constructively for quite a while now, providing excellent service quality for their customers the majority of the time. However, improvements are required.
5. We should also draw the IGC's attention to the fact that the Channel Tunnel is the main link between the United Kingdom and the continent, be it for individuals or for freight, and the only fixed link. Any incidents therefore have considerable repercussions which will inevitably affect the public authorities. Of course, there will also be significant repercussions for direct and indirect clients, and equally on traffic in the vicinity of the Tunnel in both countries, migrants targeting the queues of HGVs in France and the quality of life experienced by local residents. All of this means that the IGC has a duty to make sure that Eurotunnel is providing good service quality. This also means that the public authorities cannot expect Eurotunnel to be solely responsible and that they must consider Eurotunnel's future development and take on board the material consequences, specifically with regard to road infrastructure, and also secure areas for waiting HGVs, especially in the case of disruptions.
6. Train services using the Channel Tunnel, whether for passengers, cars, freight or lorries, generally operate very punctually and reliably in comparison to other European rail networks, although this is difficult to evidence from the limited performance information published by Eurotunnel. The services are increasingly popular and well used, and customers have become accustomed to a competitive and dependable service. However when there is disruption it is often significant, with very material impacts on the users and many other people in the UK and France, as we set out in this report.

Claude GRESSIER

Chris GIBB

EARLIER REVIEW RECOMMENDATIONS

7. As a starting point we considered what previous reviews had been done concerning the management of disruption in the Channel Tunnel. The most significant and relevant past review is the “Eurostar Independent Review”, published on 12th February, 2010, and written by Christopher Garnett and M. Claude Gressier. This review looked at the circumstances that caused the failure of five Eurostar trains in the Channel Tunnel on 18th/19th December, 2009, and the management of the subsequent disruption. As the seriousness of the disruptions was becoming increasingly visible, the independent review was commissioned by the Board of Eurostar, and was mandated by the UK and French governments once the seriousness of the disruption was apparent.
8. The Eurostar Independent Review made 21 recommendations to be considered primarily by Eurostar, but also by Eurotunnel and other parties. We reviewed these recommendations with both Eurotunnel and Eurostar. In all cases we found that the recommendations had been considered, acted on by both parties and formally closed. In some cases after consideration it was decided not to adopt a recommendation, with the reasons recorded before the recommendation was considered closed. We saw no evidence to suggest that the application of the recommendations had diminished over time since 2010.
9. We note the following decisions that have been subsequently made and recorded in respect of recommendations relevant to our current review.
10. Recommendations 6, 7.4, 7.5, 7.6 and 7.8 concerned the evacuation of passengers on Eurostar trains in the Channel Tunnel to Eurotunnel tourist shuttle trains. Eurostar and Eurotunnel have agreed that under no circumstances will this happen in the future. In the event of a Eurostar train being unable to move under its own power in the Channel Tunnel the approach will involve, in the following order, rescue by Krupp locomotives, rescue by empty Eurostar train, rescue by loaded Eurostar train, and, as a last resort, evacuation to the service tunnel, and thence to another Eurostar train. In each case the failed train will be taken to Ashford International or Calais Frethun. Eurostar have outlined to us how an empty Eurostar, equipped with food and drink, would be quickly despatched from the nearest possible location, probably St Pancras International, to achieve these outcomes within a satisfactory timescale (recommendation 17.2). Eurotunnel explained to us that they would prefer to have an empty Eurostar train set located at Folkestone to, in their view, achieve these outcomes quicker. The two parties continue to discuss this possibility, as the arrival of Eurostar’s new trains may make this an option. However the logistics of maintaining a single train set at Folkestone, of a complex type unfamiliar to Eurotunnel crews and maintenance teams, in a state of continual immediate readiness (but rarely actually moved), and equipped with food and drinks, should not be underestimated.
11. Recommendation 17.1 concerned Eurostar’s procedures for dealing with disruption arising from an interruption in services, including in the Channel Tunnel. We reviewed Eurostar’s internal procedures, contingency plans and publications, and discussed these with Eurostar employees charged with implementing them. We also heard about the handling of recent incidents, and were present at St Pancras International during disruption on 21st April caused by a catenary incident in the Channel Tunnel.
12. Recommendation 10.1 concerned the provision of a communications post in Eurotunnel’s RCC to deal specifically with passenger issues that may arise on a train that is stopped in the Channel Tunnel for any length of time. We observed this post in place during a visit to the

RCC. We also note that communications between passengers in the Channel Tunnel and other parties outside the Tunnel are much improved since the installation of mobile phone reception in both tunnels.

13. We have concluded that Eurostar has embraced the recommendations of the February, 2010 Review, and incorporated them as “business as usual”. We observed a strong culture of customer service, with effective communication during disruption at the heart of this. The lessons learnt from the December, 2009 incident should not be forgotten as they slowly diminish from corporate memory, but grow in importance as passenger volumes steadily increase.
14. Having considered the recommendations of the 2010 Review, we have no further recommendations to make as part of this new Review into the Management of Disruption in the Channel Tunnel.

II Timeline with comments

15. All the times specified in this timeline are expressed as Continental times.
16. Eurotunnel sends text messages containing general information to the managers of road haulage fleets, lorry drivers and private car clients who have booked in advance and provided their mobile number.
17. Tweets are addressed to all “followers”, who may be Eurotunnel’s direct customers (as mentioned in the previous sentence), but also indirect customers, e.g. Eurostar customers.
18. Eurotunnel also sent text messages and tweets to specific people to provide local information or in response to specific requests.

Saturday, 17 January 2015

12:00: Catenary circuit breaker trip in the UK terminal and Running Tunnel North as Heavy Goods Vehicle (HGV) shuttle 7340 enters the Tunnel.

12:22:50: Detection station No. 38 at CP 3912: smoke alarm and carbon monoxide (CO) detected (300 ppm).

12:23:16: The driver of Mission 7340 makes an emergency call to the Eurotunnel Rail Control Centre (RCC) to report a fire alarm on a wagon.

12:23:56: Further emergency call by the driver of Mission 7340; the RCC asks him to stop in the Station d’Attaque de Feu (SAFE station). The driver replies that he has just passed it and that he intends to perform a “stopping train” procedure.

12:26: Controlled halt of Mission 7340 at CP 4418 in Interval 4. First Line of Response (FLOR) activated. GCC and technical emergency unit activated.

The RCC notifies the Centre Opérationnel départemental d'Incendie et de Secours (CODIS) (French Departmental Fire and Emergency Operations Centre) and the Police de l'Air et des Frontières (PAF) (Air and Border Police) at this juncture, along with Kent Fire and Rescue Service (KFRS).

The area commanding officer of the French regional fire and rescue service, reports that Eurotunnel has informed him that there is only some smoke and a low temperature. However, the CO detector displayed a value of 300 ppm, which he felt was quite high and explains why he immediately deployed the first two resource levels to cover the possibility of a fire.

Kent Fire & Rescue Service (KFRS) also uses the term “fire” in its initial internal communications.

12:30: Start of operation to evacuate HGV drivers from the shuttle.

12:37: End of evacuation.

12:37: Eurostar is informed of the incident, described as: “Smoke release in the North Tunnel”.

From this point, constant, but not precise enough, telephone communication was maintained between Eurostar and Eurotunnel.

Apart from the exchanges between the Eurotunnel RCC and the Eurostar Control Centre (CRE), there were a great many telephone conversations between the Chief Operating Officer or the Director of Scheduling and Railway Operations from Eurotunnel and the Director of Operations Delivery from Eurostar.

However, although Eurostar was always kept informed about what was happening in the Tunnel, it did not have access to the tool for real-time monitoring of traffic inside the Tunnel and on the Tunnel approaches (but only to the “Wistoc” tool which provides the information with an 8-minute delay), even though it has access to this information for HS1 and the French rail network. Eurostar still does not have access to this system, despite Eurotunnel promising to grant access. This is clearly extremely important for Eurostar trains to run properly and thus for Eurostar’s customers, who are also Eurotunnel’s indirect customers.

12:41: Text messages sent up to this point were intended for customers on the Eurotunnel trains stuck in the Tunnel.

12:50: French Second Line of Response (SLOR) arrives at French Fire Equipment Management Centre (FEMC).

13:12: Three evacuation Service Tunnel Transit System vehicles (STTS) head down the service tunnel towards CP 4418.

Having been dispatched to evacuate the HGV drivers from the service tunnel, these STTS and their drivers are no longer available to take the firefighters to the scene of the incident. This led to the loss of approximately one hour in getting the French firefighters to the scene of the incident and thus in them being able to start fighting the fire. Eurotunnel may have thought that there was sufficient time to evacuate the

HGV drivers from the service tunnel before taking the firefighters to the scene in view of the information from the RCC, which referred to smoke and low temperatures, rather than specifying flames and fire.

13:15: The RCC gives permission for the “Salamander” procedure to be implemented.

13:30: The Sub-Prefect arrives at the Operational Control Centre (“*Poste de Commandement Operationel ,PCO*”).

13:36: First tweet stating that departures have been suspended in both directions due to an incident in the Tunnel.

The Sub-Prefect of Calais was notified at around 13.20 by the duty-sub prefect, who had himself been notified by the French fire service (*Centre Operationel d’Incendie et Secour, “CODIS”*), and he received an informal telephone call to the same effect from Eurotunnel at around 13:23.

He notes that the HGV drivers have been evacuated from the shuttle and asks, during the *retour d’expérience* (REX) organised by Eurotunnel and held in February, to be informed immediately of any future evacuation procedures.

He also confirms that the information received from the RCC reported smoke and low temperatures, rather than flames.

13:48 : Kent Police tell Highways England that a fire on a train in the Channel tunnel is severely disrupting services.

13:55: According to the KFRS timescale of the incident, confirmation of a fire towards the front of the shuttle is received at this point along with confirmation that the Salamander procedure is underway.

14:00: General text message stating that service has been suspended due to an incident in the Tunnel.

14:12: Tweet stating that the carbon dioxide (CO₂) detectors have been activated.

This indicates smoke or fire.

14:28: General text message identical to the message issued at 14:00.

14:30 : Eurotunnel Duty Manager advises Highways England that Eurotunnel service is « suspended », but Channel Tunnel is not « closed » : UK motorway signing updated to report this to drivers.

14:34: Identical general text message, but with a request to postpone journeys.

14:36: The French SLOR is in action at CP 4418.

According to a report written by the Head of the UK SLOR, the latter had taken up a position in the middle of the Tunnel and received the order by the Eurotunnel FDC to

go to the scene of the fire in order to assist the firefighters present. The UK SLOR thus proceeded to the scene of the fire but, on arrival, received information that the BINAT had not yet been activated and they thus withdrew to the middle of the Tunnel.

It was shortly after this that the UK FLOR heard banging on the door to CP 4370. A precise time is not given for this banging, but the KFRS timescale places this at 16:12. This therefore corresponds to the activation of BINAT by the Sub-Prefect of Calais which happened several minutes after hearing of this banging on the door, suggesting that there might be people in the Tunnel.

15:00 : Motorway J11A at Folkestone closed by Kent police, closing access to the Eurotunnel terminal.

15:36: General text message identical to the message issued at 14:34.

15:44: Confirmation by the SLOR of the presence of two HGVs on fire at the end of the front rake.

15:58 and 16:06: The Eurotunnel Director of Public Affairs, responsible for all Eurotunnel external communications in the UK, who had received a call from the Kent police asking him to confirm that there was a fire in the Tunnel according to KFRS, sent two e-mails to the KFRS communications department asking this department not to mention the fire. This fire was confirmed at 15:44 and the Eurotunnel director of public affairs's e-mails were after this, but he still had not been informed of the fire.

16:17: Binational safety incident (BINAT) "GO" activated.

The Sub-Prefect launched the BINAT GO a few minutes after a message was sent to the RCC noting that banging on the door of CP 4370 had been heard.

16:37: Confirmation by the SLOR: "Fire under control".

17:12: General text message identical to the message issued at 15:36.

This general text message is sent 1 hour 30 minutes after the previous text message and is the last to be issued before the message sent at 8:52 on 18 January.

17:45 : UK motorway signing amended to say « long delays at J11A » allowing HGVs to access Eurotunnel.

17:52: BINAT "STOP" declared.

The Sub-Prefect of Calais appears on television stating that there has been a fire in the Tunnel, but that it was not a major fire and that it was well under control.

18:05: The SLOR informs the PCO that the shuttle will have to be sprayed for several hours to cool it down.

18:12 and 18:14: Tweets stating that the fire on the freight shuttle has been contained by the fire services and that an inspection of the Tunnel is underway and that Eurotunnel anticipates resuming services that evening.

Note that Eurotunnel acknowledges that there has been a fire in these tweets and that it hopes to resume services that evening, which is very optimistic, especially given the information issued by the SLOR on the time required (several hours) to cool down the shuttle.

18:50: The French Public Prosecutor appoints a legal expert and asks him to inspect the shuttle in the running tunnel before it is removed.

Eurotunnel justifiably points out that, if necessary, the regular legal experts should be appointed so that they are familiar with the Tunnel and its specific features. This would avoid wasting time at customers' expense.

19:00 : Kent Police convene a Strategic Co-ordination Group conference with Highways England and other parties to review events.

