BEATT

Bureau d'Enquêtes sur les Accidents
de Transport Terrestre

ANNUAL REPORT
2017

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Land Transport Accidents Investigations Board

ANNUAL REPORT

2017

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A word from the director

Ladies and gentlemen,

I have the honour to present to you the BEA-TT annual report for 2017. You will note that in keeping with the trend observed in 2016, the number of incidents or accidents that justified being selected for a technical safety investigation was low last year. In particular, in the railway sector, no accidents have occurred in the field of mandatory surveys as defined by the European Railway Safety Directive.

In total in 2017, only 6 new investigations were initiated: 2 involving the national rail network, 1 ski lifts, 1 passenger road transport and 2 accidents at level crossings, including the particularly dramatic event in Millas on 14 December 2017, in which 6 teenagers lost their lives and 17 others were injured.

During this year, 14 investigations were concluded, 4 in the form of a simple analysis sheet and 10 as reports formulating a total of 38 recommendations. Among the latter, it is worth mentioning the report on the collision on 23 October 2015 in Puisseguin between a coach and a road train that killed 43 people, and the report concerning the derailment of a TGV train testing the new East-European line on 14 November 2015 in Eckwersheim, in which 11 people died and 21 were seriously injured. The BEA-TT presented its findings on the causes of and circumstances surrounding these two incidents to the victims and their families before the report was made public.

2017 was also a year of change for the BEA-TT. In April, the department left the Pascal B tower to settle on the 29th floor of the renovated south wall of the Grande Arche de La Défense. The rail and guided transport division had its staff completely renewed, and that of the road and river surveys had to operate with only 60% of its resources, because of a serious health incident of one of its investigators and a vacant position. Despite these uncertainties, the BEA-TT was able, alongside its basic missions, to contribute to the Assises de la Mobilité as part of the thematic workshop on safer mobility and to continue its active participation in the work of the European network of "National Investigation Bodies (NIBs)" as well as feedback sessions organised by the French Public Railway Safety Establishment.

In accordance with the provisions of the Transport French legislation, in this report you will find details of the inquiries opened, as well as the summary of the conclusions of the investigations closed in 2017, with, in appendix, the progress of the follow-up given to the recommendations made in the reports from previous years.

I hope you will find this report interesting and remain available for any comments that you may have.

Jean PANHALEUX

1 - Roles and organisation of BEA-TT

1.1 - Reasons for investigating technical accidents

The human dramas caused by transport accidents and the spectacular damage they can cause remind us that people, equipment and organisations are fallible despite the progress made in safety terms.

Public authorities, accident victims and travellers are constantly demanding that the lessons from the most serious or complex accidents or incidents should be learned independently.

This involves analysing the circumstances and causes of these accidents in order to establish safety recommendations that could prevent them happening again, in the form of a technical investigation and an in-depth and transparent approach. Since highly-qualified and independent investigators need to be mobilised and the lessons learned capitalised on, these technical investigations are assigned to a permanent specialised organisation. This has been the role of the Land Transport Accidents Investigations Board (BEA-TT) since 2004.

Its scope covers rail transport, guided urban transport systems (underground railway and tram), ski lifts, road transport (particularly goods and public passenger transport) and navigation on internal waterways, each of these sectors having its own regulations and economic, technical, professional and even cultural logic.

Decisions to open technical investigations are made by the director of BEA-TT on his/her own initiative or at the request of the minister of transport. In the rail transport area, investigations must be carried out for all serious accidents as defined by EU directive 2016/798 of 11 May 2016 on rail safety.

This technical investigation must be completely different from a judicial investigation, which has different objectives focused on establishing responsibility, and different constraints, particularly in terms of deadlines.

In order to carry out their work effectively, technical investigators are commissioned to access all useful documents, evidence and information, even if covered by judicial, professional or medical secrecy. These are legal prerogatives.

On conclusion of the investigations or studies carried out, BEA-TT publishes its reports on its website: www.bea-tt.developpement-durable.gouv.fr. It notifies the recipients of the safety recommendations it makes.

1.2 - Organisation and resources

BEA-TT is organised around its main role, i.e. conducting technical investigations on accidents and incidents. For this purpose it enlists three categories of participants:

- firstly, its own full-time investigators;
- secondly, temporary investigators commissioned by its director for the purposes of an investigation and who benefit from the legal status of technical investigators; these can be active or retired agents of a transport company, an infrastructure management agency or a body of civil servants in charge of inspection or monitoring assignments;
- finally, experts appointed to answer precise questions.

In addition, in accordance with its statutes, BEA-TT may call on all competent state services in its field: this is particularly the case for accident monitoring and notification.

In practice, investigations are carried out by permanent investigators, if applicable, with the support of temporary investigators and experts selected according to the external expertise considered necessary to analyse the accident in question.

On 1 January 2017 BEA-TT had 14 authorised agents: 2 executive staff, 8 permanent investigators, 1 head of assignment and 3 administrative agents. One physician from the General Labour Inspectorate has also been seconded to it to deal with medical aspects.

Its 2016 budgetary allocation for operations and studies was €100,000.

2 - Feedback on the incidents of the previous year

2.1 - Accident and incident reporting

As stipulated by the Transport French legislation, land transport incidents and accidents are brought to the attention of BEA-TT at the earliest opportunity after they have occurred. In practice, this feedback is mainly provided through the bulletins and the reports from the Ministerial Center of Operational Intelligence and Warning (CMVOA) of the ministry for an ecological and solidary transition and the cohesion of the territories, from the daily reports of the Interdepartmental Crisis Management Operational Centre (COGIC) of the Ministry of the Interior, as well as alerts and daily reports from some major transport operators.

The first thing done by BEA-TT is to use this information in order to be able to determine whether it is appropriate to open an investigation. Given the large number of reported events, this necessary and daily task is a very time-consuming activity and it has not previously been explicitly mentioned in the department's annual report. The use of this feedback has been recorded since 2017; from 1 January for road transport and from 1 July for rail and guided transport.

The summary of this analysis is as follows:

	Period	Reported events	Analysed events	Selected events
Road and river transport division	12 months	1378	242	3
Rail and guided transport division	6 months	928	52	3*

(*): including one investigation opened during the first quarter

2.2 - Investigations opened in 2017

BEA-TT undertook 6 investigations in 2017 concerning the following:

- for the **road division**, a bus leaving the road and two collisions occurring at a level crossing;
- for the **railway division**, two accidents, a derailment and two TERs almost catching up to each other;
- as for the **ski lifts division**, the derailment of a cable car cabin.

2.2.1 - Rail and guided transport divisions

1) Derailment of three cars of a freight train carrying ethanol, which occurred on 13 March 2017, at the entrance to the Sibelin shunting yard, in the municipality of Solaize (69)

On 13 March 2017 at 04:05, a dangerous goods train with 22 tank cars loaded with bio-ethanol derailed on arrival at the Sibelin shunting yard, south of Lyon (Rhône department).

Two cars were lying on their side, a third that struck the two previous ones was derailed and lost its cargo. The ORSEC accident plan for the transport of dangerous goods was triggered. Firefighters were present all day to plug the leak and secure the site against the risk of fire. The rail traffic was disrupted in the area for 24 hours.

The material damage was significant: 80 meters of track was destroyed and 30 tonnes of ethanol spilled into the environment.

2) Two TERs almost catching up to each other on the Miramas - Martigues line, on 18 August 2017 in Ensuès-la-Redonne (13)

On 18 August 2017 at 8:34 am, the driver of a TER traveling at 75 km/h saw the taillights of a TER ahead of it. He triggered the emergency braking system and stopped a short distance from the train in front, just avoiding a collision caused by catching up with that train.

The signalling equipment on the double-track line is of the type "automatic block with restricted permissiveness". The signal was clear for the train, which had to brake urgently. The same signal had been experiencing a service problem when the first train had gone past.

This event, which could have been serious, caused no casualties and did not do any damage.

3) Télémétro derailment, which occurred on 12 January 2017 in La Plagne (73)

On 12 January 2017, at 21:04, during heavy snow, a "Télémétro" cable car in La Plagne (Savoie) took the carrier cable with it as it passed over the P2 pylon. The carrier cable came off its support and was caught by the guide rollers of the towing cable. The cabin derailed and stayed balanced on the cable.

The operator in charge of driving made many attempts to restart in vain. The four passengers were finally evacuated vertically and were unscathed.

2.2.2 - Road and river transport division

1) Loss of control of a bus on 8 January 2017, on the A-road RN 79 in Charolles (71)

On the night of 7 to 8 January 2017, at around 04:12, a bus coupled to a trailer, which was transporting 32 people from Portugal to Switzerland, came off the N79 at the end of a viaduct in the municipality of Charolles (department of Saône-et-Loire).

This accident cost the lives of 4 people, all passengers on the bus. It also resulted in the hospitalisation of 28 people, including 3 extreme emergencies and 25 relative emergencies.

2) Collision between a TER and a light vehicle that occurred on 2 November 2017 at level crossing no. 8, in Bonneville-sur-Touques (14)

2 November 2017 at 15:52, a TER traveling on the single track between Lisieux and Deauville collided with a light road vehicle on level crossing no. 8 situated in the town of Bonneville-sur-Touques in Normandy.

The level crossing, which allows the crossing of a municipal road, is not equipped with light signals. It is equipped with a sign (stop sign topped with a St. Andrew’s cross-style sign).

The three occupants of the vehicle are killed on impact. The TER derailed. The driver and passengers of the train were not injured.

3) Collision between a TER and a school bus on 14 December 2017, at level crossing no. 25, Millas (66)

On Thursday 14 December 2017, a passenger train connecting Villefranche with Perpignan station hit a school bus on level crossing no. 25, located on B-road 612 in Millas in Pyrénées-Orientales.

This violent collision resulted in the deaths of 6 teenagers and 17 others were injured.

3 - Published reports

3.1 - Rail transport

3.1.1 - Investigations concluded in 2017

Three investigations into rail transport accidents were concluded in 2017. The nature, dates and locations of these accidents are specified in the table below.

With regard to Directive 2016/798 of 11 May 2016 on rail safety and in view of the scale of their consequences, these three accidents did not constitute serious accidents for which a technical investigation was obligatory. But given the significance of the security risks they have identified or the conditions of their occurrence, even outside business operations, investigations have been opened.

Date	Nature and location of the accident	umber of deaths	Mode*
12.10.2015	Dual-track derailment of a TER at the Sainte-Pazanne (44) station	0	R
14.11.2015	Derailment of a TGV test train at Eckwersheim (67)	11	R
13.12.2016	Multiple rail breaks between Pons and Jonzac (17)	0	R

3.1.2 - Recommendations issued

In conclusion of these 3 reports, 14 separate recommendations were made by BEA-TT.

Nature of the recommendations

- 3 relate to the improvement of the methods used during the works or tests;
- 3 concern the development of standards or procedures;
- 2 aim at improving the training of operators;
- 2 relate to the performance of rolling stock;
- 2 relate to the evolution of railway infrastructure;
- 1 aims at improving feedback for better security;
- 1 focuses on strengthening online recording to help understand the accidents.

The recipients

Two of the above-mentioned recommendations have each been addressed, with the same wording, to several recipients, so that the total number of recommendations sent regarding the investigations in question amounts to 17, of which:

- 8 to a rail infrastructure manager on the RFN;
- 4 to a rail transport company;
- 2 to EPSF, the national safety authority;
- 2 to a prime contractor involved with the RFN;
- 1 to an entity holding wagons.

Follow-up action planned by recipients

The table below shows the follow-up action that the recipients of the above recommendations plan to carry out.

*R = rail

Investigation	Recommendations			
	Number	Accepted	Not accepted	No response
Sainte-Pazanne	7	7	0	0
Eckwersheim	7	7	0	0
Jonzac	3	3	0	0
TOTAL	17	17	0	0

3.1.3 - Monitoring the implementation of the recommendations

Independently of the intentions expressed by the recipients and summarised in paragraph 3.3 below, the National Rail Safety Authority (EPSF) monitors the effective implementation of the recommendations that BEA-TT sends to national rail network operators.

On the basis of this monitoring, the state of progress of operational implementation of the recommendations sent between 2004 and 2016 to these operators is as follows:

Year of publication of the report	Number of recommendations addressed			
	Total	Closed		In progress
		Completed	Not accepted	
2004-2006	30	28	0	2
2007	19	18	0	1
2008	21	21	0	0
2009	24	21	2	1
2010	15	12	1	2
2011	10	9	0	1
2012	15	7	4	4
2013	12	4	0	8
2014	10	7	0	3
2015	14	1	0	13
2016	23	6	0	17
Total 2004-2016	193	134	7	52

Appendix 2 to this report takes stock of this implementation.

The EPSF does not monitor the implementation of recommendations concerning the Channel Tunnel, which is outside its scope of action. This monitoring is undertaken by the Channel Tunnel Intergovernmental Commission. The follow-up is as follows for the last accident under investigation:

Year of publication of the report	Number of recommendations addressed			
	Total	Closed		In progress
		Completed	Not accepted	
2016	6	1	0	5

3.1.4 - General summaries of investigation reports published in 2017

Dual-track derailment of TER no. 859100 at the Sainte-Pazanne (44) station on 12 October 2015

On 12 October 2015 at 05:40, railcar X 73811 coming from Saint-Gilles-Croix-de-Vie and pulling regional express train no. 859100 derailed across both tracks, at low speed, on switch points 310b located at the entrance of the Sainte-Pazanne station. It stopped 30 metres down with its front bogie on track 2 and the derailed rear bogie on track 1.

The event did not kill any of the 12 passengers or any of the train staff.

The material damage was limited to the running gear of the railcar, the rear bogie of which rolled about thirty metres in the ballast, with trail through of points by the leading bogie, with about thirty metres of track covered by the derailed bogie.

This dual-track derailment follows the transfer of switch points 310b between the two bogies of the railcar.

On the one hand, this event was caused by a 2.7 second disruption on the ITE track circuit in zone 325 and, on the other hand, the Sainte-Pazanne traffic control agent's recording of an incompatible route with that of the train in question; this recording was authorised by instruction S6A no. 4 from Infra-Exploitation Pays de Loire.

Trying to find ways to progress has led to the formulation of four recommendations related to the root causes and covering the following topics:

- taking into account the phenomenon of wheels getting clogged;
- cleaning the rails after track repair operations;
- the procedures for issuing S6A no. 4 exemptions;
- the implementation of modern points.

In addition, the investigation showed that the disruption of the CDV ITE track circuits deserved specific monitoring and attention, which led the BEA-TT to formulate a fifth recommendation on this topic.

http://www.bea-tt.developpement-durable.gouv.fr/sainte-pazanne-r233.html

Derailment of a TGV train during a test run of the East-European LGV on 14 November 14 2015 in Eckwersheim (67)

On Saturday 14 November 2015 at 15:04, during an overspeed test carried out as part of the approval procedure for the second part of the East-European Line, the test train traveling on track 2 towards Strasbourg derailed shortly before the bridge over the Marne-Rhine Canal, at the entrance to the easement curve of the new line with the Paris-Strasbourg classic line in the Eckwersheim commune.

The train broke up; the front engine and the six carriages that followed it scattered across the ground situated below the track and stopped after having crossed the canal using this momentum; the tail engine fell into the canal and the two cars ahead ended up on the bank.

The victim toll was 11 dead and 21 seriously injured out of the 53 people who were on board the train.

The TGV train was completely destroyed and the railway bridge was seriously damaged.

The direct cause of the accident was the tilting of the power unit and the train from the effects of the centrifugal force resulting from an approach speed of 255 km/h in a tight bend with a 945-m radius.

This excess speed was due to the inappropriate braking considering the initial speed of the train when approaching the area that begins just before the bend in question where the recommended maximum speed is only 176 km/h.

This inappropriate braking was the product of three causal links:

- an unsuitable braking strategy, resulting from flawed reasoning when establishing the pneumatic braking point at PK 402 in order to respect the 176 km/h ceiling at PK 403,809;

- A misunderstanding between the traction transport unit (CTT) and the rest of the driving team on the braking methods, resulting in the release of the electric brake by the driver and maintaining a speed of 330 km/h until the pneumatic braking was triggered;
- an inter-phonic call during the braking, which disrupted the CTT and prevented them from seeing that the electric brake had been released contrary to the strategy that had been planned.

The root cause analysis led the BEA-TT to make six recommendations on:

- the certification standard for high-speed lines;
- preliminary risk analyses;
- the qualifications of the test-driving teams;
- the test-driving teams' equipment and methods;
- the organisation of test campaigns;
- records in the driver's cab.

The report also makes a specific recommendation to implement "loopbacks" when security systems are to be deactivated.

http://www.bea-tt.developpement-durable.gouv.fr/eckwersheim-r239.html

Multiple rail breaks when train no. 72049 passed through between Pons and Jonzac (17) on 13 December 2016

On 13 December 2016, at approximately 08:30, the 447 and 462 level crossings at Pons and Jonzac, respectively, on the Saintes - Bordeaux line section were reported as "failing to open".

The Electrical Service Officer (SES) was called to rectify the LC 447 and detected a broken rail at 09:45. Investigations on LC 462 led to the discovery of a second broken rail at 10:45 and a third at 11:40.

These findings led to the freight train no. 72049 being stopped, which had just started to travel on this section of line. During the inspection, a large flat spot was detected on the first axle of the car no. 33 87 6772 698-1 located in second position in the train. No abnormalities were detected on the other cars of the train.

The following night, during a crossing repair project between Pons and Jonzac, three new rail breaks were detected.

On the 14th, a cabin inspection between Saintes and Saint-Mariens detected two new rail breaks between Pons and Jonzac.

Over the following days, walking inspections, train inspections and auscultations were conducted along the entire train route. In total, 13 rail breaks were noted on the train's route. Twelve were in an area 50 km from the Saintes - Bordeaux line. An isolated case is located on the single track from Niort to Saintes.

These breaks were caused by violent impacts caused by the movement of a wagon in train no. 72049, on which two wheels of an axle each had a flat spot of about 110 mm.

These flat spots had appeared previously, probably following a wheel locking during an unladen route and were aggravated by another wheel locking initiated in a low-friction area located shortly after the station Mazières-en-Gâtine, the origin of the train. The axle then slid without turning to the first stop located in Niort. It started rotating again from this station.

Despite the noise and vibrations produced by the bearing of this defective axle, the train was not stopped by the running trains surveillance posts (STEM) located on its route.

The state of the track has contributed to the number of these breaks, as shown by their concentration in a small area, equipped mainly with rails dating from 1928 and 1929 and an uneven floor.

This analysis of the causes led BEA-TT to make three recommendations based on the following points:

- the self-contained empty-loaded systems fitted to certain wagons;
- the motivation of agents performing STEM in terms of detecting the flat spots on the wheels;
- the deployment of wheel defect detectors on the national rail network (RFN).

The BEA-TT is not making a recommendation in relation to the state of the infrastructure, as it is a well-known issue for the whole of the RFN and has already been the subject of recommendations in previous reports.

http://www.bea-tt.developpement-durable.gouv.fr/jonzac-r252.html

3.2 - Road transport

3.2.1 - Investigations concluded in 2017

Two reports dealt with road traffic accidents (not including level crossings and intersections with tramlines).

The table below sets out the locations and dates of the two accidents under consideration, which cost the lives of 44 people.

Date	Nature and location of the accident	Number of fatalities
17/08/15	Accident between a cyclist and a truck in Paris 9th	1
23.10.2015	Collision followed by a fire between a bus and a HGV* in Puisseguin (33)	43

These accidents highlighted the need to reinforce the technical standards relating to the consideration of fire risk in the design and construction of coaches, as well as the risks associated with blind spots with regard to the vulnerability of cyclists.

3.2.2 - Recommendations issued

Nature of the recommendations

On conclusion of these two investigations, BEA-TT issued 9 separate recommendations:

- 6 relate to vehicle layout regulations;
- 2 relate to the awareness of vehicle drivers of the risks incurred because of the lack of visibility;
- 1 relates to the development of infrastructure around self-service bicycle stations.

Recipients

Two of the recommendations were each sent with the same wording to several recipients and a total of 16 recommendations have therefore been sent, including:

- 5 to an HGV manufacturer;
- 2 to Paris town hall and 1 to the Paris police prefecture;
- 8 to Directorate Generals of Ministries (DGEC, DSR and DGITM).