19:36 : Eurostar sends an internal message stating that the damaged shuttle will be removed from the Tunnel and that repairs will take place overnight. This message suggests that trains should be able to use the Tunnel the following day and that there will be no train cancellations.

20:09 : Kent Police advise Highways England that Operation Stack is not required at this time as Eurotunnel were saying a limited service would resume shortly.

21:59: Tweet stating that Eurotunnel will operate a reduced service the next day.

23:07 : Kent Police tell Highways England that Eurotunnel have advised them that North Tunnel expected to be closed for 24/48 hours.

23:10: Tweet stating that the next day's departures will be available from 06:00 (UK time).

Sunday, 18 January

00:50: Tweet stating that the resumption of services has been delayed to ensure that there is no residual smoke in the Tunnel.

01:05: Tweet identical to the tweet at 00:50.

00:35: The legal expert authorises the damaged shuttle to be removed from the Tunnel.

There is no doubt that this legal procedure (no follow-up) delayed, by two or three hours, the removal of the damaged shuttle from the Tunnel and the reopening of the South Tunnel.

03:15 : Eurotunnel advise Kent Police and Highways England that limited services resuming with immediate effect.

03:32: Tweet stating that service will resume at 02:45 UK time, i.e. 03:45 French time.

03:45: Commercial operations recommence in the South Running Tunnel.

08:52 and 08:54: Text message stating that service has resumed in just one of the tunnels.

09:27: Catenary circuit breaker trip in Interval 1, no trains present. Catenary damaged over a distance of approx. 150 metres.

Broken pieces of the catenary “flying tail” were discovered on this occasion. When these pieces were analysed in an SNCF laboratory, it was discovered that they had corroded, and that his corrosion was located in the cable core, which did not allow it to be detected by simple visual inspection. Eurotunnel thus decided to replace the 12 flying tails in the wet areas.

09:40: Text message saying that there has been a controlled halt of one (or more) shuttle(s).

09:52: Eurostar is informed that the Tunnel has been closed again due to a problem with the catenary in Interval 1.

09:53: Interval 1 is closed for inspection.

10:12: Tweet announcing that Eurotunnel passenger services are subject to waiting times.

10:26: Identical text message to the message sent at 09:40.

10:30: The duty manager authorises a return to operation of Interval 2. Operations thus continue in Intervals 2, 3 and 5.

10:47: Text message apologising for the delay and stating that every effort is being made to resume service.

10:56: Text message apologising for the delay and wishing passengers a good trip.

11:10: Eurotunnel informs Eurostar that Eurostar trains cannot enter Interval 2 until a test train has passed through. This train is scheduled for 11:30.

11:33: Identical tweet to the tweet sent at 10:12.

11:49: Eurostar trains are allowed to enter the Tunnel.

This information, and Eurotunnel's communications with the press, in particular, demonstrate that this new incident was played down by Eurotunnel, even though there was a complete closure of the Tunnel for at least an hour for shuttles, and just over two hours for Eurostar. It even appears that Eurotunnel’s spokespersons, particularly the French spokesperson, blamed the delays to Eurostar trains on Eurostar’s poor management while claiming that the tunnel was open.

12:42: Tweet stating that there is a reduced passenger shuttle service and asking customers to arrive on time.

12:44: Eurotunnel tweet suggesting that passengers should transfer to the ferries.

13:00, 13:05: Identical text messages stating that Eurotunnel is offering a reduced service in view of Saturday's incident.

13:06 and 13:57: Tweets stating that there are lengthy delays and suggesting that those who don't need to travel urgently should postpone their journeys.

13:10, 14:01, 16:20, 16:25, 18:19, 18:23: Text messages specifying the length of the delays at Calais and Folkestone.

16:05, 16:10, 19:32: Tweets specifying the length of the delays at Calais and Folkestone.

19:51: Tweet noting that the Tunnel will not be fully operational until Tuesday.

This tweet suggests that the Tunnel will operate as usual during the day on Tuesday, which proved to be inaccurate.

And yet, at the same time, the Chief Operating Officer from Eurotunnel told the Director of Operations Delivery at Eurostar that repair work on Interval 4 would come to an end on Wednesday morning(in the best-case scenario).

19:53 and 19:58: Optimistic tweets suggesting that Eurotunnel hopes to use 2/3 of the North Tunnel in the near future.

21:50: Operations resume in Interval 1 following the catenary repair work. Only Intervals 4 and 6 are closed for operation.

23:30: Internal Eurostar message stating that repair work will take place tomorrow in Interval 4 of the North Tunnel after yesterday's incident.

Monday, 19 January

05:45: Operations resume in Interval 6, which was used to evacuate the affected train to the French terminal.

08:23, 08:24, 09:37, 09:46, 09:47, 13:34, 13:36, 13:41, 17:01, 19:31: Identical text messages stating that Eurotunnel is putting on a reduced service in view of Saturday's incident.

09:12, 11:07, 11:13, 11:28, 16:05, 16:10, 18:30: Tweets stating that there is a reduced service and specifying the length of delays; also providing information on traffic on the English motorways.

Note that Eurotunnel does not offer any anticipated reopening times for Interval 4.

22:50: Internal Eurostar message predicting the same situation for the next day.

Tuesday, 20 January

08:32: Tweet stating that there will be congestion around the Folkestone terminal area.

08:37: Tweet reporting that a restricted service will apply today too and apologising for this situation.

Eurotunnel notes that repair work in Interval 4 will take longer than it had expected.

09:26, 11:35, 11:38, 15:50, 16:14, 17:31: Text messages providing similar information to the above tweets.

09:41, 10:26, 11:17, 12:35, 13:38, 13:43, 14:43, 16:08, 17:01, 18:30, 18:45: Tweets stating that there is a reduced service, reporting a minor incident, specifying waiting times at the terminals, and providing information on traffic on the English motorways.

Note that Eurotunnel continues to make no predictions about when the Tunnel will be fully back to normal. This must be very confusing for both direct and indirect customers.

As a consequence, there are no internal messages from Eurostar predicting when normal services might resume.

23:50: The duty manager authorises operation of Interval 4.

Wednesday, 21 January

00:03:25: Catenary circuit breaker trip in the North Tunnel.

00:03:48: New catenary circuit breaker trip. Mission M 7572 reports a flash from the catenary accompanied by a bang. The driver reports that he has stopped at PK 4464 in the area repaired after the fire on 17/01/2015.

00:05: Operations are only continuing in Intervals 1, 2, 3 and 5.

00:18:00: The driver reports that a window has broken on the front locomotive: it is suspected that the catenary has fallen down.

00:52:00: Confirmation that the catenary has fallen down.

This incident was caused by a porcelain insulator which may have caused the catenary to break free. Insulators in this area had been inspected, though some had not been tested but simply visually examined, and any with faults had been replaced. However, this insulator had certainly been weakened by the high temperatures caused by the fire. After this incident, all insulators in this area were replaced. This incident reminds us that the high temperatures caused by a fire, even if not a particularly large fire, are extremely destructive and that ongoing visual inspections are not always sufficiently reliable.

02:22, 05:33: Text messages apologising for the day's delays.

07:10: Several text messages mention unscheduled maintenance.

07:31, 07:35, 09:00, 09:02: Text messages stating that the reduced service is due to Saturday's incidents.

In the UK Operation Stack Phase 2 is implemented, between Maidstone and Ashford, and remains in force until 24th January, 2015.

08:18, 08:26, 09:17, 10:43, 12:39, 13:28, 16:29, 18:31: Tweets reporting reduced operation, noting delays and congestion on English motorways.

08:34: In an internal message, Eurostar reports that Intervals 4 and 6 are closed due to a new failure.

09:00: The Eurostar Director of Operations Delivery telephones the Eurotunnel Chief Operating Officer who informs him that Interval 6 should be reopened during the course of the day and that only Interval 4 will be closed, with the outlook for Friday still uncertain.

13:30: Further call from the Eurostar Operations Delivery Director to the Eurotunnel Director of Scheduling and Railway Operations who tells him that Interval 6 will not be restored before tomorrow morning.

16:40: During a further call between the Eurostar Operations Delivery Director and the Eurotunnel Director of Scheduling and Railway Operations: Eurostar learns that Interval 6 might be opened mid-morning on Thursday.

19:09: Tweet reporting that 4 intervals are currently in operation and that Eurotunnel hopes to be operating with 5 intervals the following day.

16:40, 16:42, 19:12, 19:14, 19:18, 21:26: Text message basically stating that Operation Stack is in place in the UK.

Eurotunnel has become very cautious with its announcements and now offers only very vague operating predictions for 5 intervals, although without specifying approximate times and making no further mention of the prospects for returning to normal operation.

Thursday, 22 January

08:45: Text message pointing out that reduced operations still apply following Saturday's incident.

09:55: Tweet repeating the information from the text message at 08:45, i.e. that reduced operations still apply following Saturday's incident.

10:10, 10:15: Tweets providing information on HGV traffic organisation at Calais and reminders of Operation Stack in the UK.

10:30: The Eurostar Operations Delivery Director calls the Eurotunnel Chief Operating Officer who informs him that work in Interval 4 has finished, but that Eurotunnel needs to carry out tests in the early afternoon before reopening, with the speed limited to 100 km/h for several days.

11:30: Operation of Interval 6 authorised. Operations continue in Intervals 1, 2, 3, 5 and 6.

Eurotunnel does not seem to have made any announcements to this effect.

12:07: Tweet reiterating the fact that there is a reduced service.

17:44: The duty manager authorises operation of Interval 4 with a partial speed restriction to 100 km/h.

17:50: Internal Eurostar message stating that Interval 4 is now open again.

This announcement shows that there is a good flow of information between Eurotunnel and Eurostar.

19:15, 19:28: Tweets stating that the passenger shuttle service is improving, but that the freight service will not be restored immediately due to the severity of the disruption.

The realistic nature of this message should be noted.

19:36: Catenary circuit breaker trip in Interval 4, which is closed whilst work continues.

19:44: Internal message from Eurostar stating that it has just received a message from Eurotunnel that there is a problem with the catenary in the North Tunnel. Eurotunnel tries to reset the system and contacts Eurostar to provide more information.

Confirms a good level of communication between Eurotunnel and Eurostar

21:06: The catenary break is confirmed. It appears that one of the cables wasn't connected correctly.

Our only comment in this connection is to stress the severity of the fire and the importance of taking the necessary time to ensure that all the resulting damage is repaired fully.

21:05: Text message reporting a technical problem and stating that the technicians are dealing with it.

There doesn't seem to have been any information on this new incident although, admittedly, this had no consequences other than extending the period of reduced operation. However, there is no longer any question of returning to normal operation. After 21:00 in the evening, there are several internal Eurostar messages stating that Interval 4 has been closed until further notice.

Friday, 23 January

07:00: The duty manager gives permission to test Interval 4 after an in-depth inspection of the equipment.

08:30: The Eurostar Operations Delivery Director calls the Eurotunnel Chief Operating Officer who informs him that Eurotunnel needs to carry out more tests this morning before reopening.

07:49: Internal Eurostar message stating that Interval 4 is still closed.

09:35, 10:09, 11:07, 11:29, 11:35, 13:25: Text messages stating that there has been a new problem in the Tunnel, which, although now resolved, means that reduced operations still apply.

10:05, 10:10, 13:07: Tweets confirming that reduced operation still applies.

11:30: The duty manager authorises operation of Interval 4. 10 shuttles travel through Interval 4 before an empty Eurostar goes through for the first time.

11:56: Eurostar message stating that Interval 4 is now open again, but with a speed restriction of 100 km/h.

13:55: Tweet reporting that repairs to the infrastructure are progressing well.

14:51: Tweet announcing the end of delays to passenger shuttles.

15:17: Text message stating that there are no further delays.

19:10, 23:06: Reminder that Operation Stack is still in place.

The density of HGV traffic arriving at the Folkestone terminal is a huge issue in the UK. It is clear that this affects the residents of this area, road haulage operators and their drivers, and also their customers and Eurotunnel itself. In France, queues of lorries form whenever an incident disrupts the operation of the Tunnel, with the result that the lorries are beset by migrants hoping to travel to the UK. This is why the capacity of the Tunnel and the ferries for transporting HGVs and ensuring optimal Tunnel operation for the major objectives. Increasing the size and the number of secure waiting areas for HGVs should definitely be considered.

However, one of the main aspects arising from this timeline is that, at the start of the incident, Eurotunnel tended to underestimate its severity, and to be excessively optimistic about the time required to repair the damage and to restore Interval 4 to operation.

Eurotunnel was also particularly silent about the incident on Sunday morning with regards to communications.

Then, more cautiously, Eurotunnel made no further predictions about the Tunnel's return to full operations, which is confusing for customers.

III Technical handling of January's incidents

19. First of all, let us stress that it is not our responsibility to assess the way the incidents were handled in terms of safety aspects. This work has been assigned to the national rail

accident investigation bodies (BEA-TT in France and RAIB in the UK). We should however like to make a couple of comments.