3.2.3 - Follow-up action planned by recipients

The table below shows the follow-up action that the recipients of the above recommendations plan to carry out.

Investigation	Recommendations			
	Number	Accepted	Not accepted	No response
Puisseguin	5	5	0	0
Paris 9th	11	4	0	7
TOTAL	16	9	0	7

The recommendations concerning the evolution of the technical regulation of vehicles require the revision of several UNECE regulations by the ad hoc working group WP.29 (Working Party 29) where France is represented by the specific directorate in charge of vehicles DGEC. If the BEA-TT has not yet received a formal response from the DGEC, it should be noted that a press release issued by the ministers in charge of transport following the report explicitly requests this board to bring the issue to the WP.29 without delay. Thus, at the time of writing this annual report, a specific working group, led by

* HGV: Heavy Goods Vehicle; UNECE:

France, has been established within WP.29 to propose a revision of the regulations concerned by the BEA-TT recommendations.

3.2.4 - General summaries of investigation reports published in 2017

Accident between a cyclist and a truck that took place on 17 August 2015 in Paris 9th at the crossroads between the rue de Bruxelles and rue de Douai

On 17 August 2015 at 08:42, a truck was stopped at rue de Douai (9th district of Paris) at a red traffic light at the crossroads between rue de Douai and rue de Bruxelles. It started up again when the lights turned green and turned right to take the rue de Bruxelles, hit a cyclist on its right front side.

The cyclist, who was cycling in the same direction as the truck and continued straight ahead, fell to the ground on the impact and found himself under the wheels of the truck, which stopped in the middle of the crossroads.

The main cause of this accident was that the cyclist had not been visible to the driver of the truck.

The driver had not noticed the presence of the cyclist before or during turning, either because he did not check his blind spots during his right-turn manoeuvre, or because the mirrors on his truck were poorly adjusted.

The cyclist also had not anticipated the truck's right-hand turn.

Another factor in the accident was the cyclist and the truck's almost simultaneous departure on the green light, causing the cyclist to be hit almost immediately by the truck when it started its right turn.

Accordingly, the BEA-TT makes the following recommendations relating to:

- driver awareness of the risks associated with blind spots;
- improvement of lateral vision from the driving position;
- the layout of the bike advanced stop line at the foot of the traffic lights;
- awareness of cyclists about their vulnerability.

In addition, BEA-TT invites the DGEC, the truck manufacturers and the equipment manufacturers to encourage, promote and develop anti-blind spot systems for heavy goods vehicles, such as active detection systems for truck drivers (like sensors with visual and audible warning signals detecting the presence of vulnerable users) and warning systems for vulnerable users (a type of audible warning signal, for example when the driver of a heavyweight vehicle puts on their right indicator).

For example, an active driver assistance system such as the Blind Spot Information System, which was submitted by Germany in 2017 as a draft UNECE regulation, could fulfil the driver information function for blind spots.

http://www.bea-tt.developpement-durable.gouv.fr/paris-9e-r229.html

Collision (and resulting fire) between a coach and an HGV that occurred on 23 October 2015 on RD 17 road near Puisseguin (33)

On 23 October 2015, at around 07.30, near the town of Puisseguin in the department of Gironde (33), an articulated lorry (consisting of a tractor unit and an empty wood trailer) with two people on board, travelling on the B-Road RD 17 towards the town of Puisseguin, jack-knifed when navigating a right-hand bend and passed into the opposite lane, colliding with a coach carrying 49 people which was travelling in the opposite direction.

A fire broke out immediately after the crash and engulfed both vehicles.

The accident resulted in the deaths of 43 people (41 coach passengers and the two people travelling in the HGV), and caused injuries to 8 others who were able to escape from the coach (the driver and 7 passengers).

The direct cause of the accident was the loss of control of the HGV as it was navigating a tight right bend, causing the vehicle to swerve into the left hand-lane and collide with a coach travelling in the opposite direction.

Consequently, a violent fire broke out immediately after the collision, as the coach was very quickly invaded by toxic black smoke.

Several factors played a role in the heavy death toll of this accident:

- the presence of an additional diesel fuel tank installed on the back of the articulated lorry's driver cab, that was not in accordance with regulations;
- the nature of the materials used for the coach's interior fitting, their fire resistance and the toxicity of the gases emitted by their combustion;
- the difficulty the passengers faced in operating the smoke extraction devices fitted to the coach;
- the difficulty the passengers faced when they tried to use the coach's two access points

and emergency exits.

In light of these elements, the BEA-TT has drawn up five recommendations for the attention of the Ministry for an Ecological and Solidary Transition, regarding:

- installation inspections for additional fuel tanks on vehicles;
- improved fire-resistance of materials used in vehicle construction, and the introduction of new industrial standards regarding the toxicity of gases released by the combustion of these materials;
- improvements to the opening mechanisms for smoke extraction devices, in order to make them easier to use;
- the addition of emergency doors at the rear end of such vehicles, or failing this, extending the provisions of Decree no. 2015-1170, issued on 22 September 2015 (pertaining to accessibility in vehicles designated for use in providing inter-urban public transport services) to all buses and coaches, and/or improving industry standards regarding the opening mechanisms of emergency exit windows in order to make them instantly manoeuvrable and easier to use in the event of an emergency evacuation of the vehicle;
- reinforcement of existing legislation regarding “emergency lighting systems” for coaches, so that safety equipment for emergency evacuations (and emergency lighting used to indicate vehicle evacuation routes) remain visible, especially in cases where the vehicle’s interior has become filled with opaque smoke.

Furthermore, without making a formal recommendation, the BEA-TT invites:

- *the roadways authority to consider the advisability of limiting the maximum speed to 50 km/h on this bend;*
- *trade union bodies representing HGV drivers to make their members aware of the importance of respecting approved technical rules when installing fuel tanks;*
- *the FNTV to supplement its 2016 coach passenger safety awareness brochure, which outlines the safety rules to be complied with on a coach and the instructions for evacuation in case of emergency, giving a description of the procedure to be followed in the event of a fire in the coach’s passenger compartment.*

http://www.bea-tt.developpement-durable.gouv.fr/puisseguin-r235.html

3.3 - River transport

3.3.1 - Investigation concluded in 2017

One investigation concerning a river transport accident was completed in 2017.

Date	Nature and location of the accident	Number of fatalities
06/06/15	Collision of the VIKING HERMOD passenger boat with the La Voulte-sur-Rhône SNCF bridge	0

This accident is the result of damage whose effects on manoeuvrability were poorly assessed and the information to the authorities was not sent in time.

3.3.2 - The issued recommendation

A recommendation recalling the procedure in force was sent to the company operating the boat. They did not respond.

3.3.3 - General summary of the investigation report published in 2017

Collision of the VIKING HERMOD passenger boat with the La Voulte-sur-Rhône SNCF bridge on 6 June 2015

The VIKING HERMOD passenger boat cruises the Rhône between Mâcon and Avignon. Starting in Lyon, it sailed down the river on 6 June 2015 when it was caught in a violent storm along with heavy rain greatly reducing visibility.

Having already crossed the Beauchastel lock, the boat could no longer stop and had to continue on its route.

It sailed up to the La Voulte-sur-Rhône bridge, located at PK 128.6, to cross the downstream boats pass. It was in these conditions that it was pushed onto the bridge pier, which is to the left of its path, by the strong wind of the storm, without being able to control its position, neither by sight, nor by radar. When the captain was finally able to see the bridge coming up, the boat could no longer avoid the collision and, at around 22.30, hit the bridge pier with the superstructures located port side.

The investigations carried out make it possible to establish that the direct cause of the accident is the poor approach of the Voulte-sur-Rhône SNCF bridge by the VIKING HERMOD passenger boat, which came in too much to the left of the downstream boat pass. This situation is directly linked to the storm that was raging at the time of the manoeuvre. The heavy rains completely eliminated visibility and saturated the radar image with echoes. Therefore, there was no way to detect markers marking the bridge piers. At the same time, the strong wind pushed the boat against the deck pile to the left of the passing boats.

When the captain saw the bridge pier at the last moment on the front of the boat, they could not completely avoid it, especially since the manoeuvring capacity of the boat was reduced by the damage to two of the four rear thrusters.

Three factors contributed to this accident:

- the lack of radar detection of the beacons positioned upstream of the bridge piers;
- the manoeuvrability of the VIKING HERMOD, which was restricted by the failure of two of the four rear azimuth thrusters to propel and manoeuvre the boat;
- the captain's workload, whose vigilance and his decision-making abilities had been depleted due to fatigue, which is itself related to the high number of working hours resulting from the grounding of the VIKING HERMOD passenger boat in Mâcon and subsequent repairs.

In light of these considerations, the BEA-TT makes a recommendation to the Viking River Cruises Company regarding the need to report to the authorities, in accordance with police rules, any damage that may hinder the manoeuvrability of the boats or the safety of navigation.

Beyond this formal recommendation, the BEA-TT draws the attention of Viking River Cruises to the need to encourage crews to respect maximum working hour limits provided by the regulations and invites the waterway manager to study the installation of radar reflectors.

http://www.bea-tt.developpement-durable.gouv.fr/viking-hermod-la-voulte-sur-rhone-r226.html

3.4 - Guided transport

3.4.1 - Investigations concluded in 2017

Two investigations of accidents that occurred in the operation of guided transport were concluded in 2017. The table below sets out the nature, locations and dates of these accidents.

Date	Nature and location of the accident	Number of fatalities
21/12/13	Collision between a tramway and a car in Saint-Denis (93)	1
11.04.2014	Derailment and dislocation of a line T1 tramway train in Valenciennes (59)	0

The first accident highlights the importance of the development of intersections between the tramway infrastructure and the road network, where tram traffic and road traffic interact. The layout must be of quality, with appropriate signage and free of dangerous obstacles. Feedback from accidents must be effectively gathered to improve the layout of accident-free intersections.

The second accident highlights the peculiarity of operating a centralised tram control station. Its railway-inspired design requires the application of very strict rules in case of disturbance to prevent dangerous situations from occurring.

3.4.2 - Recommendations issued

On conclusion of these reports, BEA-TT made 6 separate recommendations.

Nature of the recommendations

Out of these 6 recommendations:

- 1 concerned improvement to infrastructures;
- 2 relate to the improvement of instructions for operators;
- 2 concern the improvement of the operators' processes, internally or in cooperation with external actors;
- 1 deal with regulation and its support for effective implementation.

Recipients

Three of the recommendations mentioned above were sent, each with the same wording, to several recipients, so that the total number of recommendations received by recipients in the relevant investigations was 21, comprising:

- 11 to mobility organising authorities
- 3 to operators;
- 2 to STRMTG;
- 3 to directorate generals of ministries (DGITM, DGCL and DSR);
- 2 to professional mobility organisations (GART and UTP).

3.4.3 - Follow-up action planned by recipients

The table below shows the follow-up action that the recipients of the above recommendations plan to carry out.

Investigation	Recommendations			
	Number	Accepted	Not accepted	No reply
Saint-Denis	19	10	2	7
Valenciennes	2	2	0	0
TOTAL	21	12	2	7

3.4.4 - Monitoring the implementation of the recommendations

On the basis of monitoring carried out by the Ski Lift and Guided Transport Technical Department (STRMTG), the state of progress of the operational implementation of the recommendations made between 2012 and 2016 following guided transport accidents is as follows:

Year of publication of the report	Number of recommendations addressed			
	total	closed		In progress
		completed	Not accepted	
2012	18	9	3	6
2015	3	0	0	3
2016	7	2	0	5
Total 2012-2016	28	11	3	14

3.4.5 - General summaries of investigation reports published in 2017

Collision between a tramway and a car on 21 December 2013 in Saint-Denis (93)

On Saturday 21 December 2013, at 19:50, a car traveling on the road from La Courneuve to Saint-Denis (93) crossed a traffic light at the intersection with rue Voltaire, turned left and went onto the platform of the Ile-de-France tramway T1 line.

A train going in the same direction and whose signal light also authorised it to cross the intersection, hit it and pushed it against a pole supporting an overhead contact line.

There were 5 victims in this accident. In the car, a child was fatally injured and the three other passengers, two adults and a child, were seriously wounded. The tram driver suffered minor injuries.

The direct cause of the accident was the car’s entry onto the tramway platform when a tram was approaching. Two factors contributed to the collision:

- on the one hand, the signs and layout of the intersection that did not allow motorists to quickly and unequivocally understand that a left-hand turn was not permitted there. This prohibition could only be inferred from the presence of a single lane mark painted on the ground, indicating only the straight on direction;
- on the other hand, the poor use of the operator's feedback on tramway accidents by the actors concerned, which did not make it possible to remedy this insufficient road signalling, even though it had been initially identified in 2006 following a similar injury accident and played a role in several other material accidents.

Finally, the consequences of this accident were aggravated by the presence, in the immediate vicinity of the intersection, of a support pole for the overhead contact line (LAC), against which the car was crushed.

This analysis led BEA-TT to make four recommendations and four calls for action on the following matters:

- the layout and signage of the intersection of the route de la Courneuve with rue Voltaire;
- the prevention of the risks of the outcome of collisions being worsened by fixed obstacles;
- feedback from tram accidents, and the participation of road managers in it.

http://www.bea-tt.developpement-durable.gouv.fr/saint-denis-r206.html

Derailment and dislocation of a T1 tramway train on the Valenciennes (59) line on 11 April 2014

On Friday 11 April 2014 at 04:40, the 417 train left the Saint-Waast storage depot and entered the T1 tram line of the Valenciennes network. Only the first two bogies passed the switch to engage on track 1 properly. The third bogie continued its course on track 2 following a double track.

The train accelerated to 24km/h and continued sideways for 70 metres. It then collided with an overhead contact line support pillar located between the tracks. The train broke in two due to the impact and came to a stop.

The accident caused no injuries, only the driver was present. The accident caused extensive damage to the rolling stock and infrastructure.

The direct and immediate cause of this accident was the change of position of a switchgear between the passage of the second and the third bogie of the train when leaving the depot.

Several factors contributed to this accident:

- a self-powered buggy going on the tracks the night before the accident, whose movement was not compatible with a normal operation of the signalling automation and which led to the track use being represented falsely in the command station;
- the existence of a programming error in the operating software of the control station since its installation, which made it impossible to correct this situation and which led to a degraded use;
- the organisation of traffic in degraded mode, with closed signal crossings and manual switching operations, without the application of strict measures to guarantee safety, such as the inhibition of automation.

These causes stem from the incorrect use of signalling automation by the operators, itself caused by a lack of precise instructions detailing the operating procedures to be implemented, and by the management's lack of rigour in observing and dealing with security faults at the centralised control station.

The analysis of the causes led BEA-TT to make two recommendations addressed to the operator and related to the improvement of the operating instructions.

These recommendations are supplemented by an invitation to the STRMTG to finalise the guide on "Safety of tramway manoeuvring areas" to encourage designers, builders and operators to strengthen the safety of manoeuvring areas.

http://www.bea-tt.developpement-durable.gouv.fr/valenciennes-r215.html

3.5 - Ski lifts

3.5.1 - Investigations concluded in 2017

Two investigations of accidents which occurred in the operation of ski lifts were concluded in 2017. The table below sets out the nature, locations and dates of these accidents.

Date	Nature and location of the accident	Number of fatalities
4.04.2016	Fall of an empty chair from the Granges chairlift in Menuires (73)	0
12.01.2017	Derailment of the Télémétro in La Plagne (73)	0

These two accidents illustrated the fact that under difficult climatic conditions (strong wind in one case, heavy snow with frost in the other case), the operation of the ski lifts differs from the normal operating conditions. Keeping them in operation must be carefully supervised. The rules to be applied by operators must be realistic and unambiguous. In addition, the installations should be improved in order to reduce the risks.

3.5.2 - Recommendations issued

On conclusion of these reports, BEA-TT made 8 separate recommendations.

Nature of the recommendations

Out of these 8 recommendations:

- 3 relate to guidelines given to operators, and the strengthening of their training;
- 2 relate to the improvement of installations to minimise risks;
- 1 relates to the modification of the regulations;
- 1 relates to the improvement of a manufacturer's technical documentation;
- 1 relates to the verification of the good coverage of a particular risk (icing of the suspension cable support) across all facilities sensitive to this risk.

Recipients

The 8 recommendations were sent as follows:

- 3 to STRMTG;
- 4 to an operator;
- 1 to a manufacturer;

3.5.3 - Follow-up action planned by the recipients

The table below shows the follow-up action that the recipients of the above recommendations plan to carry out.

Investigation	Recommendations			
	Number	Accepted	Not accepted	No response
Les Menuires	5	5	0	0
La Plagne	3	3	0	0
TOTAL	8	8	0	0

3.5.4 - *Monitoring the implementation of the recommendations*

On the basis of monitoring carried out by the Ski Lift and Guided Transport Technical Department (STRMTG), the state of progress of operational implementation of the recommendations made between 2012 and 2016 following accidents affecting the operation of ski lifts is as follows:

Year of publication of the report	**Number of recommendations addressed**			
	Total	Closed		In progress
		Completed	Not accepted	
2012	5	5	0	0
2013	3	0	0	3
2014	10	3	1	6
2015	2	1	0	1
2016	0	0	0	0
Total 2012-2016	20	9	1	10

3.5.5 - General summaries of survey reports published in 2017

Fall of an empty chair from the Granges chairlift on 4 April 2016 in Menuires (73)

The event relates to the *Granges* chairlift located on the skiable part of Menuires.

At 12:21 on 4 April 2016, in overcast and windy conditions in which the anemometers of the Granges chairlift triggered several “strong wind” alerts during the morning, an empty chair swinging in a gust of wind caught the walkway on pylon P10 and fell to the ground.

The chairlift stopped after the cable derailment detector on the pylon was triggered.

After ascertaining that the cable was not derailed and that damage to the cable and pylon balance was limited, a visual surveillance was set up and the lift was restarted at a reduced speed to transport the passengers who were in the other seats to the station. The immobilisation then the recovery of the customers required a total of about one hour.

Operation of the facility was subsequently halted pending the conclusion of the immediate investigations and checks.

It resumed on 9 April up until the end of the season with the agreement of the STRMTG, the State Technical Service in charge of the safety control of ski lifts, with restrictions in relation to wind speed and subject to weekly checks of the condition of the cable.

The investigation showed that the fall of seat no. 13 was due to the impact and the seat becoming attached to the end of the support beam of the steps of pylon P10. The impact was due to the shakiness of the seat under the effect of a strong wind and its protective bubble inadvertently opening. The attachment was due to the absence of an anti-engagement guide at the end of the pylon beam.

This analysis led BEA-TT to make four recommendations on the following matters:

- the rules relating to the use of the installation when it is very windy;
- the information on the strength and direction of the wind provided to the driver;
- maintenance of the bubble locking system;
- the risk linked to the seats wobbling due to the wind being acknowledged in the gauge rules and standards.

http://www.bea-tt.developpement-durable.gouv.fr/les-menuires-r247.html

Telemétro derailment
which occurred on 12 January 2017
in La Plagne (73)

The accident concerns the "Télémétro" cable car which connects the two resort villages of Plagne Centre and Aime 2000 on the skiable area of la Plagne.

On Thursday 12 January 2017 at 21:04, it was snowing heavily. While the cabin descending from the cable car went to the right of the pylon P2, the carrier cable escaped from its support at the head of the pylon. It became stuck in the traction cable's support wheels, located underneath. The cab derailed and stayed balanced on the cable. The installation stopped automatically by triggering an overlapping safety alarm for the traction and carrier cables.

The driver didn't realise that the cab and the cable had derailed. He tried to restart several times to take the two cabins back to the station, and shunted all of the installation's security measures to do so. It was not until more than an hour later, following the arrival of the on-call electrician, and after further unsuccessful attempts at movement, that the line was recognised and that the derailment was identified.

They decided to evacuate the five passengers present in the cabs. This evacuation was completed at 0:55. The passengers suffered no injuries.