20. First of all, in terms of the procedure for notifying the emergency services, Kent Fire & Rescue Service have implied that the new procedure allowing Eurotunnel to notify the emergency services that a train has stopped from the RCC, rather than using an incident notification procedure, is not sufficient. This new procedure was introduced to enable Eurotunnel to handle communication during minor incidents but, according to KFRS, it wastes valuable time for the emergency services in deploying the necessary crews to deal with the incident.

21. On the French side, like KFRS, the SDIS, and the SDIS62 area commanding officer in particular, were notified very swiftly of the incident, the fact that smoke had been released and the CO level measured: 300 ppm. Given this initial measurement of 300 ppm, the SDIS62 area commanding officer decided to send the first two response team levels to the Tunnel in case of a genuine fire.

22. KFRS used the word "fire" from the outset.

23. An officer from the UK SLOR, reported that the UK SLOR initially went to the middle of the Tunnel to await the potential BINAT GO. This SLOR had allegedly received the order to proceed immediately to the scene of the incident from the Eurotunnel FDC, because the firefighters there had requested assistance, but the leader of this UK SLOR later learnt that the BINAT GO had not been issued and he was asked to send the UK SLOR back to the UK border. Shortly after this, the UK FLOR allegedly heard banging on the door to CP 4370, which led to the Sub-Prefect of Calais taking the decision to activate the BINAT GO.

Recommendation 1 concerning the procedure for BINAT activation:

Note that this BINAT is officially supposed to be issued following an exchange of faxes. A more modern procedure might be more appropriate, although, from an operational point of view, this doesn't really pose any obstacles to the proceedings.

24. Eurotunnel, probably thinking that, whilst there was certainly smoke present, this did not necessarily mean a fire since the temperature seemed quite low, sent the STTS to retrieve the HGV drivers evacuated into the service tunnel to take them to the Calais Terminal. This seemed justifiable, but neither the STTS nor their drivers were available during this time to transport the French firefighters to the scene of the incident. This led to the loss of approximately one hour before the firefighters could actively start putting out the fire.

25. It should be noted that temperatures had risen to a very high level and that it took several hours to cool the shuttle down, as reported by the SLOR.

26. Operations to remove the shuttle from the Tunnel, and then the subsequent repairs, except the delay due to the involvement of the legal expert. Eurotunnel still seems to have underestimated the severity of this fire's consequences.

27. As the Eurotunnel Chief Operating Officer admitted in a conversation with the Eurostar Operations Delivery Director, the incident on Wednesday morning, involving a further circuit breaker trip due to the insulators, shows that the repair work carried out was inadequate and that all the insulators in the area in question should have been replaced.

28. The incident on Thursday evening, yet another circuit breaker trip, was due to the catenary not being repaired properly, probably due to human error.

29. This all goes to show that this fire, although not a very serious fire in its own right, was significant, leading to relatively large-scale damage which has to be repaired, and such repairs take time. Could the fire have been extinguished more quickly?

Recommendation 2 concerning the possibility of a “light” BINAT:
We suggest that the IGC should consider the possibility of introducing a “light” version of a BINAT in which the SLOR of the country in which the incident has not taken place is able to cross the border to assist its colleagues. This would come under Eurotunnel’s operational responsibility.

30. Even if the Tunnel is operating normally, it is not unusual for there to be queues of lorries waiting at the French entrance to the Tunnel. As soon as there is an incident, the waiting lorries cover a considerable distance. They then are invaded by migrants hoping to enter the UK. The lorry drivers then ask for their lorries to be checked, which in turn delays the resumption of HGV shuttle services in the Tunnel even more. Further operations are slowed and lorry queues lengthen outside of protected parking areas. Therefore, trucks are further invaded by migrants and it is a vicious circle. This also represents a major disruption to the quality of life and particularly the movements of local residents. We have since learned that an extension to the secure Eurotunnel parking facilities is under construction, which should lead to significant improvements in this situation. But will this extension be sufficient given the steady increase in traffic? This extension will certainly not be enough in case of serious disturbance in the Channel Tunnel. Eurotunnel would need to clearly indicate the severity and approximate duration of the disturbance so that lorry drivers are notified well in advance of approaching the Eurotunnel terminal. The problem is also the same in case of ferry service disruptions. This information could open a dialogue between Government, Eurotunnel and hauliers to avoid lorries getting too close to the area in Calais, stopped, and placed at risk of being boarded by migrants.

Recommendation 3 concerning the stacking of heavy goods vehicles in France in case of disruptions in the tunnel:
We propose regular consultation sessions between the French authorities and Eurotunnel to review the situation around the outskirts of the Tunnel and prospects for increased car and HGV traffic. These should also work out solutions for dealing with existing or potential problems in the interests of all. We also propose that Eurotunnel gives clear and reliable information about the severity of the disturbances in the tunnel and the projected period of disturbance with reasonable pessimism. This would enable a dialogue between the authorities, Eurotunnel and haulage companies to decide if it would be preferable to stop lorries well before the Calais area for the duration of the disturbances.

Operation Stack

31. Operation Stack is the process in the UK to manage HGV traffic when there is disruption at either the Port of Dover or the Channel Tunnel. The process is managed between Kent Police and Highways England, who manage the UK’s strategic road network, directing their own Traffic Officers and working closely with the police. Kent Police manage their operations

through the joint control centre with Kent Fire & Rescue Service in Maidstone. Highways England manage their operations through the South East Regional Control Centre in Godstone, Surrey. Highways England's National Traffic Operations Centre coordinates information from the seven Regional Control Centres, and runs the Highways England website, twitter feed and national motorway information signing. We met Kent Police and Highways England, and they submitted written evidence to us.

32. There are three phases of Operations Stack:

Phase 1. HGV traffic is queued on the M20 Southbound between J11 and J12, the Eurotunnel terminal entrance – capacity 422 HGVs.

Phase 2. HGV traffic is queued on the M20 Southbound between J8 and J9, between Maidstone and Ashford, with two queues – the hard shoulder for Eurotunnel bound HGVs, and lane 3 for Port of Dover bound HGVs – capacity 2,340 HGVs. Lanes 1 and 2 remain open for passing motorway traffic. KP issue tickets to each queue, for either Eurotunnel or Port of Dover, without which they will be unable to travel – the ticket system effectively discourages drivers from trying to get around the queues, but it does commit them to either the Port of Dover or the Channel Tunnel.

Phase 3. HGV traffic is queued on the M20 Southbound between J8 and J9, using all four lanes, with two lanes for each of Eurotunnel or Port of Dover – capacity 4,680 HGVs. KP issue tickets as for phase 2. The M20 is shut for all other traffic, which is diverted to the adjacent A20.



33. Over the last 18 months Operation Stack has been activated three times:

14th November, 2014 phase 2 was implemented due to industrial action at Calais affecting the ferry service.

17th April, 2014, phase 1 was partially implemented due to an incident in the Channel Tunnel.

21st – 24th January, 2015, phase 2 was implemented due to several incidents in the Channel Tunnel. Preparations were made to implement phase 3, but this was not required. Phase 3 has never yet been implemented. At the same time Port of Dover capacity was reduced due to maintenance, so was unable to provide additional capacity at short notice.

34. This is less than was the case in previous years – in the years 2005-2010 Operations Stack is estimated to have cost the then Highways Agency £8m, and once was in place for seven days continuously.

35. Highways England and Kent Police are very reluctant to implement Operation Stack for several reasons. It is expensive, costing Highways England alone c. £1m per day. It is unpopular with local people, who find the motorway and local roads gridlocked, and with local emergency services, who face longer response times. There are safety issues, with potentially up to 4,680 HGV drivers camped out on a motorway, cooking with gas stoves and with no washing and toilet facilities, and a major clean up is necessary after each implementation. Other safety issues include an increased risk of road accidents, and the safety of Kent Police officers walking along lengthy stretches of motorway handing out tickets and marshalling HGVs, often with drivers needing to be woken up to move on.

36. The nature of HGV movements in the UK has changed in recent years. Contracts are now generally based on a 48 hour turn-round trip from Europe, so drivers are required to get back across the channel as soon as they can, rather than wait out disruption outside of the M20 corridor, which was the past practice. In addition HGV traffic has grown by 30% in the last two years. Highways England and Kent Police now have to act much quicker than in the past to implement Operation Stack, as without it the Folkestone / Dover area quickly fills up with HGVs trying to cross the channel by any means, and they park in residential and commercial areas, on kerbs and roundabouts, which is very unpopular locally. So local people there want Operation Stack implemented quickly, whereas others between Ashford and Maidstone do not want it quickly. Local haulage companies in the Dover / Folkestone area, wishing to cross the Channel, are obliged to go north up the M20 to join the queues at J8, which is also unpopular. Kent County Council have c. 1,000 spaces for HGVs to park in the county, but these are spread around the county. Truck services are available at M20 J11 (“Stop 24”) and J10 (“Ashford International Truckstop”), which can accommodate between them c. 400 HGVs. However after a short free period these are chargeable facilities, typically £20, and we have observed that HGV drivers usually have no authority to incur additional costs in this way, and these facilities do not play as full a part in Operation Stack as they might ideally be able to. Ideally an off motorway location could be identified to park up to 3,000 HGVs, free of charge, with facilities for drivers. However no organisation can justify the expense of this, especially when it might only be used once a year.

37. Eurotunnel are investing to enlarge the HGV queuing space between J11A and the Eurotunnel check in, so that an additional 400 HGVs can be accommodated off the motorway network. This should give a longer time gap between an incident and Operation Stack being required, during which time the incident may be resolved, and this initiative is welcome.

38. A review of short-term solutions gave rise to an additional measure that has recently been implemented in Dover, called “Dover Tap”. This is a £1m investment in new traffic lights on the A20 that are able to stop HGV traffic in a queue on the A20, to prevent them flowing into Dover and causing severe congestion there. These are activated between Kent Police and Highways England when there is queuing at the Port of Dover, and the Port of Dover police are involved in this too. All parties, including stakeholders in Dover, are pleased with this improvement, which allows Dover to circulate with a queue of HGVs outside the town on the A20. The project suggests a strong working relationship between Highways England, Kent Police, Port of Dover and the Port of Dover Police. We saw evidence that Port of Dover provides Highways England and Kent Police with detailed commercially sensitive traffic

forecasts by ferry operators, even though the operators are competing, and we noted that Eurotunnel provide no traffic forecast information to Highways England, but do provide a limited forecast to Kent Police officers at Folkestone.

39. We reviewed the flow of information between Eurotunnel and Highways England during the January incident. The information flow was poor, only on request and only by phone. A request from Highways England to use the motorway signing to say “Eurotunnel Closed”, which Kent Police wanted, was turned down by Eurotunnel who said the service was only “suspended”. Highways England will not show “Eurotunnel Closed” on motorway signing without Eurotunnel’s permission, so they showed simply “Long Delays at J11A”. During the January incident Highways England admitted they had been obliged to make decisions in respect of the UK motorway network informed only by the Eurotunnel website.

40. We have observed elsewhere in this report that Eurotunnel's website was over optimistic. As observed elsewhere in this review, no common language concerning an incident (e.g. “serious incident”, “level 4 incident” etc.) exists between Eurotunnel, Kent Police and Highways England, so everyone is trying to guess what an “incident” in the Channel Tunnel really is, so they can judge for themselves how to act in respect of their responsibilities.

41. It should be noted that the Highways England Regional Control Centre has access to the Kent Police live incident log, so they can see everything that the Police are being told, and are a participant in any roads related Strategic Co-ordination Group conference.

42. Eurotunnel have described their frustration that once freight shuttles were running again, some left Folkestone empty while HGVs continued to queue to access the Port of Dover, and in their view Kent Police failed to divert HGVs to the freight shuttles where capacity existed to clear the queue quicker. Kent Police and Highways England share the view that the separation of HGVs into two managed queues in Operation Stack, with each ticketed separately, is hard to do at short notice, requiring 14 Kent Police vehicles, with two officers in each one. It is not practicable to issue new tickets and redirect HGVs to different destinations at short notice, especially when most of the drivers have limited English. We observe that a better flow of information throughout the incidents might have enabled better decision making by all those involved, enabling the queues to be cleared quicker.

43. It was clear to us that Highways England does have good working relationships with many other stakeholders, such as the Port of Southampton where a similar Operation Stack plan exists for the M271, but has never been implemented as regular discussions are claimed to be very effective. Similar constructive relationships exist with Gatwick Airport. However it was clear to us that relationships between Eurotunnel, Kent Police and Highways England could be more effective.

44. The outcome of these dysfunctional relationships between Eurotunnel, Highways England and Kent Police is poor and inconsistent information to Eurotunnel’s customers and other parties, which make everyone look as though they have no control of the situation. It is quite possible at present for Eurotunnel’s website to say the delay at Folkestone for HGVs is 15 minutes, while further up the M20 HGVs are being directed into Operation Stack for a seven hour wait. It is to nobody’s advantage that each party claims that delays of their network are for each network to manage in isolation.

Recommendation 4 concerning Operation Stack in the UK: Eurotunnel, Highways England and Kent Police should be encouraged by the IGC to develop an improved relationship, based around better communications, enabling everyone to make better decisions. They should review their real time communications between their Control Centres and consider implementing a process of email advice and regular updates. This should not replace the limited direct phone contact between their Control Centres, which is necessary for parties to engage and jointly develop a plan of action. However in a busy Control Centre environment, emails can play a significant role in consistency and clarity, as well as easily providing regular updates, even when the update is simply to say that a situation is unchanged.