The Télémétro was then stopped for five weeks to repair the damaged parts of the cab and the pylon. It was up and running again on the 21 February 2017. The operator then took several measures to reinforce safety concerning the monitoring and the operating conditions of the installation. They also initiated a call for projects to modify the design of the cable car.

The immediate cause of the derailment is the attachment of a part of the car carriage to a part of the pylon P2. The movement in these two parts becoming attached laterally drove the carrier cable from its support.

The original cause of the attachment of the two parts was the lateral offset of the suspension cable at the entrance of the pylon, made possible by the presence of ice in the bearing housing of the cable, as well as by the geometric misalignment of the support casing.

Several factors contributed to this accident:

- design of the vehicle and pylon presenting a risk of derailment in case of ice accumulation;
- the fact that on that evening, the de-icing instructions for the suspension cable support at the top of the pylon hadn't been applied to avoid this risk;
- the slightly angled positioning of the cable supports on the pylon with respect to the axis of the cable car.

Immediately after the derailment, the driver made several attempts to restart without any precaution, shunting all the security systems, thus running the risk of doing more damage, the consequences of which could have been serious. He didn't identify the causes of the emergency stop before restarting the installation.

The organisational and human factors explaining this risky behaviour relate to the lack of training, already observed on other cable cars, and the lack of instructions detailing the checks to be performed for rigorous safety management of this type of incident.

The BEA-TT issued two recommendations relating to the derailing. They concerned:

- handling the Telemétro derailment risk by redesigning the cable car on the cabins and pylons;
- checking how the derailment risk for all cableways with similar design to Télémétro is handled, by ensuring the sturdiness of the suspension cable support safety on the pylon heads.

The BEA-TT issued a recommendation and an invitation relating to the organisational and human factors regarding the post-derailment operations: They relate to:

- the provision of a formal safety instruction to Télémétro operators specifying the checks to be made before and after shunting a security system;
- carrying out an assessment of the effects produced by the new regulations applicable on 1 October 2017, on the training of drivers and, in the event of a deficit, the evolution towards the requirement of a driving clearance for cable car drivers.

http://www.bea-tt.developpement-durable.gouv.fr/la-plagne-r258.html

4 - Summary of the recommendations

4.1 - Global overview

Fourteen investigations were concluded in 2017. The 14 accidents to which they refer cost the lives of 63 people.

For four of these cases, the investigations carried out quickly made it possible on the one hand to determine the causes and circumstances of these accidents and on the other hand to note the absence of factors likely to lead to preventive recommendations. As a result, the BEA-TT took the decision to close them in the form of summary sheets summarising the conclusions of the investigations.

The accidents involved were as follows:

- the fall of a "2300" chairlift passenger on 11 March 2014 in the Peisey-Vallandry skiable area (73);
- the fall of a "La Logère" chairlift seat on 22 March 2015 at the Crest-Voland-Cohennoz station (73);
- Collision between a school bus and a heavy goods vehicle on 14 November 2016 on departmental road 25 in Bavincourt (25)
- Pile-up on 20 December 2016 on departmental road 160 in Sainte-Flaive-des-Loups (85).

The decision to close the investigations. The overview forms are published on the BEA-TT website.

4.2 - Nature of the recommendations

As a result of these 10 reports, BEA-TT made 38 distinct recommendations:

Out of these 38 recommendations,

9 relate to the road sector:

- 6 relate to vehicle layout regulations;
- 2 relate to the awareness of vehicle drivers of the risks incurred because of the lack of visibility;
- 1 relates to the development of infrastructure around self-service bicycle stations.

1 relates to the river sector

- A recommendation recalling the procedure in force was sent to the company operating the boat.

14 relate to the railway sector:

- 3 relate to the improvement of the methods used during the works or tests;
- 3 concern the development of standards or procedures;
- 2 aim at improving the training of operators;
- 2 relate to the performance of rolling stock;
- 2 relate to the evolution of railway infrastructure;
- 1 aims at improving feedback for better security;
- 1 focuses on strengthening online recording to help understand the accidents.

8 for the ski liftsector:

- 3 relate to guidelines given to operators, and the strengthening of their training;
- 2 relate to the improvement of installations to minimise risks;
- 1 relates to the modification of the regulations;
- 1 relates to the improvement of a manufacturer’s technical documentation;

- 1 relates to the verification of the good coverage of a particular risk (icing of the suspension cable support) across all facilities sensitive to this risk.

6 relates to guided transport

- 1 concerned improvement to infrastructures;
- 2 relate to the improvement of instructions for operators;
- 2 concern the improvement of the operators' processes, internally or in cooperation with external actors;
- 1 deal with regulation and its support for effective implementation.

Recipients

Seven of the recommendations mentioned above were sent with the same wording to several recipients, so the total number of recommendations received by recipients was 63, i.e. 17 for rail transport, 16 for road transport, 1 for river transport, 21 for guided transport and 8 for ski lifts.

4.3 - Follow-up action planned by the recipients

Article R. 1621-9 of the Transport Code stipulates that the recipients of recommendations must inform the director of BEA-TT within 90 days of the action they intend to take in response and, if applicable, the time required to implement it. Their replies are published, as are the recommendations themselves.

Out of the 63 recommendations issued in 2017:

- 52 were accepted and their implementation confirmed, in some cases setting a deadline;
- Responses to 11 of them have still not been received from the recipients involved.
- 5 recommendations for which there were no replies from the recipients but a ministerial press release was published

Note that BEA-TT is not authorised to supervise the operational action actually taken in response to the recommendations issued.

By law or de facto, an external authority takes charge of monitoring this implementation beyond simply the collection of information on the intentions of recipients by BEA-TT.

With regard to the main rail transport players, this monitoring is carried out by the National Rail Safety Authority (EPSF)* in accordance with EU directive 2016/798 of 11 May 2016 and national transfer texts.

DGITM*, the central administrative division of the ministry of transport or the STRMTG* (Ski Lift and Guided Transport Technical Department), a service that is part of the DGITM, monitors the implementation of the recommendations by their other recipients.

* Term provided in the glossary

APPENDICES

Appendix 1: EPSF table showing monitoring of the implementation of rail transport recommendations issued by BEA-TT

Appendix 2: STRMTG table showing monitoring of the implementation of guided transport recommendations issued by BEA-TT

Appendix 3: STRMTG table showing monitoring of the implementation of ski lifts recommendations issued by BEA-TT

Appendix 4: BEA-TT organisational chart and institutional texts

Appendix 5: Glossary

Appendix 1: EPSF (National Rail Safety Authority) table showing monitoring of the implementation of rail transport recommendations issued by BEA-TT

Recommendations issued in 2006

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
12/2006	Collision between a regional express train and a heavy goods vehicle on a level crossing at Saint-Laurent-Blangy (62) on 09/06/2005	R1	To continue studying the solutions (an underpass on location or a new route) to eliminate this level crossing in order to reach a decision and implementation as soon as possible.	SNCF Réseau General Council 62	The agreement for the preliminary study is being read and validated within SNCF Réseau. After validation, it will be signed by the departmental council and DREAL.	O
11/2006	Corail train derailment at Saint-Flour (15) on 25/02/2006	R4	To draft a program to bring lines open to passenger traffic equipped with DC rails up to standard. In the longer term, to organise the gradual replacement of DC rails with Vignole rails in view of the aging of this equipment, its increasing maintenance costs and the high risk of derailing in the event of rail failure.	SNCF Réseau	The planned reduction target of 411 km by 2016 has been achieved. A technical note is being written to specify the precautionary measures taken or to be taken on double-head rail areas for which replacement is not planned.	O

* C= Closed; O = Open

Recommendations issued in 2007

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code
11/2007	Passenger accident in the station at Chaville-Rive-Droite (92) on 10/11/2006	R1	For rolling stock on which a major workshop maintenance operation is required, modifications should be designed to allow the doors to be opened manually after a fire alarm system is activated, at a lower speed threshold than the lowest detectable speed; a program should be drafted to implement these modifications.	SNCF Mobilités	The progress rate for the changes are as follows: - Z2N: 78 % of the Z2N fleet has been changed - Z20500: line D implementation rate = 88%, line P = 100%, line C = 96.5%. - Z20500: line D implementation rate = 78.6% - Z5600 and Z8800: line D implementation rate = 45.8%, line U = 73.9%, line C = 62.9% for the Z5600 and 93.4% for the Z8800 - Z20500 hybrid: line D implementation rate = 87.5% - Z 6400: no changes planned.	O

Recommendations issued in 2008

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code
12/2008	Train derailment at Culoz (01) on 24/07/2006	R2	For future track works machinery with complex architecture in accordance with IN 1418, the suitability of vehicles with new technology which, in particular, measure Y and Q wheel/rail interaction forces for passing twisted tracks should be checked and the procedure prescribed by form UIC 518 should be applied for the test on the line. In the case of a train with an architecture similar to that of the P21/95, at least the working group axle should be subjected to such measurements.	SNCF Réseau	Action closed	O

Recommendations issued in 2009

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code
12/2009	Collision with a group of people at the Stade de France at Saint-Denis (93)	R5	The policy for locating signs prohibiting access to railway areas and warning of the dangers related to doors and gates giving access to railway platforms should be reviewed. Procedures for implementing this policy should be established.	SNCF Réseau	A major update to the policy document for collision risks with unauthorised persons on the main line is underway. This policy will be extended to all breaches on the RFN lines, and will include a risk analysis approach.	O

Recommendations issued in 2010

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code
02/2010	Collision between a coach and a regional express train at Allinges (74) on 02/06/2008	R2	The decree of 18 March 1991 (Article 10) should be supplemented, specifying that the delay in closing a level crossing must allow all authorised heavy goods vehicles entering at the moment when an approaching train warning is issued to clear the entry barrier to traffic in the opposite direction before it closes. This condition should be checked in consultation with the road infrastructure managing agency to determine the time required for authorised vehicles to cross. If taking this into account leads to excessive delays with regard to other considerations, leading to limiting the delay in the warning (e.g. the risk of careless users zigzagging through half barriers), measures should be taken to prohibit road vehicles from passing if they cannot cross the level crossing within the allotted time.	DGITM	Significant work was undertaken in 2016 to manage to publish the decree of 19 April 2017, amending the decree of 18 March 1991 relating to the classification, regulation and equipment of level crossings. This publication allowed for the closure of this recommendation on 19 April 2017.	O
09/2010	Collision between a coach and a regional express train at LC no. 4 in Nevers (58) on 03/02/2009	R3	Evaluate and study the LC no. 4 fire control system (as well as LC no. 5) to search for simple optimisation measures (duration of fire cycles, possible coordination of upstream and downstream lights, activation delay for upstream fire after detection, effectiveness of the detection loop, etc.) to reduce the risk of an immobilised vehicle at the tail end of the queue downstream of the crossing encroaching on the railway.	Nevers municipality	Action in progress	O