The development and sharing of effective contingency plans by Eurotunnel, for operations, customer handling, customer, stakeholder and media communications should form the basis of what all parties should expect when an incident occurs. The contingency plans should include a common set of terms covering a wide range of anticipated incidents impacting on the Channel Tunnel. This in turn should enable more effective decision making by all parties, and a more consistent approach to communicating with customers, stakeholders and other third parties.

It is our view that better communications between all parties, resulting in each party making better informed decisions in respect to their area of responsibility, will result in more effective use of the available facilities during an incident, and a better flow of information to customers and other stakeholders.

IV Technical problems encountered by Eurotunnel

45. It is particularly interesting to note that the main incidents which occurred in the Channel Tunnel between October 2013 and March 2015 were due to catenary circuit breaker trips, especially when HGV shuttles are using the Tunnel.

46. According to Eurotunnel, there were 45 circuit breaker trips during the above period, 5 of which are linked to infrastructure failings and 23 to HGV loads.

4.1 Infrastructure failings

47. Infrastructure failings include two fundamental causes:

4.1.1. **Defects in porcelain insulators** which have also been replaced by synthetic insulators in the entrance intervals (5 and 2) and in wet areas to avoid inconvenient tripping during periods of heavy rain or snow.

4.1.2. The Failure of Catenary Flying tails (*élingue*)

48. Over the last 18 months a number of catenary failures have occurred, resulting in the contact wire being broken and destroyed during the passage of a train. In each case it was difficult to identify the cause of the failure due to the evidence being destroyed during the incident. After the significant incident of 7th July, 2014, SNCF investigators were appointed to review the evidence, and concluded that a missing pin had broken and caused the incident,

although this could not be definitively proved. On 18th January 2015, Eurotunnel noted that the catenary had fallen, but had not yet been in contact with a train: the evidence was for the first time intact. The evidence identified a component known as a “flying tail” which sits on the end of the registration arm between the steady arm eye and eye clamp (see illustration in appendix). The flying tails are usually under tension, and when one fails the balance of the catenary is lost. In one direction the balance weights drop, and in the other direction the contact wire sags. The consequence of this sag is that when a train passes, the wire comes into contact with the roof or the train and gets tangled up in the pantograph, causing a significant dewirement, typically with several hundred metres of damaged catenary. On reviewing the previous incidents it was possible to note that these were probably caused by a flying tail failure. All the incidents have also occurred in a 6km section under the Dover cliffs, known as the “wet area”. As a result of in-depth investigations of the 18 January incident it is possible to identify the cause of the failings of the flying tails. Manufactured from stainless steel, these had shown corrosion, resulting in its failure. The catenary maintenance regime, originally designed by SNCF, had not foreseen the replacement of the flying tails at any time in the course of their life cycle. Similarly, no similar corrosion had been the base cause of the failure of flying tails on the SNCF network. There are c. 200 flying tails in the Channel Tunnel. The accelerated corrosion appears to be as a result of the particular atmospheric conditions in the Channel Tunnel, with consistently high temperatures and humidity, and the presence of salt water. These conditions were not well understood during the design and construction of the Channel Tunnel or the creation of the infrastructure maintenance regime, which relied on experience with conventional above ground railways or tunnels with more common characteristics.

49. Eurotunnel decided to replace the flying tails in the wet area immediately, and to undertake the work themselves as quickly as possible. They also decided to select a contractor to replace all the flying tails in the tunnel in the medium term.

50. On 21st April, 2015, another flying tail failed, causing a catenary failure and significant disruption. Contrary to observations, this time it was not in the wet area. Eurotunnel therefore noted that the problem was getting worse. They immediately proceeded with a temporary containment measure of applying a metal wire around every flying tail (see appendix), so that in the event of such a failure the complete tension of the contact wire would not be lost. This measure will not stop the catenary wire sagging completely, but Eurotunnel believe it will stop the contact wire sagging by so much that it gets snagged by the pantograph leading to its destruction. As at 5th May, all the flying tails in the South Tunnel had been fitted with this containment, and 65% of the North Tunnel was complete. Eurotunnel also decided to accelerate the contract to replace all the flying tails, and are engaged with the selected contractor to agree a method and programme to achieve this as quickly as possible, which is the medium term engineering solution to the problem. In parallel, Eurotunnel are reviewing their inspection arrangements to establish a protocol which would allow them to quickly identify a failed flying tail that is being supported by the wire containment measure.

51. The approach of quickly finding a containment to sustain on-going operations, followed by an engineering solution, is in line with established best practice in railways.

Improving Catenary Performance

52. The flying tail is one example of a key component that has failed long before the maintenance regime mandated its replacement necessary, and there have been others. It is inevitable in the unique environment of the Channel Tunnel, with unusual levels of warmth, humidity, salt water, frequent trains and heavy tonnages, that components will not perform at

the same level as on other traditional main line railways. As the Channel Tunnel is now over twenty years old, some components expected to last indefinitely are failing, it is time to comprehensively review the original maintenance regime defined by SNCF in the light of Eurotunnel's now considerable experience.

53. To aid this review Eurotunnel have commissioned an extensive audit of the catenary system, which will commence imminently and continue to early 2016. This involves a "hands on, at height" examination of many parts of the system, and removal of components for laboratory examination. During the course of this examination defects found will be rectified. Some components will be removed and examined in detail. The findings of the audit will probably result in a program of further work, and will inform a review of the maintenance regime that will better take account of experience and current asset condition. This approach is in line with best practice in the UK, where a program of catenary audit in this way considerably enhanced the performance of key routes during the 2012 London Olympics.

54. In these conditions, it is equally possible that the life expectancy of some components may be longer than expected, because there is no freezing in the tunnel.

Asset Condition Monitoring and Intervention in the Future

55. For the future, as the infrastructure ages and slowly deteriorates in a particular environment, Eurotunnel needs to have a better knowledge of the condition of the infrastructure, so that they can consistently intervene before a critical performance affecting failure occurs. Since the Channel Tunnel was built there have been significant technological advances with condition monitoring systems. We reviewed Eurotunnel's plans in this respect. These focus around equipping a Eurotunnel infrastructure works train with a range of conditioning monitoring technology between now and 2018. This technology is intended to monitor track geometry, rail condition, switch condition, signalling, and catenary contact wire position. This is consistent with best practice being developed in Europe and Japan, and it is our view that Eurotunnel's place in the implementation of this technology should enable them to procure proven and available technology, and to benchmark their data with other infrastructure managers and with railway undertakings in the future. We were informed that this works train would run regularly through both tunnels at 50-90 km/h to collect the data, giving Eurotunnel the ability to quickly detect any change in key asset condition.

56. Away from this works train, Eurotunnel are investigating other remote condition monitoring equipment, for example to identify exactly the location of a catenary trip, so the cause can be more quickly established. Most of this equipment is available on the market, and the technology is steadily advancing. At the same time software packages to review the significant amount of data produced, and identify trends, changes and immediate actions to be taken are also advancing.

57. Whilst it is unfortunate that the approach has not been completed as a result of recent poor asset performance, we consider it is the right approach and should be encouraged and supported.

Recommendation 5 regarding the maintenance and renewal procedures of railway equipment in the tunnel:

To these aspects, we can add premature rail failures due to corrosion, Due to the specific atmosphere in the Tunnel, with temperatures of 25°C Celsius, very high levels of humidity, especially in certain areas, called wet zones, and metallic dust in suspension, the corrosion of certain components is considerably more than you might

expect to railway equipment in the open air. As a result, maintenance standards and the frequency of detailed inspections of the facilities need to be adapted accordingly.

4.2 Circuit breaker trips due to HGV loads

58. **The pagoda “saga”** In the model selected back in 1986, HGV shuttles were to be completely enclosed, like the passenger shuttles, so that they too could be equipped with an on-board fire extinguishing system. As soon as the design phase started, it proved impossible to comply with the 22 t / axle constraint other than by having 3 two-axle bogies, or two three-axle bogies, which would have made a huge difference in cost Eurotunnel, having convinced the IGC to accept the idea of “semi open” shuttles, then put the BREDA freight shuttles into service.

59. In 1997, Eurotunnel wanted to expand the shuttle fleet and for reasons of economy opted to buy “decked” wagons, which are ARBEL shuttles (slightly adapted transporter wagons), adding pagodas (4 pagodas per wagon) to approximate to the concept of “semi-open” shuttles.

60. It appears that the possibility of removing the pagodas from service was broached, but the responsible parties at Eurotunnel and the IGC were convinced that these pagodas served a useful purpose in containing tarpaulins, protecting the catenary and protecting the lorry drivers and Eurotunnel staff from the 25,000 Volts carried by the catenary

61. When the ARBEL shuttles came into use in 1999-2000, the pagodas displayed structural weaknesses that took the form of cracks appearing on the uprights and roof components. This also led to a dispute with the manufacturer, who was acknowledged by experts to be at fault. Welding repair operations have been performed since this period. Over time, the frequency and scale of these operations have increased on a regular basis.

62. With effect from 2006-2007, given the lack of spare structures, a gradual programme to dismantle the pagodas was initiated. In the first phase, only the central pagodas were dismantled, with a series of gradual test phases leading to the dismantling of the central pagodas from all wagons in 2007, with the IGC's approval. In 2011 and 2012, as the remaining pagodas continued to deteriorate, it was decided as a result of the risk posed by the pagodas, to dismantle the pagodas at the rear of the wagons.

63. At the end of 2012, in the absence of an alternative solution, Eurotunnel decided to implement the catenary earthing system in the vicinity of the platforms. In other words, lorry drivers find themselves in the protection zone extending 3 m around the catenary during loading or unloading operations. They are thus protected from electrical hazards. This new procedure allowed for the dismantling of the remaining pagodas at the front of the wagons.

64. Eurotunnel reported that the process received review and non-objection from the IGC on 27 July 2012.

65. Having dismantled the final pagodas, problems came to light with lorry tarpaulins. If they were not properly fixed in place, they were able to work loose and cause the catenary to trip, as seen in consequent incidents. In early 2013, a dedicated unit for checking that tarpaulins

were correctly attached was introduced at both terminals. This made it possible to operate the freight shuttles under acceptable service quality and safety conditions once again. However, this additional activity had an unfavourable effect on HGV traffic flow through the terminals. Note that height checks of lorries at the tollbooths and aerial detectors at the bottom of each ramp were put in place when operations first commenced.

66. At the same time, a new research programme was initiated in an attempt to define the characteristics of a new pagoda to withstand operating conditions in the Tunnel. Prototypes have been tested on a test bench, and then under dynamic conditions. The new pagoda model was then installed on the rear rakes of the ARBEL shuttles. Eurotunnel said that the intention was to install an optimised and mechanically strong structure on the front rakes, with a positive aerodynamic impact on the lorry tarpaulins and a satisfactory energy performance.

67. Note that neither the Safety Authority nor the IGC have currently been consulted about this new type of pagoda.

68. Following the fire on 17 January, Eurotunnel decided not to wait for the results of the test programme on these future deflectors and to order the same pagodas as are currently in service on the rear rakes, which have operated satisfactorily for the past five months, for installation on the front rakes.

69. Eurotunnel hopes to install the future deflectors, when the design has been finalised, on prospective new shuttles ordered recently.

70. This whole pagoda “saga”, whilst clearly demonstrating Eurotunnel's determination to resolve issues, is still rather perplexing. The problem seems to have been tackled in the aftermath of specific incidents to deal with a specific issue, rather than taking a genuinely systematic approach.

- **The issue of catenary trips**

71. Circuit breaker trips are certainly a regular occurrence on rail networks. In the Ile de France region, large sub-stations trip several times a week, although other 25,000 Volt sub-stations, including LGV lines, trip much less frequently. 1,500 V DC sub-stations supplying busy line sections trip once a day on average. However, 90% of these trips are due to fleeting defects or overloads and cause absolutely no disruption to operation since they are reset automatically within seconds of tripping.

72. These kinds of trips also occur in the Channel Tunnel and cause absolutely no disruption to operation since they are reset immediately. They are probably tripped as a result of overloading or a spurious defect.

73. However, there are a number of trip scenarios which have more extensive consequences and these are due to freight shuttle loads.

74. The Autoroute Ferroviaire Alpine (Alpine Rail Motorway service) operates between Aiton, near Montmélian in France, and Orbassano, near Turin in Italy. The wagons on this service do not have any pagodas and they do not experience catenary trips. It must be noted, however, that the catenary voltage is 3,000 V DC (as opposed to 25,000 V AC in the Channel Tunnel).

75. The Perpignan Bettembourg rail motorway in France uses catenaries with a voltage of 25,000 V AC in its Northern section, and 1,500 V DC on the southern part of the route. There are only 4 return journeys each day, which isn't very many compared to the traffic in the Channel Tunnel, but there is no tripping when these trains pass through.

76. The main rail motorways in Switzerland do not seem to experience these kinds of problems either. The catenary carries a current of 15,000 V AC. The atmospheric conditions in these tunnels may lead to high temperatures, but they undoubtedly experience less humidity.

77. There was a fire in the Simplon Tunnel on 9 June 2011 caused by a heavy goods vehicle. However, this seemed to be due to the door of a semi-trailer being accidentally left open, which caused the tarpaulin framework to blow upwards and leading to a series of short-circuits involving the catenary, subsequently leading to a fire.

78. It should not be forgotten that a characteristic of Eurotunnel's HGV shuttles is their speed: 140km / h, which is significantly higher than other similar trains.

79. On most rail motorways, especially those passing through the Alps, note that there is a considerable distance between the area where the HGVs are loaded onto the wagons and the entrance to the tunnels. On the one hand, this distance means that incorrectly loaded HGVs or their aerials may cause circuit breakers to trip, but in the open air. On the other hand, it means that flames or smoke can be detected on specific HGVs. In Eurotunnel's case, there is not enough of a distance to do this.

80. Eurotunnel is considering installing a height detector before the Tunnel entrance, which could be in the form of a 25,000 V electric cable, but with a low intensity, to detect excessively high loads and aerials. Eurotunnel is also considering a camera system to detect flames, smoke or excessively high temperatures on board the HGVs.

81. In addition to the unique features relating to the Tunnel atmosphere, which we have already described, we must not forget that the Tunnel has piston relief ducts around every 250 meters which have considerable beneficial effects with regard to energy and safety, but which can cause turbulence as shuttles pass by, exercising stress on the shuttle structures and particularly on the pagodas, which may partly explain the appearance of the cracks observed in their structures.

82. To conclude, note that there are three problems which we need to resolve simultaneously:

- a. Prevent tarpaulins or parts of the HGV structures tearing off and coming into contact with the catenary.
- b. Prevent HGV aerials coming into contact with the catenary.
- c. Prevent any potential sparking setting light to any part of the HGVs.

83. Obviously, we don't currently have a solution to these problems. Will the deflectors be effective? Will the pagoda supports be able to withstand the forces they experience in the Tunnel? Will the new pagodas, one on each wagon, be sufficient to avoid the three problems described above? If they prove to be satisfactory, is it not better to instal four per wagon? Is it feasible to construct lightweight pagodas from a composite material leading to less stress on their uprights? Would this kind of pagoda be able to withstand the turbulence experienced on passing the piston relief ducts? We should also note that the tender specification for a third generation of HGV shuttles allows for 4 pagodas to be fixed to each wagon as a

preventive measure. Is detecting height by means of an electric cable ever going to be truly effective?

84. We should not forget the events of 18 and 19 December 2009 when five Eurostar trains broke down simultaneously in the Tunnel. Breakdowns of this kind had occurred in previous winters (but not on such a huge scale) and solutions had been provided by technicians from the networks that owned the Eurostar locomotives. However, these were off-the-cuff responses to deal with each breakdown as it happened without systematically examining the effects of the very specific atmosphere in the Tunnel on the various components making up the powerful Eurostar locomotives when operating in extremely cold and snowy weather and then being suddenly subjected to the heat and humidity of the Channel Tunnel.

Recommendation 6 concerning pagodas:

We therefore propose that the various ongoing research programmes should all be continued, while forming part of an overall systematic study programme with a view to simultaneously assessing the various problems to be resolved in the light of the experience of other infrastructure managers and of rail operators and the very specific conditions that apply in the Channel Tunnel, including the speed of the freight shuttles. The IGC should play a full part in this study programme.

Eurotunnel should not be able to install equipment (pagoda, deflectors...) on the shuttles without having obtained authorization from the CTSA and the IGC.

V Monitoring service quality

5.1 Oversight of Eurotunnel technical performance in the future

85. The Intergovernmental Commission for the Channel Tunnel (“IGC”) is mainly occupied with safety matters (through the Channel Tunnel Safety Authority) and economic regulation. In the past the IGC has primarily concerned itself with train performance where it is connected with safety. This has been satisfactory when the system was new and generally reliable, but as the system has aged, as described earlier in this report, unexpected trends, incidents and concerns have emerged that have been brought to the attention of IGC. The IGC was established by the Treaty of Canterbury to supervise all matters concerning the operation of the Channel Tunnel, including Eurotunnel’s responsibility to “*ensure the continued flow of traffic in the Fixed Link under satisfactory safety conditions*”.

86. It can be argued that every train performance issue in the Channel Tunnel has safety implications. However generally in the railway industry train performance management is handled by separate teams with different skills and experience. Safety will always take precedence over train performance, which is right, and there is a relationship – a safe railway is generally considered to be a high performing railway, and a high performing railway is generally considered to be a safer railway. However in practical terms, such as meeting agenda time, resource allocation and choices of skills to deploy, safety management will take precedence.

87. Eurostar, as the predominant user of the Channel Tunnel after Eurotunnel, takes a keen and well informed interest in Eurotunnel’s train performance. We have observed though that this relationship, although much improved, is not yet mature and fully effective. A new

performance regime has recently been introduced, in which Eurostar pays Eurotunnel an incentive when agreed performance targets are met. It is hoped that this regime will mark the beginning of a closer relationship on performance by both Eurotunnel and Eurostar. As the two companies most involved, and with the shared commercial and reputational incentive of good performance, it is logical for a constructive, expert and professional relationship to develop between them, with appropriate challenge on performance issues by both sides in a regular forum. If this relationship functions well, other users of the Tunnel, such as the railway companies and freight train operators, should benefit through improved performance for all.

88. Eurotunnel has its own commercial incentive to deliver a high standard of performance by its car and lorry shuttles, which operate in a competitive market.

89. The performance of Eurotunnel, Eurostar, DB Schenker and GBRF services using the Channel Tunnel seems to be very good by the standards of French, Belgian and UK rail networks although this is difficult to evidence from the limited performance information published by Eurotunnel. Eurotunnel and Eurostar could highlight good performance and “good service” more clearly on the home page of their websites, in line with best practice by other rail operators.

STATUS UPDATES

Line	Status
District	Minor delays +
London Overground	Severe delays +
Bakerloo	Good service
Central	Good service
Circle	Good service
Hammersmith & City	Good service
Jubilee	Good service
Metropolitan	Good service
Northern	Good service
Piccadilly	Good service
Victoria	Good service

Figure 1. How most Londoners read about the performance of their local trains in tunnels.

90. However when an incident does occur, and particularly when the catenary is involved, one finds performance for the following days is immediately poor. These incidents attract attention from customers and stakeholders, and dominate all commentary on the performance of Eurotunnel and Eurostar.

Recommendation 7 concerning Eurotunnel performance:
Eurotunnel and Eurostar should be encouraged by the IGC to further develop their regular performance management discussions, including the sharing of data, trends, analysis and action plans by both parties, to their mutual benefit. Both parties should identify other similar railway undertakings with which to benchmark the performance of trains, rolling stock and infrastructure. Key performance indicators should be agreed and reviewed regularly.

The IGC should consider holding an annual meeting with Eurotunnel dedicated to annually reviewing the previous year's train performance, and projections for the year to come. This should review key performance indicators, emerging trends of performance of all trains and shuttles through the Channel Tunnel, the factors effecting performance and management's improvement plans. Eurostar, DB Schenker and GBRF should be invited to make representations. In this way the IGC can assure itself of the continued flow of traffic on an annual basis, and that the relationships between Eurotunnel and its customers are functioning and driving a culture of continuous improvement within all the organisations involved.

5.2 Real-time management of traffic flow performance by Eurotunnel

91. Eurotunnel's activities are managed in real time by the Rail Control Centre ("RCC"), located normally in Coquelles, with a duplicate back up facility in Folkestone. The RCC manages the signalling of trains on the concession, the communications with trains, terminals and customers such as Eurostar, the supply of electricity for traction, and the system security. Above each RCC is a crisis management centre, which accommodates a multi agency team able to manage any incident in the Channel Tunnel. If the incident is in the UK section of the Tunnel, the Folkestone crisis management centre leads the incident. If it is in the French section it is led from Coquelles. Video links and phone lines connect the centres.

92. Eurostar have their Control Centre ("CRE") in Lille, which runs the entire Eurostar operation in real time. The centre manages Eurostar trains, employees, the train fleet, on board customer issues and contact with the networks used by Eurostar in the UK, France and Belgium.

93. Eurotunnel's freight train customers are DB Schenker, who have a similar Control Centre in Doncaster, and GBRF / Europorte, who's Control Centre is in Peterborough.

94. We visited Eurotunnel's RCC and Eurostar's CRE, and reviewed their method of operation. We also met senior managers from DB Schenker and GBRF to understand their real time crisis management processes in respect of the Channel Tunnel and how well they worked.

95. Our observations and recommendations on these activities, specifically in relation to the Channel Tunnel, are as follows:

a) Indications of the real time movement of trains in the Channel Tunnel can only be observed in Eurotunnel's RCC. An image of this system is available in the Eurostar CRE, but

it is limited, is screened with an eight-minute delay and does not show whether a train is moving or stationary. On all other networks Eurostar CRE and the freight operators can observe the real time passage of trains, and their relationship with other trains on the network. Experienced controllers can judge for themselves the running of individual trains and whether action is needed by them to minimize delay and subsequent implications for customers and resources. Discussions are underway between Eurotunnel and Eurostar to improve the provision of this information.

Recommendation 8 regarding the real time management of traffic flow: Eurotunnel should make available a security protected web based visualization of train location within the concession to Eurostar and the freight operators. They could also make the data behind it available so that can be used in their other applications, as soon as possible. Eurotunnel assured us that all this will be done by September 2015; with regard to Eurostar, integration would be put in place in December 2015. The IGC should ensure that this information is supplied appropriately.

b) Communication between Eurotunnel's RCC, Eurostar's CRE and the freight operators is entirely by phone call. All other networks provide Eurostar and the freight operators with regular email incident updates, supported by a phone call discussion when necessary. Most members of the control teams regularly and simultaneously refer to the email updates, for different purposes such as the implications for customers, train and crew deployment. The emails are often partly pre-prepared in template form, so they are quick to write and send. The better the quality of the live information that is available, the better the real time decisions will be.

Recommendation 9 concerning communications between Eurotunnel and railway companies: Eurotunnel, Eurostar and the freight operators should review their real time communications between Control Centres and consider implementing a process of email advice and regular updates which is consistent with the best practice of the other networks used by Eurostar. This should not replace direct phone contact between the Control Centres, which is necessary for parties to engage and jointly develop a plan of action. However in a busy Control Centre environment, emails can play a significant role in consistency and clarity, as well as easily providing regular updates, even when the update is simply to say that a situation is unchanged.

c) There is regular dialogue between the RCC and the Control Centres of Eurostar, DBS and GBRF, and this is effective with good relationships in place. Exchange visits have been held to better understand each other's activities and needs.

Recommendation 10 concerning communications between control centre teams: The relationships between the Control Centre teams, and understanding of each other's needs, should continue to be strengthened at every opportunity. The new proximity of most of the teams in Lille and Calais should make this easier.

VI Communication and information in the event of an incident:

96. This section considers the communications process between Eurotunnel and customers, stakeholders, regulatory bodies and the media. Operational communications are covered separately in the section titled “The Real Time Management of Performance by Eurotunnel”.
97. We met key people in Eurotunnel and their customers, such as Eurostar, rail freight companies and road hauliers, and examined examples of recent communications during incidents, in particular during the review of the January, 2015 incidents.
98. Our observations and recommendations on these activities, specifically in relation to the Channel Tunnel, are as follows:
99. Eurotunnel and Eurostar make widespread use of few reasons for disruption in the Channel Tunnel, and by far the most common is “un incident technique” / operational difficulties. This has been the standard phrase used since the Channel Tunnel opened, and appears in announcements, on websites and information screens. On other transport undertakings in France and the UK in recent years travellers have become used to a greater level of information from transport operators, who now routinely provide a more detailed reason for any disruption, and update this when necessary. The use of “operational difficulties” is no longer adequate, especially to UK residents now used to more information. We observed how terminal staff at London St Pancras obtained this phrase for use during an incident from the Eurostar website. We also observed how such a vague message encouraged others to probably develop their own version of events, based more on non-verified information than on fact. The result can be as many as five different versions of the cause of an incident as was the case in the incidents of 17 January.

Recommendation 11 concerning the content of Eurotunnel communications in the case of an incident:

Eurotunnel and Eurostar should review the messages used by all sources during an incident, and determine a range of frank and understandable statements in line with best practice amongst infrastructure managers and rail freight operators in the UK and France.

100. We also found that there there was not a good connection between the Eurotunnel RCC and the team in charge of communication. It is absolutely essential that those receiving information are, in the case of an incident, informed in real time of the development of the situation and the prospects for opening or closing the various intervals of the tunnel.

Recommendation 12 concerning the information communicated by Eurotunnel to communicants :

Eurotunnel must ensure that there is a person in the RCC in charge of communicating accurate real time information to communicants about the development of the situation and the prospects of opening or closing various intervals of the tunnel.