Recommendations issued in 2010 – continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
12/2010	Derailment of two hazardous goods wagons at the station in Orthez (64) on 24/11/2009	R2	Arrange for entities in charge of maintenance to check the relevance of the maintenance regulations on the connections between the car bodies and bogies of long wheelbase tanker wagons and strengthen the traceability prescriptions for works on these components.	AFWP	Action closed	C
		R3	Arrange for the entities in charge of maintenance to amend and supplement the criteria related to the play on the side friction blocks of long wheelbase rigid wagons to bring them sufficiently into compliance with track standards to ensure that the wagons are suitable for passing along twisted tracks.	AFWP	Action closed	C
12/2010	Collision between a train and the load of an oncoming train in the Livernant tunnel (16) on 20/05/2009	R5	Examine the procedures for enabling train drivers to assess whether the dimensions of an oncoming train foul the gauge when they hear an unusual impact noise on passing a goods train at night or in poor visibility by adapting regulatory text IN 1514-S2C or by means of specialised railway company documents.	EPSF	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2011

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
01/2011	Goods train derailment in the station at Neufchâteau (88) on 22/05/2010	R2	Send a recommendation to the holders to strengthen and improve the reliability of the wheel crack detector frames on their wagons jointly with their entities in charge of maintenance or their maintenance engineering service providers.	AFWP	Action closed	C
08/2011	Goods train derailment in the station at Bully-Grenay (62) on 29/07/2010	R2	Contribute on a European level to the establishment and implementation of an obligatory certification and monitoring system for workshops working on brake valves and, more generally, on the most critical safety components.	DGITM	Action closed	C
		R3	Jointly with the main European networks, compare the consistency, density and quality of full monitoring and detection systems for moving trains (not including high-speed LGV lines) and find innovative systems in their project or trial phase. Share the results of the above with the main stakeholders involved in national rail network safety and learn lessons to benefit the infrastructure and equipment on this network.	SNCF Réseau	Action closed	C
10/2011	Collision between a regional express train and a heavy goods vehicle on an unmanned level crossing at Gimont (32) on 27/09/2010	R2	Pending the removal of the level crossing no. 76 or the installation of a light and sound signalling on this LC, heavy vehicles should opt for access to the Julias hamlet via the route crossing the railway by a lower passage.	Gimont municipality	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2012

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
01/2012	Goods train derailment in the station at Neufchâteau (88) on 22/05/2010	R1	Address the European Railway Agency (directly in the case of EPSF, through the Joint Sector Group [JSG] in the case of SNCF and through the European Railway Wheels and Wheel Sets Association [ERWA] in the case of Valdunes) in order to promote a set of studies and tests to assess the actual forces exerted on the running gear of tank wagons on the line and in marshalling yards and the interactions between these forces with a view to taking them into account in wheel design standards.	EPSF	Action closed	C
				Valdunes	Action closed	
				BNF	Action closed	
		R6	Address the GCU office to arrange for the search for wheel web fractures during technical transfer inspections and on post-repair checks to feature more explicitly in annexes 9 and 10 of the general contract of use.	NACCO	Action closed	C
		R6	Address the GCU office to arrange for the search for wheel web fractures during technical transfer inspections and on post-repair checks to feature more explicitly in annexes 9 and 10 of the general contract of use.	NACCO	Action closed	C

* C= Closed; O = Open

Recommendations issued in 2012 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
05/2012	Collision between a regional express train and a heavy goods vehicle in Saint-Médard-sur-Ille on 12/10/2011	R2	1 - Arrange for an assessment of the conditions for implementing the level crossing safety improvement policy, particularly with regard to: - procedures for listing level crossings referred to as "causing concern" in terms of the relevance of the classification criteria and considering the safety diagnoses prescribed by the circular of the transport minister dated July 2008 and approval of this list; - clarification of the procedures and actions involved in entering a level crossing on this list, particularly with regard to programming design studies and works to develop or eliminate them; - putting this policy into operation in terms of assessing and possibly redirecting actions already implemented or pending implementation; - role of the national body for coordinating the policy for the elimination and development of level crossings in the implementation of this policy. 2 - Introducing the adjustments ensuing from this assessment.	DGITM	The programme for safeguarding the LCs was created	O
06/2012	Collision between a goods train and a lorry carrying an abnormal load of metal girders stopped by LC 222 at Balbigny (42) on 25/01/2011	R3	Arrange for the French rail network (RFF) and SNCF to draft information on the special hazards involved when abnormal loads pass through level crossings and disseminate it among professional road transport organisations, in particular drawing attention to the precautions to be taken to avoid immobilisation on level crossings and situations for which the rail infrastructure managing agent must be asked to provide protection.	DGITM	A working group initiated by the Traffic Safety and Traffic Department is underway and will lead to a change in the training of exceptional transport drivers.	O

* C= Closed; O = Open

Recommendations issued in 2012 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
11/2012	Catch-up collision of two goods trains at Maillé (37) on 01/02/2012	R1	Ensure that safety communications between the regulators and signalmen on their service landline telephones are recorded and traceable. *In addition, BEA-TT calls on rail operators on the national rail network to remind their drivers of the safety requirements attached to travelling at restricted speed, particularly in terms of vigilance and controlling the speed of their train, so as to be able to stop before any signal or obstacle.*	SNCF Réseau	The roll-out programme is underway, it can be broken down into three phases: - In the short term, deployment of telecommunication recorders at 100 sites (completed); - In the medium term, deployment on the GSM-R recorder network, target date mid-2017; - In the long term, deployment of new generation railway telephony (TFNG) will include a recording functionality.	O

* C= Closed; O = Open

Recommendations issued in 2013

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
06/2013	Collision between a regional express train and an automobile at Le Breuil (69) on 04/12/2011	R1	Establish and implement the national unmanned level crossing safety programme as soon as possible at Croix de Saint-André.	DGITM	Action in progress	O
		R2	As part of the national level crossing safety improvement policy, request prefects to call on local authorities to take appropriate steps to ensure that access to the unmanned level crossings at Croix de Saint-André that only serve a few residents is quickly and strictly restricted to these residents only.	DGITM	Action closed	O
		R3	Take the required steps to eliminate level crossing No. 65 on the Lozanne railway line at Paray-le-Monial and, pending this, restrict access to it strictly to residents only by all appropriate means. *Furthermore, without issuing formal recommendations, the BEA-TT:* *- called on railway companies to ensure that their drivers comply with "S" signs and, more generally, the regulations for the use of the audible warning;* *- drew the attention of the French Rail Network to the fact that the surroundings of certain unmanned level crossings at Croix de Saint-André make it difficult to hear the warning signals of trains, increasing the risks run by road users, and called on it to take account of this in the level crossing safety programme.*	SNCF Réseau Rhône Prefecture Breuil Municipality	The first phase of work was started in Autumn 2016. The works are planned to come to an end in the first quarter of 2018. The deadline is subject to the administrative terms of land acquisitions.	O

* C= Closed; O = Open

Recommendations issued in 2013 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
06/2013	Collision between a rail motor vehicle and an insulator at Sevran (93) 01/02/2012	R2	List the characteristics of front windscreens and windscreen heaters fitted on rolling stock and the regulations for the use of these windscreen heaters. For rolling stock equipped with front windscreens that do not comply with EN 15152 or NF F 15-818 or an equivalent national standard, examine the possibility and relevance of improving protection against the entry of projectiles into driving cabs during cold weather, for example by specifying the rules for the use of windscreen heaters or by planning to replace the glass with components with improved impact strength at low temperatures.	All EF	Action in progress	O
		R3	Ensure that the changes in EN 15152 on rolling stock windscreens take account of the variability of the glass with temperature and impact resistance and ensure that driver protection is maintained or even improved throughout the temperature range currently encountered on the national rail network and particularly at negative temperatures. *In addition to this last recommendation, BEA-TT also called on rail companies other than SNCF to endeavour to take similar steps with regard to the national or international standardisation authorities in which they take part.* *In addition, BEA-TT called on AGC glass and Saint-Gobain to acquire actual knowledge of the impact resistance of the glass used for rolling stock windscreens through tests, studies or any other means, throughout the entire temperature range currently encountered on the national rail network, including in hot weather with the windscreen heater in operation, and to share this knowledge in the course of the work to revise EN 15152.*	BNF	Action in progress	O
				SNCF Mobilités	Action in progress	

* C= Closed; O = Open

Recommendations issued in 2013 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
07/2013	Collision between a train and a works machine at Lachapelle-Auzac (46) on 04/07/2012	R1	As part of the feedback process carried out on the application of works insurance processes and in order to avoid the appearance of incorrect practices, examine the conditions for safely facilitating the use of the equipment guarantee process during unforeseen works with a minor impact on rail traffic.	SNCF Réseau	Action closed	C
		R3	Ensure that all communications related to operations carried out from signalmen's service telephones are recorded. *In addition, BEA-TT calls on SNCF to carry out a feedback process on the use of new LOR'AXE catenary maintenance engines and on the conditions for training their drivers.*	SNCF Réseau	The roll-out programme is underway, it can be broken down into three phases: - In the short term, deployment of telecommunication recorders at 100 sites (completed); - In the medium term, deployment on the GSM-R recorder network, target date mid-2017; - In the long term, deployment of new generation railway telephony (TFNG) will include a recording functionality.	O