6.1 Private car passengers

101. Eurotunnel has recently put in place a team of people based at the Folkestone terminal who communicate with Eurotunnel Shuttle car customers by means of text and twitter. This

method of communication was first used during the incidents in January. By use of a zoned mobile phone reception system in the area of the Tunnel, and inside the Tunnel, they are also able to communicate directly with their customers who are in transit. When booking on line customers are encouraged to provide a mobile phone number to enable communication during disruption. Eurotunnel believe that in severe disruption customers without phones, who have not provided a number or who are carrying a different phone, are kept informed by terminal staff, train crew or neighbouring customers. Eurotunnel were unable to say what proportion of customers received messages during the January disruption, they did however send 21000 text messages during the incidents, some to shuttles passengers, others to lorry drivers and road hauliers. The Folkestone team are kept informed of developments during an incident by the RCC, and this is a two way communication, so that in the event of the team learning something of relevance to the incident by way of a tweet from a customer undergoing the incident, this can be passed back to the RCC. We reviewed the messages sent during the January incident, and found these to be informative and generally effective. Text and twitter use is not the means most appropriate for the passing of very detailed personal information. Where this is necessary the customer is directed to email, for example in the case of a booking alteration. At the terminals additional staff are deployed to redirect customers to ferries if possible, and to issue ferry tickets.

102. Eurotunnel also use their website to provide limited information about the status of their service.

103. Eurostar have a similar customer relations team at Ashford who manage Eurostar's social media, email and website activity. During an incident the Ashford team are strengthened and focus on providing real time customer information, using information provided by Eurostar's CRE in Lille. Eurostar are encouraging customers to provide either an email or mobile phone number when booking tickets, and are aiming for 100% collection of this data by the end of 2015.

Recommendation 13 concerning the communication with passenger shuttle passengers in case of an incident:

Although the use of targeted text and twitter is in its early days, it is generally effective and welcomed by customers, and should be encouraged. Best practice amongst other transport operators in the UK should also be identified and adopted. In particular regular updates to their customers should be provided by both Eurotunnel and Eurostar; even if there are no new developments. Customers should be further encouraged to provide their mobile phone number or email for this purpose, and research undertaken to establish what proportion of Eurotunnel customers receive communication in this way, and what they think of it. Finally Eurotunnel should engage with Eurostar to seek a degree of message consistency during an incident, across websites, text and social media.

6.2 Road haulage companies

104. Eurotunnel Shuttle Freight customers receive communications in a number of different ways to car customers. Eurotunnel aim to communicate by email and by text message with the road hauliers' 4-5 times daily, with current information about the status of the Freight Shuttles. The road hauliers then communicate directly with their lorry drivers, and discuss with them what action to take. At the same time, and if their mobile number is known, Eurotunnel will send them text messages. Most road hauliers have accounts with Eurotunnel

and the ferry companies, and can easily switch between the two at short notice, without any intervention by Eurotunnel being needed. We spoke to several haulage companies' representatives who had mixed views about the standard of the information provided, saying that it was over optimistic, too generalised and not informative enough about the nature of an incident. We were told that about 85% of lorries using the Channel Tunnel were now registered outside the UK, making effective communication in multiple languages across numerous countries more challenging, due to the number of countries from which HGV drivers originate from.

Recommendation 14 concerning the communication with road hauliers in case of an incident:

Eurotunnel should review the message frequency and content sent to road haulage companies during disruption, and make use of the regular updates from the RCC suggested elsewhere in this report to provide informed and regular updates, even when there is no change in the situation.

6.3 Freight rail companies

105. Eurotunnel's RCC communicates by phone during disruption to rail freight companies DB Schenker and GBRF. There are no agreements about how often these calls should be updated.
106. Most international freight services are in operation through Dollands Moor and Fréthun, that is to say, before and after transit through the Channel Tunnel, which allows them to recover slight delays which might occur in the tunnel . Communication becomes important when this recovery time is likely to be exceeded.

Recommendation 15 concerning the communication with rail freight companies: Eurotunnel should review their real time communications with the rail freight operators and consider implementing a process of email advice and regular updates which is consistent with the best practice of the other networks. This should not replace direct phone contact between the Control Centres, which is necessary for parties to engage and jointly develop a plan of action.

6.4 Eurostar and the press

(i) Direct communication with Eurostar

107. In the first instance, we should acknowledge that there have been considerable improvements in the information and communication procedures between Eurotunnel and Eurostar over recent months.
108. Eurotunnel and Eurostar have recently developed a suite of contingency plans for a range of line blockage scenarios in the Channel Tunnel. These were used effectively for the first time during the January, 2015 incidents. This enabled Eurostar to more accurately predict the arrival time of trains at destination, keep customers better informed and re-plan their operation accordingly. We have reviewed these contingency plans.

Recommendation 16 regarding the necessity of contingency plans: The work on embedding contingency plans into the business continuity of Eurotunnel and Eurostar in particular should continue, and should be broadened to include all

departments in each company. Well-prepared, realistic and rehearsed joint contingency plans reduce the amount of decisions needed during an incident. This should accelerate the implementation of an effective plan, improve customer information, give a more consistent response regardless of who is on duty and reduces tension between organisations during an incident. Observers should recognise that contingency plans have their limits, particularly in the initial hours after an incident when the operation has to be switched from normality, through stop and restart, to switch over to a contingency plan. Generally the longer distance the services involved, the more difficult and prolonged this switch over is.

109. The Control Centres are relatively small, with between six and eight people on duty, and less at night. Both Eurotunnel's RCC and Eurostar's CRE are supported by an on call team who quickly strengthen the teams during an incident. There is clearly a loyalty in both companies' teams to attend for duty during an incident, whether on call or not, and support their colleagues. Eurostar have also recently strengthened their Lille area on call in order to better support the CRE during an incident. However it was noted that whilst the Control Centres are effective and undertake their roles professionally, during an incident there is a lot of communication, discussion and decision making taking place outside of the control centres, between the Eurotunnel management team, between them and the management team of Eurostar and other stakeholders. Most of this communication occurs on mobile phones and therefore are not recorded. This evidence of the exchanges between these people for subsequent review is difficult to obtain. Calls between made to and from the RCC and CRE using control centre telephone concentrators are in turn all recorded and reviewed.

Recommendation 17 concerning the communication between management teams in the case of an incident:

The wider adoption of pre-prepared contingency plans across Eurotunnel and Eurostar, as per c), should reduce the need for some of the communication between the management teams of the two companies, and allow them to concentrate on the important issues. The management teams should have confidence in the contingency plans, and see their role as being to support the Control teams, assure themselves as per their responsibilities and ensure the welfare of the hard pressed Control team during an incident. Outside observers should also have confidence that there are well prepared, realistic and rehearsed plans, and that they are being effectively implemented as quickly as possible, without it being necessary to be told this is the case and without intervening to seek to influence the determination of a plan.

110. As already stated in this report, there are permanent links between the Eurotunnel RCC and the Eurostar Operations Centre (CRE) in Lille, Eurostar still does not have access to the ISIS tool, which would enable it to ascertain the exact position of their trains inside the Tunnel and on the Tunnel approaches. It does have this information for HS1 and on the French rail network, however. Direct access to this tool would make it much easier for Eurostar to manage its trains, especially in downgraded conditions. Eurotunnel has promised to allow Eurostar access to this tool, but this has not yet taken effect.

111. Other than these links between the RCC and the CRE, there were direct exchanges between the Chief Operating Officer or the Eurotunnel Director of Scheduling and Railway Operations from Eurotunnel and the Operations Delivery Director at Eurostar during the January incidents. These telephone exchanges are extremely useful as they allow Eurostar access to information from Eurotunnel senior managers and this information is as accurate as possible. However, it is regrettable that these were always at Eurostar's instigation. You would think that Eurotunnel would be keen to assign a Eurotunnel senior manager to ensure

that its major customer was kept informed of the situation, ongoing progress and prospects for partial or full reopening of the Tunnel.

112. Information on the prospects for full reopening of the Tunnel varied considerably:

- Eurotunnel's Chief Operating Officer said at 1800 hrs on Sunday 18th January, that repair work on Interval 4 would be finished by the morning of Tuesday 22 January if all went well.
- From 1800 hrs on Monday 19th, the Eurotunnel Chief Operating Officer indicated that repair work on the very same interval would be finished by the morning of Wednesday 21 January if all went well.
- Finally, on Wednesday morning, Eurotunnel hoped to resume service in Interval 6 during the course of the day, only to say in the early afternoon that it would only reopen mid-morning of the following day.

113. It is not unusual for successive announcements to change as a result of a variety of very valid technical reasons and we certainly should not blame Eurotunnel for the changes in the announcements, but for the fact that they had erred towards the side of optimism. Conversely, it is not acceptable for Eurotunnel to have ceased to provide any public predictions for full reopening of the Tunnel on Wednesday evening, Thursday or Friday.

114. Furthermore, whilst Eurotunnel and Eurostar senior managers should, of course, maintain contact, they cannot spend too much time liaising, especially at such difficult times.

Recommendation 18 regarding communications between Eurotunnel and Eurostar in case of an incident and the establishing of a general communication agreement: This is why we propose that exchanges between the Eurotunnel RCC and the Eurostar CRE should be genuinely regular and consistent. While the information provided by the ISIS tool would allow Eurostar to be aware of the precise location of its trains in the Tunnel, whether they are moving or stationary. However, it must receive regular information on the situation in the Tunnel, the site of the incident, how it is being handled and ongoing progress, and it must also be informed of the prospects for resuming operation in the various Tunnel intervals and for full reopening of the Tunnel.

This would then make it less essential for senior managers to talk as frequently, even though it is obviously useful for them to talk directly. The RCC-CRE link would be the sole link, or at least the preferred link.

However, this assumes mutual trust, especially in connection with prospects for partial or full reopening of the Tunnel. We have held discussions with Eurostar staff and other rail companies, along with road haulage companies, who told us that Eurotunnel's forecasts for resuming operation in the Tunnel intervals were consistently too optimistic. We would therefore like to see an approach based on more pessimistic realism: it is better for customers to be able to make the best possible decisions for themselves and it is also better to be able to give them good news further down the line, rather than constant bad news.

This all needs to be recorded in a memorandum of understanding between Eurotunnel and Eurostar incorporation recommendations 9, 11, 12, 13, 14, 15, 16,17 and 19.

This protocol also concerns other clients of Eurotunnel and must be subject to the opinion of the public authorities (see recommendation 21).

(ii) Communication with the press

115. The January incidents were characterised by chaotic management of communication between Eurotunnel and the press.

116. The information issued by the press, especially the UK press, has a relatively minor, but by no means negligible, influence on the road haulage firms who are Eurotunnel's direct customers, and a slightly greater influence on customers in private cars who have booked to use the Tunnel. This is because they are notified of incidents, waiting times and, where applicable, scheduled reopening times by Eurotunnel by means of text messages and tweets.

117. However, Eurostar customers, although they may receive e-mails, text messages and/or tweets from Eurostar notifying them of train cancellations or delays, are evidently sensitive to the news they hear on the radio or read in the press.

118. For example, The Times reported that, according to a Eurotunnel spokesperson on Saturday 17th January, "Eurotunnel is in the process of removing the affected shuttle and restoring service in the other bore of the Tunnel. Full service in both bores will be restored on Sunday."

119. There is a marked contrast between this report and the discussions held on the same day at 14:45, when Eurotunnel's Chief Operating Officer spoke to the Eurostar Director of Operations Delivery on the telephone, saying that: "Traffic will be suspended for several days".

120. According to the press article of the Daily Mail published on 17 January at 17:12 (GMT), Eurotunnel's Director of Public Affairs in the UK denied that there had been a fire, whereas the fire had been confirmed at 15:44. It seems surprising that the Director of Public Affairs had not yet been informed and if it is so, it demonstrates the absolute necessity of ensuring that Eurotunnel's communication managers maintain extremely close links with the RCC. Or, if this information provided by the Daily Mail was not up to date when published on their web site.

121. In the morning of Sunday, 18 January, the Tunnel was closed to Eurostars for just over two hours. However, Eurotunnel's press relations officers didn't seem to have been informed of this service interruption, as they told the press that the south bore of the Tunnel was open and that Eurostar should assume responsibility as the train operator.

122. This contradictory information is very disturbing for Eurostar's customers, since they are private individuals who read the newspapers and listen to the radio, yet also receive e-mails, text messages and tweets from Eurostar itself. How are they supposed to know whether they can trust the information they receive directly from the railway company or not? What's more, this creates an unsatisfactory climate of distrust between the Tunnel manager and its major customer, even though they are both aware that it is in their common interest to ensure that

the Tunnel operates smoothly and that clients are kept well-informed in the event of an incident.

Recommendation 19 concerning communication with the press:

We therefore propose that, in the event of disruptions, communications with the press should be coordinated though not joint, , and should be put in place using the same phrases in the interests of all, both operators and direct and indirect clients. This presupposes that the Eurotunnel and Eurostar spokespersons are in contact with each other and maintain close links with the operating teams, i.e. the RCC and CRE. As mentioned above, this assumes mutual trust, especially with regard to prospects for partial or full reopening of the Tunnel. We would like to see an approach based on more pessimistic realism: it is better for customers to be able to make the necessary decisions and it is also better to be able to give them good news further down the line, rather than constant bad news.

This all needs to be recorded in a general memorandum of understanding between Eurotunnel and Eurostar, covering information and communication in the event of disruptions and outlining the principles to be observed. It is essential to define the principles to be observed in emergency situations in advance. This agreement should be approved by the IGC. It will be easier to draw up such an agreement if both companies have met in advance to discuss and define operating plans for services in adverse conditions, as we recommended.

6.5 Public authorities

123. The IGC has overall responsibility for monitoring the safety of the Channel Tunnel via its Safety Authority, even though economic rail regulation will be transferred to the ARAF in France and the ORR in the UK.

124. The IGC is however responsible for ensuring that Article 13/3 of the Treaty of Canterbury is applied: “The Concessionaires shall ensure the continued flow of traffic in the Fixed Link under satisfactory safety conditions.”

125. In the event of incidents, Eurotunnel must notify the fire and emergency services immediately. In France, this is the Service départementale d’incendie et de secours (SDIS), along with its operations centre (CODIS), and the Police de l’air et des frontières (PAF) (Air and Border Police) for police and safety-related issues, and in the UK, the relevant parties are Kent Fire and Rescue Service and Kent Police.

126. The services in question immediately send the necessary resources to deal with incidents, put out a fire, and to provide emergency assistance to any victims. If the incident takes place in France, the FR FLOR are deployed in the first instance, the service being provided by a private company contracted to Eurotunnel, followed by the FR SLOR, which is provided by the French public fire brigade. In the UK, Kent Fire and Rescue Service is both the UK FLOR and the UK SLOR.

127. Whilst the FLOR are able to move freely throughout the Tunnel, the same does not apply to the SLOR, who are not allowed to cross the border unless a BINAT has been granted by the Sub-Prefect of Calais or by the Head of KFRS, who then takes control of the emergency operations rather than the Eurotunnel managers.

128. At 12:28 on 17 January, CODIS and KFRRS were notified of the incident that had occurred at 12:23. They were informed that the CO reading was 300 ppm.

129. The Sub-Prefect of Calais was notified at around 15:15, initially by the duty-sub prefect, who had himself been notified by CODIS, and he then received a telephone call to the same effect from Eurotunnel at around 15:20.

130. It is surprising that it took so long for the information to be passed from CODIS to the Sub-Prefect of Calais.

131. It is also surprising that the Sub-Prefect was not notified directly by Eurotunnel of this incident at an earlier stage in the proceedings.

132. During the feedback stage, the Sub-Prefect also asked to be informed as soon as people have been evacuated from trains or from their shuttle in the future.

133. The Sub-Prefect of Calais, if the incident occurs in France, or the Kent Police Chief if the incident takes place in the UK, have the power to instigate a BINAT, allowing the SLOR firefighters to cross the border in the Tunnel.

134. We have already suggested that the IGC should consider the possibility of introducing a "light" version of a BINAT to enable firefighters from the country in which the incident has not taken place to be able to assist the firefighters in the other country under Eurotunnel's control.

135. Eurotunnel reports incidents to a wide range of government bodies in the UK and France, in accordance with its obligations and on past request from various organisations. The procedure is documented by Eurotunnel in an internal publication C70/999/DG0/SAFD/0403/9/UG/EXN/4, which was last reviewed on 27th June, 2014. We have reviewed this document. It contains the statutory obligations to report incidents within 30 minutes or within 3 days, depending on severity, in accordance with legislation in the UK and France. The reporting is to the Channel Tunnel Safety Authority ("CTSA"), Bureau d'Enquête sur les Accidents de Transport Terrestres ("BEA-TT"), Rail Accident Investigation Branch ("RAIB") and the Office of Rail and Road ("ORR"). The notification is by telephone and/or email for the 30 minute advices, and by means of a "safety related incident report" for the 3 day advices. There is no provision in the policy for an update to the incident advice to be updated as it develops and concludes.

136. In practice another list of local and national government bodies has developed alongside this list, and many of these bodies want to receive an immediate phone call from a senior person at Eurotunnel, in addition to the statutory advice requirements. During the early stages of an incident this can be a significant task for Eurotunnel's management team.

Recommendation 20 regarding procedures for communication with public authorities in case of an incident:

The Intergovernmental Commission for the Channel Tunnel, as the governments' representatives, the Channel Tunnel Safety Authority and Eurotunnel should jointly review Eurotunnel's procedure and past demands for incident advice with a view to improving the effective communication to government bodies within the UK and France, and documenting this for everyone's clarity. Where a local or national

government department requires to be informed, it should be possible to envisage one of the government bodies listed above passing on the incident details or Eurotunnel giving the advice, but by a group email from within the Eurotunnel RCC organisation rather than individual phone calls. Consideration should also be given as to how best to update and conclude the advice where there is a need to do this. The three parties should work together to ensure that the list of those requiring communication during an incident is kept up to date, and reviewed regularly.

137. In addition, we feel that the authorities may be concerned by Eurotunnel's communications, especially to the press.

**Recommendation 21 concerning a general agreement between Eurotunnel and Eurostar concerning communications in the case of an incident:
This is why we suggest that the authorities should be kept informed of the general memorandum of understanding on information and communication between Eurotunnel and Eurostar and that they should offer their thoughts on the draft agreement via the IGC.**

VII Conclusion

138. The IGC has a statutory responsibility to supervise “*the continued flow of traffic in the Fixed Link under satisfactory safety conditions*”. This Review sets out recommendations for how the continued flow of traffic can be assured by the IGC, and suggests that to do this the IGC needs to take a greater interest and oversight in matters concerning the management of performance in the Channel Tunnel. This is necessary because incidents of poor performance have an increasingly significant impact on both the UK and France far away from Eurotunnel's area of direct influence, from economic impact, motorway closures through to issues with migrants. Eurostar and Eurotunnel's businesses continue to successfully grow, and have significant shares of the markets for passenger and goods transport across the Channel. They are of such importance to the UK in particular, that the IGC, as the custodian of the governments' interests connected with the Channel Tunnel, should broaden its activities to take an active interest in performance matters, as distinctly separate from safety.

139. Eurotunnel take performance very seriously, and have appropriate commercial incentives to do so. This should continue, and relationships with their well informed customers, in particular Eurostar, should play an important part in future performance management. Constructive challenge between these parties should serve to improve performance to their mutual benefit. The IGC's role should be one of encouragement, oversight and assurance, and not one of intervention and instruction. Our review makes recommendations on how this can be done.

140. In respect of communications during disruption, between all the interested parties, including customers, there is more work to do. New media and technology has been embraced and is increasingly well used, but consistency and transparency are not meeting customers' expectations. Traditional media still has a role to play, and of course they take an interest in Channel Tunnel matters. This can be more effectively handled by the parties involved if they work better together. Each party, from Eurotunnel, through Eurostar to Highways England and the Sous Préfet de Calais, have their different responsibilities to perform during an incident, and all can do these well only if there is an efficient, regular and

transparent flow of information between the parties. Our review makes recommendations on how this can be improved.

141. Eurotunnel is a significant transport undertaking, growing rapidly and playing an increasingly important and essential part in the economy and societies of the UK, France and Europe. It is doing this with a successful, reliable and well-managed product. Our review underlines this, and suggests ways for this to improve further, through a continuation and enhancement of the close working relationships Eurotunnel must have with all its customers..

142. Finally we would like to thank everyone who we met in the preparation of this review, for the contributions they made, and the constructive and transparent manner in which they engaged with us.

Annex 1 – List of recommendations

Recommendation 1 concerning the procedure for BINAT activation

Note that this BINAT is officially supposed to be issued following an exchange of faxes. A more modern procedure might be more appropriate, although, from an operational point of view, this doesn't really pose any obstacles to the proceedings.

Recommendation 2 concerning the possibility of a a “light” BINAT

We suggest that the IGC should consider the possibility of introducing a “light” version of a BINAT in which the SLOR of the country in which the incident has not taken place is able to cross the border to assist its colleagues. This would come under Eurotunnel's operational responsibility.

Recommendation 3 concerning the stacking of heavy goods vehicles in France in case of disruptions in the tunnel

We propose regular consultation sessions between the French authorities and Eurotunnel to review the situation around the outskirts of the Tunnel and prospects for increased car and HGV traffic. These should also work out solutions for dealing with existing or potential problems in the interests of all. We also propose that Eurotunnel gives clear and reliable information about the severity of the disturbances in the tunnel and the projected period of disturbance with reasonable pessimism. This would enable a dialogue between the authorities, Eurotunnel and haulage companies to decide if it would be preferable to stop lorries well before the Calais area for the duration of the disturbances.

Recommendation 4 concerning operation Stack in England:

Eurotunnel, Highways England and Kent Police should be encouraged by the IGC to develop an improved relationship, based around better communications, enabling everyone to make better decisions. They should review their real time communications between their Control Centres and consider implementing a process of email advice and regular updates. This should not replace the regular direct phone contact between their Control Centres, which is necessary for parties to engage and jointly develop a plan of action. However in a busy Control Centre environment, emails can play a significant role in consistency and clarity, as well as easily providing regular updates, even when the update is simply to say that a situation is unchanged. The development and sharing of effective contingency plans by Eurotunnel, for operations, customer handling, customer, stakeholder and media communications should form the basis of what all parties should expect when an incident occurs. The contingency plans should include a common set of terms covering a wide range of anticipated incidents impacting on the Channel Tunnel. This in turn should enable more effective decision making by all parties, and a more consistent approach to communicating with customers, stakeholders and other third parties.

It is our view that better communications between all parties, resulting in each party making better informed decisions in respect to their area of responsibility, will result in more effective use of the available facilities during an incident, and a better flow of information to customers and other stakeholders.

Recommendation 5 regarding the maintenance and renewal procedures of railway equipment in the tunnel:

To these aspects, we can add premature rail failures due to corrosion, Due to the specific atmosphere in the Tunnel, with temperatures of 25° Celsius, very high levels of humidity, especially in certain areas, called wet zones, and metallic dust in suspension, the corrosion of certain components is considerably more than you might expect to railway equipment in the open air. As a result, maintenance standards and the frequency of detailed inspections of the facilities need to be adapted accordingly.

Recommendation 6 concerning pagodas:

We therefore propose that the various ongoing research programmes should all be continued, while forming part of a global systemic study with a view to simultaneously assessing the various problems to be resolved in the light of the experience of other infrastructure managers and of rail operators and the very specific conditions that apply in the Channel Tunnel, including the speed of the freight shuttles. The IGC should play a full part in this study programme.

Eurotunnel should not be able to install equipment (pagoda, deflectors...) on the shuttles without having obtained authorization from the CTSA and the IGC.

Recommendation 7 concerning Eurotunnel performance:

Eurotunnel and Eurostar should be encouraged by the IGC to further develop their regular performance management discussions, including the sharing of data, trends, analysis and action plans by both parties, to their mutual benefit. Both parties should identify other similar railway undertakings with which to benchmark the performance of trains, rolling stock and infrastructure. Key performance indicators should be agreed and reviewed regularly.

The IGC should consider holding an annual meeting with Eurotunnel dedicated to annually reviewing the previous year's train performance, and projections for the year to come. This should review key performance indicators, emerging trends of performance of all trains and shuttles through the Channel Tunnel, the factors effecting performance and management's improvement plans. Eurostar, DB Schenker and GBRF should be invited to make representations. In this way the IGC can assure itself of the continued flow of traffic on an annual basis, and that the relationships between Eurotunnel and its customers are functioning and driving a culture of continuous improvement within all the organisations involved.

Recommendation 8 regarding the real time management of traffic flow:

Eurotunnel should make available a security protected web based visualization of train location within the concession to Eurostar and the freight operators. They could also make the data behind it available so that can be used in their other applications, as soon as possible. Eurotunnel assured us that all this will be done by September 2015; with regard to Eurostar, integration would be put in place in December 2015. The IGC should ensure that this information is supplied appropriately.

Recommendation 9 concerning communications between Eurotunnel and railway companies:

Eurotunnel, Eurostar and the freight operators should review their real time communications between Control Centres and consider implementing a process of

email advice and regular updates which is consistent with the best practice of the other networks used by Eurostar. This should not replace direct phone contact between the Control Centres, which is necessary for parties to engage and jointly develop a plan of action. However in a busy Control Centre environment, emails can play a significant role in consistency and clarity, as well as easily providing regular updates, even when the update is simply to say that a situation is unchanged.

Recommendation 10 concerning communications between control centre teams:

The relationships between the Control Centre teams, and understanding of each other's needs, should continue to be strengthened at every opportunity. The new proximity of most of the teams in Lille and Calais should make this easier.

Recommendation 11 concerning the content of Eurotunnel communications in the case of an incident:

Eurotunnel and Eurostar should review the messages used by all sources during an incident, and determine a range of honest and understandable statements in line with best practice amongst infrastructure managers and rail freight operators in the UK and France.

Recommendation 12 concerning the information communicated by Eurotunnel to communicants :

Eurotunnel must ensure that there is a person in the RCC in charge of communicating accurate real time information to communicants about the development of the situation and the prospects of opening or closing various intervals of the tunnel

Recommendation 13 concerning the communication with passenger shuttle passengers in case of an incident:

Although the use of targeted text and twitter is in its early days, it is generally effective and welcomed by customers, and should be encouraged. Best practice amongst other transport operators in the UK should also be identified and adopted. In particular regular updates to their customers should be provided by both Eurotunnel and Eurostar; even if there are no new developments. Customers should be further encouraged to provide their mobile phone number or email for this purpose, and research undertaken to establish what proportion of Eurotunnel customers receive communication in this way, and what they think of it. Finally Eurotunnel should engage with Eurostar to seek a degree of message consistency during an incident, across websites, text and social media.