* C= Closed; O = Open

Recommendations issued in 2013 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
08/2013	Derailment of a passenger train at Mercuès (46) on 22/05/2012	R1	Establish and implement procedures and methods for monitoring combined works to ensure that they are comprehensively supervised, particularly when they include works on sensitive land.	SNCF Réseau	SNCF Réseau has updated the IN below, a validation phase of these documents is in progress: - IN 00256 "Earthworks, drainages and platforms monitoring"; - IN 01253 "Monitoring of structures and related constructions"; - IN 02088 "Technical requirements for the monitoring and maintenance of coated walls and structural devices."	O
		R2	In acquiring familiarity with the surroundings of the works and establishing the procedures for monitoring them, data contained in the different information and documents and prevention documents related to major natural hazards produced by public authorities (departmental documentation of major hazards, local authority information documents on major hazards, natural risk prevention plans and local contingency plans) should always be considered.	SNCF Réseau	Action in progress	O
		R3	Improve simple real-time rail traffic warning systems that can be activated quickly, drawing lessons from national or foreign road and rail projects, pending permanent measures, for dangerous disorder affecting works.	SNCF Réseau	The first laser scanner warning system was abandoned. The fibre optic-based tool has been being tested since 2015. The results were postponed to the end of 2017.	O

* C= Closed; O = Open

Recommendations issued in 2014

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
01/2014	Inter-city train derailment at Bretigny-sur-Orge (91) on 12/07/2013 (progress report)	R1	Overall improvement in the level of knowledge of the bolted assemblies of switch points and crossings by working on different factors, in particular: • technical specifications and the quality of the components; • bolt tightening systems; • compliance with the instructions for bolt tightening and, more generally, with the specifications and industry standards during assembly and maintenance of these assemblies.	SNCF Réseau	All of the short-term actions have been carried out. To close this action, the publication of the NLD (new directive letter) in connection with the maintenance instruction must include the systematic renewal of the bolts during category B maintenance activities. For the medium term, a specific technical update must be undertaken in order to present the progress of modelling work on a new bolted assembly model, the results of which suggest an overall improvement in terms of the criteria used in the framework of the study.	O
		R3	Identify switch points and crossings or groups thereof with features that require enhanced maintenance or premature regeneration in comparison with the general prescriptions. Provide systems to ensure that these special features are taken into account in a reliable and auditable manner in the general organisation of maintenance works or that of the establishments.	SNCF Réseau	The process and organisation for defining "fast moving devices" is in place. Roll-out across the country has been partially completed.	O
04/2014	Collision between a regional express train and a mobile crane in Marseille (13) on 13/04/2013	R1	Make it impossible to cross the no. 1 Miramas railway line level crossing in Marseille by the Côte Bleue for heavy vehicles coming from rue Albert Cohen with characteristics that do not allow them to circulate easily downstream from the railway right-of-way. Indicate this ban at the crossroads of Chemin du Passet with rue Albert Cohen.	Bouches-du-Rhône prefecture City of Marseille	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2014 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
06/2014	Collision between a regional express train, a minibus and an automobile at Amilly (28) on 27/11/2012	R1	On level crossings where the warning zone is separated from the short zone (approach zone installation), improve the safety of the short zone warning re-set function either by technically modifying the resetting circuit or by changing the rules for maintaining the relevant electrical joints.	SNCF Réseau	Action closed	C
		R2	Amend specification SAM S 004 to ensure that assessment of the suitability of thermal engines equipped with scrubbers coupled with the air brake for shunting takes account of the fact that during their service life these engines will inevitably travel considerable distances without braking.	EPSF	Action closed	C
		R3	Implement a feedback process focusing on deshunting involving thermal locomotives on deadheading runs. Check whether deshunting occurs more frequently than average on series equipped with scrubbers coupled with the brakes, only taking account of deadheading runs. If applicable, establish the measures to be taken.	EPSF	Action closed	C
10/2014	Derailment of a regional express train at Lyon - Guillotière (69) on 26/06/2013	R1	Include the systematic verification that the paintwork process of the axles is ensured in the long-term whenever type 984 axles are concerned when allocating axle repair and workshop quality monitoring.	SNCF Mobilités	Action closed	O
		R2	Finish drafting version B of technical data sheet TR 1 018 on the elimination of axle defects and enforce it by ensuring that its prescriptions are fully understood and applied by all personnel in charge of implementing it, by means of all appropriate support systems. Disseminate the filling training module (MAORRAG) to all repair centre personnel allocated to this job, including all personnel already working in this area.	SNCF Mobilités	Action closed	O

* C= Closed; O = Open

Recommendations issued in 2015

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
05/2015	Collision due to loss of control at Modane (73) on 24/01/2013	R1	Re-tighten and specify the maintenance regulation for finding and eliminating coupling devices on all wagons for which you are the entity in charge of maintenance that do not carry marks of compliance with the European standard or recognised national standards.	ERMEWA	Action in progress	O
				SNCF Mobilités Equipment division	A rewrite of the VC3503 visitor record to provide details is in progress.	O
		R2	For type C3A and C3W type distributors, make a suitable change in the specifications of the sleeves of "disconnecting" and "initial stage" devices or their assembly in order to ensure that the brake cylinder circuit is leakproof down to -25°C for a service life consistent with the maintenance schemes.	FAIVELEY-TRANSPORT	Investigations in progress	O
				SNCF Mobilités Equipment division	Action in progress	
		R3	When the modification specified in recommendation R2 has been perfected, apply it at the time of inspections of the relevant distributors in wagons for which you are the entity in charge of maintenance.	SNCF Mobilités Equipment division	Awaiting release product from studies called by R2 recommendation	O
06/2015	Collision between a TGV high-speed train and an articulated tank transporter at Saint-Rémy-de-Sillé (72) on 15/10/2013	R1	Prevent the access of low-clearance vehicles by all appropriate means to local road No. 3 or restore the profile along this route immediately to the north of level crossing No. 128 so that these vehicles can cross it without getting stuck.	SNCF Réseau Saint-Rémy-de-Sillé municipality	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2015 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
06/2015	Loss of control of a regional express train at Mérens-les-Vals (09) on 18/12/2013	R1	Update regional application document INFP MPY 01074 on preventing skidding, wheel sliding and deshunting, taking feedback and notifications from drivers into account. In this framework, include the section of line connecting Ax-les-Thermes to Latour-de-Carol among those which repeatedly show deteriorated adhesion requiring suitable preventive and remedial measures to be taken.	SNCF Réseau	Action closed	C
		R2	In the procedure manuals intended for personnel in charge of rail traffic management, specify the steps to be taken in the event of major skidding, particularly in the event of repeated skidding not limited to a precise location.	SNCF Réseau	The work schedule forecasts the completion of all work for the end of 2017.	O
		R3	Introduce organisation and checks at the Toulouse service station to ensure that sand hoppers are filled each time an AGC type train passes.	SNCF Mobilités	All immediate actions were taken. A full tracking table has been set up and the full implementation is monitored.	O
		R4	Improve the braking performance of high-capacity self-propelled trains in cases of poor adhesion by: - quickly lowering the speed threshold below which electromagnetic rolling stock brake blocks must not be in contact with the rails to as low a level as possible that is compatible with the infrastructure and passenger comfort and with the constraints on this rolling stock; - prescribing and organising systematic checks on the operation and filling of sand hoppers every time the rolling stock visits the service station.	SNCF Mobilités	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2015 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF	Code*
09/2015	Inter-city train derailment at Bretigny-sur-Orge (91) on 12/07/2013 (Final report)	R4	By means of external audits and on the basis of explicit targets, check that changes in the average age of the different components of the national rail network comply with the guidelines adopted and that the resources allocated to maintenance are consistent with the requirements in connection with the state of the facilities and the expected performance.	SNCF Réseau	Action in progress	O
		R5	Improve the management personnel allocation policy in bodies in charge of maintaining the rail infrastructure: - by avoiding concentrations of young managing personnel in operational units and keeping this objective in mind when determining the managing personnel to organise these units; - by ensuring the required complementarity of skills, competence and seniority of the teams at the head of the rail track sectors, including the line manager, the support technician and the operational technician. - by reducing their turnover, particularly in establishments located in the Île-de-France region.	SNCF Réseau	Action in progress	O
		R6	In the safety audits of bodies in charge of rail infrastructure maintenance, always include inspection of the actual state of a sample of equipment on which monitoring or maintenance work has recently been carried out in order to assess the relevance of the maintenance regulations and the quality of their implementation. In this connection, pay particular attention to the implementation of supervisory and inspection tours for category B switch points and crossings.	SNCF Réseau	The external body in charge of these audits on behalf of SNCF Réseau has started these checks.	O

* C= Closed; O = Open

Recommendations issued in 2016

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
01/2016	Multiple fracture of rail passed at high speed by trains in Carbonne (31) on 26/11/2013	R1	In accordance with the programme established after the Carbonne rail fracture, depending on the track condition and local operating conditions, replace the half-turnings with the old type of machining on which a rail fracture would not be detectable by a track circuit. Furthermore, ensure the implementation of the enhanced procedures for monitoring all faults affecting these devices.	SNCF Réseau	A replacement programme for half-turnings is underway. The action is due to end in December 2017.	O
		R2	On line sections without a signal-related track circuit, the operating procedures must take into account the risk of rail fracture in the event of a malfunction of any track-based system.	SNCF Réseau	Action in progress	O
		R3	Assess a change in the opposable reference system relating to train traffic providing, in case of doubt as to the nature of the shock felt on the train, a lighter procedure than the current procedure for reporting an abnormal shock, in particular for line sections without continuous coverage by track circuits connected to signalling.	SNCF Réseau	Action in progress	O
				EPSF	Action in progress	O