Recommendation 14 concerning the communication with road hauliers in case of an incident:

Eurotunnel should review the message frequency and content sent to road haulage companies during disruption, and make use of the regular updates from the RCC suggested elsewhere in this report to provide informed and regular updates, even when there is no change in the situation.

Recommendation 15 concerning the communication with rail freight companies:

Eurotunnel should review their real time communications with the rail freight operators and consider implementing a process of email advice and regular updates

which is consistent with the best practice of the other networks. This should not replace direct phone contact between the Control Centres, which is necessary for parties to engage and jointly develop a plan of action.

Recommendation 16 regarding the necessity of contingency plans:

The work on embedding contingency plans into the business continuity of Eurotunnel and Eurostar in particular should continue, and should be broadened to include all departments in each company. Well-prepared, realistic and rehearsed joint contingency plans reduce the amount of decisions needed during an incident. This should accelerate the implementation of an effective plan, improve customer information, give a more consistent response regardless of who is on duty and reduces tension between organisations during an incident. Observers should recognise that contingency plans have their limits, particularly in the initial hours after an incident when the operation has to be switched from normality, through stop and restart, to switch over to a contingency plan. Generally the longer distance the services involved, the more difficult and prolonged this switch over is.

Recommendation 17 concerning the communication between management teams in the case of an incident:

The wider adoption of pre-prepared contingency plans across Eurotunnel and Eurostar, as per c), should reduce the need for some of the communication between the management teams of the two companies, and allow them to concentrate on the important issues. The management teams should have confidence in the contingency plans, and see their role as being to support the Control teams, assure themselves as per their responsibilities and ensure the welfare of the hard pressed Control team during an incident. Outside observers should also have confidence that there are well prepared, realistic and rehearsed plans, and that they are being effectively implemented as quickly as possible, without it being necessary to be told this is the case and without intervening to seek to influence the determination of a plan.

Recommendation 18 regarding communications between Eurotunnel and Eurostar in case of an incident and the establishing of a general communication agreement:

This is why we propose that exchanges between the Eurotunnel RCC and the Eurostar CRE should be genuinely regular and consistent. While the information provided by the ISIS tool would allow Eurostar to be aware of the precise location of its trains in the Tunnel, whether they are moving or stationary. However, it must receive regular information on the situation in the Tunnel, the site of the incident, how it is being handled and ongoing progress, and it must also be informed of the prospects for resuming operation in the various Tunnel intervals and for full reopening of the Tunnel.

This would then make it less essential for senior managers to talk as frequently, even though it is obviously useful for them to talk directly. The RCC-CRE link would be the sole link, or at least the preferred link.

However, this assumes mutual trust, especially in connection with prospects for partial or full reopening of the Tunnel. We have held discussions with Eurostar staff and other rail companies, along with road haulage companies, who told us that Eurotunnel's forecasts for resuming operation in the Tunnel intervals were

consistently too optimistic. We would therefore like to see an approach based on more pessimistic realism: it is better for customers to be able to make the best possible decisions for themselves and it is also better to be able to give them good news further down the line, rather than constant bad news.

This all needs to be recorded in a memorandum of understanding between Eurotunnel and Eurostar incorporation recommendations 9, 11, 12, 13, 14, 15, 16, 17 and 19.

This protocol also concerns other clients of Eurotunnel and must be subject to the opinion of the public authorities (see recommendation 21).

Recommendation 19 concerning communication with the press:

We therefore propose that, in the event of disruptions, communications with the press should be coordinated though not joint, , and should be put in place using the same phrases in the interests of all, both operators and direct and indirect clients. This presupposes that the Eurotunnel and Eurostar spokespersons are in contact with each other and maintain close links with the operating teams, i.e. the RCC and CRE. As mentioned above, this assumes mutual trust, especially with regard to prospects for partial or full reopening of the Tunnel. We would like to see an approach based on more pessimistic realism: it is better for customers to be able to make the necessary decisions and it is also better to be able to give them good news further down the line, rather than constant bad news.

This all needs to be recorded in a general memorandum of understanding between Eurotunnel and Eurostar, covering information and communication in the event of disruptions and outlining the principles to be observed. It is essential to define the principles to be observed in emergency situations in advance. This agreement should be approved by the IGC. It will be easier to draw up such an agreement if both companies have met in advance to discuss and define operating plans for services in adverse conditions, as we recommended.

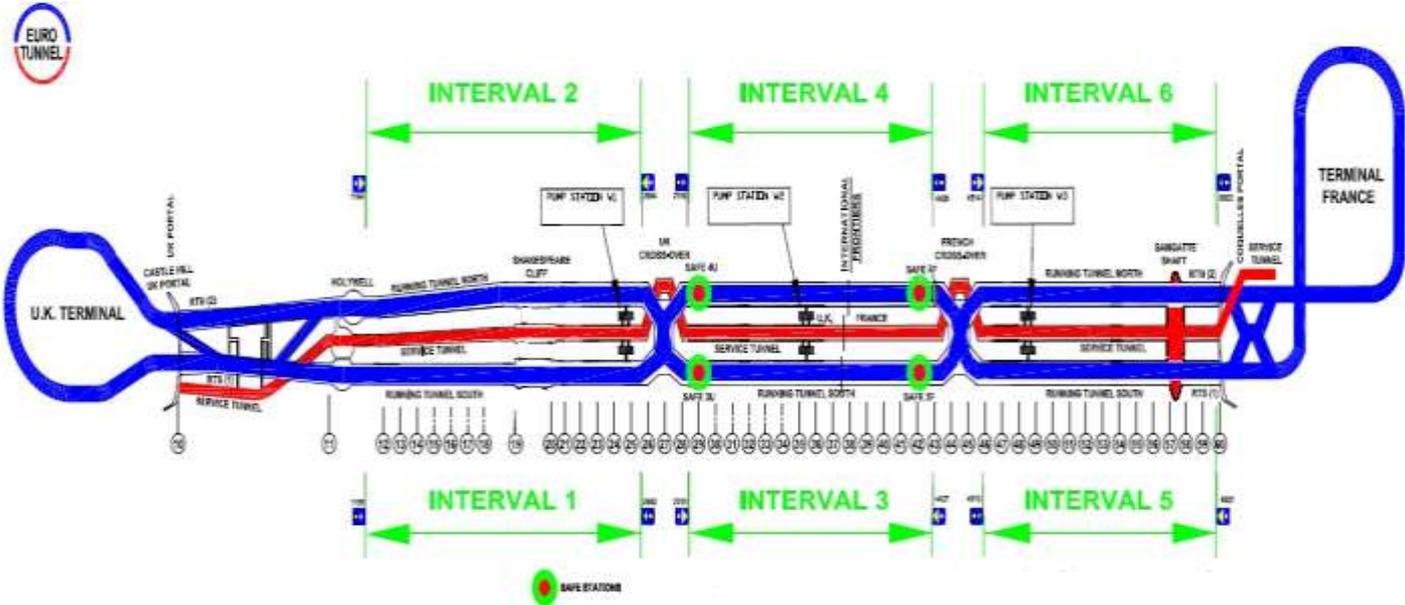
Recommendation 20 regarding procedures for communication with public authorities in case of an incident:

The Intergovernmental Commission for the Channel Tunnel, as the governments' representatives, the Channel Tunnel Safety Authority and Eurotunnel should jointly review Eurotunnel's procedure and past demands for incident advice with a view to improving the effective communication to government bodies within the UK and France, and documenting this for everyone's clarity. Where a local or national government department requires to be informed, it should be possible to envisage one of the government bodies listed above passing on the incident details or Eurotunnel giving the advice, but by a group email from within the Eurotunnel RCC organisation rather than individual phone calls. Consideration should also be given as to how best to update and conclude the advice where there is a need to do this. The three parties should work together to ensure that the list of those requiring communication during an incident is kept up to date, and reviewed regularly.

Recommendation 21 concerning a general agreement between Eurotunnel and Eurostar concerning communications in the case of an incident:

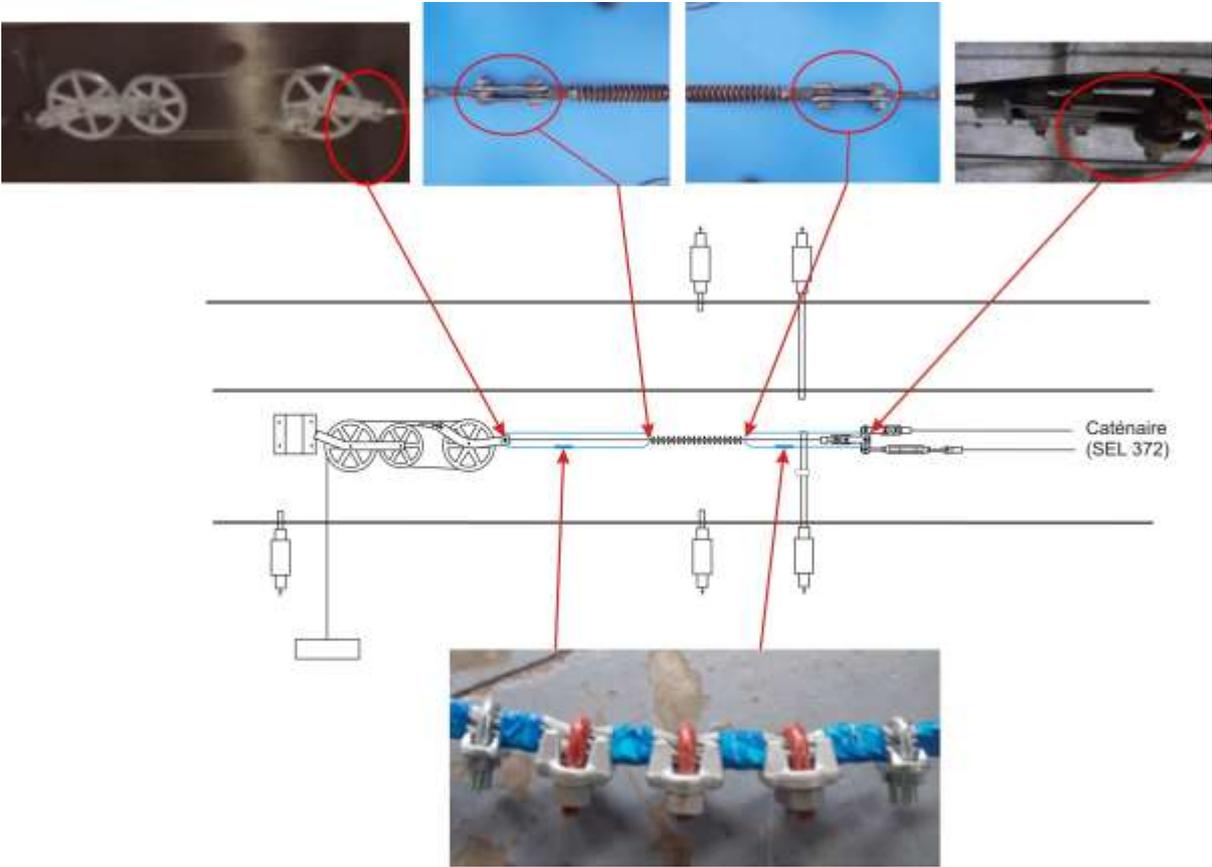
This is why we suggest that the authorities should be kept informed of the general memorandum of understanding on information and communication between Eurotunnel and Eurostar and that they should offer their thoughts on the draft agreement via the IGC.

Annex 2 – Tunnel schematic (courtesy of Eurotunnel)



Annex 3 – Chronology of incidents – attached separately

Annex 4 - Flying tails



Annex 5 - Photos of burnt trucks (courtesy of the UK Rail Accident Investigation Branch)



Annex 6 - Interval chronology document (courtesy of Eurotunnel) - attached separately

Annex 7 – Example of communications – attached separately

Annex 8 - Photos of pagodas

BREDA wagon



ARBEL wagon



Annex 9 - List of organisations and job titles of participants interviewed by the authors

Organisation	Job title of participant interviewed
Préfecture de Nord-Pas de Calais	Sous-Préfet
Eurotunnel	Chairman and Chief Executive Officer
	Chief Operating Officer
	Director of Safety and Sustainable Development
	Director of Infrastructure Maintenance and Logistics
	Director of Scheduling and Railway Operations
	Customer Experience Director
	UK Customer Services Director
	Director of Public Affairs
Eurostar	Chief Executive Officer
	Head of Safety
	Director of Operations Delivery
	Director of Train Services
	Deputy Control Room Manager
	Control Room Manager
GB Railfreight	Production Director
DB Schenker	Head of Planning
Kent Police	Inspector, Channel Tunnel Frontier Operations
Channel Tunnel Safety Authority	Co-chair of rescue and public safety working group
Kent Fire and Rescue Service	Group Manager, Operational planning
UK Road Haulage Association	Head of International Affairs
Highways England	Asset Development Manager
	Business Assurance Team Leader
	National Traffic Operations Centre Team Leader

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