* C= Closed; O = Open

Recommendations issued in 2016 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
01/2016	Catch-up collision between a regional express train and a TGV in Denguin (64) on 17/07/2014	R1	Design and prescribe sentry box models ensuring perfect protection against the risk of intrusion of rodents as soon as they are put into service and throughout their use. Improve the interior layout of existing sentry boxes to facilitate verification of the integrity of electrical wiring.	SNCF Réseau	Action closed	C
		R2	Beyond the scheduled maintenance and cleaning operations of the premises, recommend searching and reporting rodent breaches and damage to the wiring during any preventive or corrective intervention carried out in the signalling premises. Set up the traceability of signing and standardise the deadlines for corrective interventions.	SNCF Réseau	The reference IN366 dealing with maintenance intervals will be modified. Action in progress	O
03/2016	Collision between a regional express train and a tractor-trailer lorry in Montauban (82) on 09/12/2014	R1	Reposition the B13 sign in line with regulations, which is currently installed at the entrance of chemin du Quart at the intersection of chemin du Quart with RD 928, so that it can be seen by a HGV driver right from the RD 928 to enter the chemin du Quart. Complete the vertical police signage relating to the traffic ban on chemin du Quart for vehicles over 3.5 tonnes coming from chemin de Chaubart, chemin de Capperouge or Chemin de Bégué.	Montauban municipality	Action closed	C
		R2	Remove the “residents only” signs on the B13 signs on the Chemin du Quart, possibly replacing them with “authorised vehicles only” signs; Make sure it is in line with the ad hoc prohibition order.	Montauban municipality	Action closed	C
		R3	Implement one for the two following solutions: Prevent, by any appropriate means, the crossing of level crossing no. 169 by heavy goods vehicles over 3.5 tonnes, Or Extend level crossing no. 169 and its accesses by (at least) five to six metres.	Montauban municipality	Action closed	C
				SNCF Réseau	Action closed	C

* C= Closed; O = Open

Recommendations issued in 2016 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
05/2016	Collision of a regional express train stopped at the platform by an infrastructure monitoring train at Saint-Germain-des-fossés (03) on 15/12/2014	R1	Ensure the recording and traceability of telephone exchanges between the train drivers and the traffic agents and traffic management department whose telephone numbers appear in the technical records of the national railway lines.	SNCF Réseau	The roll-out programme is underway, it can be broken down into three phases: - In the short term, deployment of telecommunication recorders at 100 sites (completed); - In the medium term, deployment on the GSM-R recorder network, target date mid-2017; - In the long term, deployment of new generation railway telephony (TFNG) will include a recording functionality.	O
08/2016	Accidental diversion of a suburban RER A train into siding in Saint-Germain-en-Laye (78) on 09/12/2014	R1	Reinforce the practical training and supervision of young SE supervisors on the aspects related to work on safety installations, with particular emphasis on the mandatory provisions specific to shunting work.	SNCF Réseau	The action will focus both on the initial training of the supervisors and operators, and on support for continuous training.	O
		R2	Improve the readability of the SNCF standards relating to work on security installations by clearly highlighting the imperative security provisions and explaining the associated issues. Pursue the development of simple and educational business documents for operators for different types of work on security installations.	SNCF Réseau	Three INs are currently being rewritten. The INs concerned are: - IN 3224: Safety installations - Signalling and testing - IN 1584: Security installations - Testing agents - Title - Competence monitoring - IN 7217: Common requirements for signalling works contracts - insurance and quality control	O
		R3	Initiate an action programme aiming to ensure the reliability of compliant documents relating to safety installations.	SNCF Réseau	Implemented action	C

* C= Closed; O = Open

Recommendations issued in 2016 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
08/2016	Accidental diversion of a suburban RER A train into siding in Saint-Germain-en-Laye (78) on 09/12/2014	R4	Provide local procedures to ensure the adequacy of testing programmes developed as part of the small work on security installations.	SNCF Réseau	SNCF Réseau decided to implement the following actions: a) Organise a monitoring or recycling action on simple tests for heads of newly authorised districts or those who have not practiced for more than two years by 31/12/2017. This action will be organised by the infrapole/infralog but carried out by the test group leader of the computer relay station concerned. Infrapole/infralogs will be in charge of monitoring recycling needs. b) Immediately organise on systematic support for the newly authorised young CCRNs, during their first tests, with a referent who will be chosen together by the PRI and the Infrapoles/Infralogs. c) Increase the CCRNs's awareness, when issuing the "simple tests" authorisation, of the need to have this support from a referent during their first tests.	O

* C= Closed; O = Open

Recommendations issued in 2016 - continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
11/2016	Loss of control of a regional express train following a collision with cattle at Serqueux (76) on 20/10/2015	R1	Implementing the AGC Improvement Plan Effectively implement the modifications of the purge valves and their protection by the end of December 2017 and the modifications of the 72 V electrical circuit, by the end of September 2019 across the fleet concerned.	SNCF Mobilités	Action in progress	O
		R2	Positioning of the obstacle-deflector and protection of sensitive underslung parts By involving the rail sector and having determined the most appropriate form for the European context: - explain how to calculate and operate the rolling stock construction template in order to optimise the positioning of the obstacle hoists with respect to risk overlap of an obstacle on the track; - formulate the necessary requirements for the identification of sensitive underslung parts, their protection and their height positioning in relation to the obstacle-deflector.	EPSF	Action in progress	O
11/2016	TGV high-speed train derailment at Gare de Lyon in Paris (75) on 28/01/2015	R1	Reinforce the practical training and supervision of young SE agents on aspects related to the maintenance of very particular old security installations.	SNCF Réseau	Action in progress	O
		R2	Improve the quality of local standards relating to the maintenance of security facilities by continuing to develop simple and educational business documents for operators concerning very particular old installations.	SNCF Réseau	A memo-guide for the maintenance of this type of installation has been produced. Risk analysis work aimed at detecting very particular old installations will be carried out in order partly to adapt the technical standby and secondly to develop a rewriting plan for this documentation. By the end of 2017, Infrapole establishments will be asked to carry out the census of local standards in order to check their quality and to make them accessible in the document management IT system.	O
		R3	Modernise the installations of Posts 1 and 2 of Paris-Gare-de-Lyon as soon as possible.	SNCF Réseau	Action initiated at the end of 2016 and closed in March 2017 with the setting up of a new position.	O

* C= Closed; O = Open

Recommendations issued in 2016 – continued

Report date	Title of the investigation	No.	Wording of the recommendation	Entity	State of progress of action taken by EPSF at the end of 2016	Code*
11/2016	Regional express train derailment due to trail through of points in Laroche-Migennes (89) on 01/12/2015	R1	Specify the procedures for using the Point R safety installations, particularly when the emergency key is used.	SNCF Réseau	Action in progress	O
		R2	Specify the roles and assignments of the permanent operational managers at regional and national levels, particularly in terms of security, so as not to interfere with the tasks incumbent on local operators.	SNCF Réseau	Action in progress	O
12/2016	Collision between an exceptional transport and an Intercités train in Nangis (77) on 21/04/2015	R2	Amend the decree of 18 March 1991 relating in particular to level crossings, to extend the use of telephones used at railway crossings to alert the agents in charge of the rail traffic in case of emergency.	DGITM	Action in progress	O

* C= Closed; O = Open

Appendix 2: STRMTG (Ski Lift and Guided Transport Technical Department) table showing monitoring the implementation of guided transport recommendations issued by BEA-TT

Recommendations issued in 2012

Completed recommendation:	**R**
Amended recommendation:	**RM**
Recommendation in progress:	**EC**
Rejected recommendation:	**NR**
Unknown outcome:	**NC**
Outcome not monitored by STRMTG:	**NS**

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Passenger train impact against buffers that occurred on the 12 July 2011 at Calvi Station (2B)	R1	Improve driver training and employment terms taking account of the peculiarities that the operation of the network in question involve, especially during the busy summer period.	SAEML CFC	17/07/2012 (CFC)	Reorganisation of the equipment/engine department in progress. Introduction of a resources manager on 9/5/2012. For driver training review of MT011 “Specifications for Driver Training” is currently being revised. New driver monitoring by head driver.	EC
	R2	Organise pedestrian pathways between the beaches, port and town of Calvi in order to channel flows towards the railway crossings identified and developed as such. In that context, fence off the railway tracks as much as possible from level crossing no. 26A and the station platforms.	CTC, SAEML CFC, Commune Calvi	17/07/2012 (CFC), 22/05/2012 (Calvi)	Municipality of Calvi: work incumbent upon CTC or SAEML CFC. SAEML CFC: COPIL participation in the study to make pedestrian crossings between Calvi and Monticello safe. Temporary arrangements and 9 LC pedestrian grading in summer 2013. Final arrangements for a total of 15 LC pedestrians due by the end of 2014.	EC
	R3	Improve the passenger transit and parking conditions at Calvi station by suitable sizing of platform and access area taking account of the busy summer period.	CTC, SAEML CFC	17/07/2012 (CFC)	Renovation of Calvi station provided for in the investment programme. Temporary measure: platform no. 3, as an intermediate platform and no longer a parking platform (area bounded by chains and appropriate signage). Fencing provided between LC 26A and the passenger platforms. Provision of signs to indicate platform numbers. Depot gates kept closed.	EC
	R4	Ask the Corsica Railways operator to draw up a safety handling assessment on the network dealing in particular with the state of the operating documents and the effectiveness of their implementation, and invite them to draft a plan to improve safety conditions for their operations based on practices in comparable networks in France and abroad that is suited to its peculiarities and its forecast changes.	CTC	N		NC
Technical investigation report on the derailing of a tramway train on tyres at Clermont-Ferrand (63) that took place on 10 January 2011.	2011-001-R5	Ensure the strengthening, and then regularly check the correct operation of the organisation and the running of the control process and feedback relating to the Clermont-Ferrand tramway in order that any safety anomalies detected may form the scope of corrective or palliative measures within timing that is appropriate to the risks being analysed.	STRMTG	28/08/12	We have already put in place the terms for special monitoring intended to enable us to ensure the strengthening of the organisation and piloting of the control and feedback process for this tramway, as you have recommended. This action has been taken while taking care that this strengthening of State intervention will not give rise to the disengagement of the primary stakeholders, those who are in direct charge of maintaining safety levels.	R

Recommendations issued in 2012 - continued

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on a collision between an Orléans tramway train and a car that took place on 23 April 2010 at Olivet (45)	2010-03-R3	Refine the approach used at national level for identifying, on tramway lines commissioned before May 2003, the fixed obstacles that must form the scope of preventive initiatives as a priority in order to reduce the risks they present in the case of collision. In this context, extend beyond accidents alone, the criteria that enable the special dangers of an intersection to be assessed with regard to the fixed obstacles that are located in proximity.	STRMTG	28/08/12	We have selected *(in the context of preparing the DSR)* a method that addresses the most worrying crossroads. Today, most of the DSR preparation has been completed. The prefects have given their opinions or recommendations to the various AOTs. It does not seem to me to be appropriate to reverse these decisions immediately. However, it is obvious that regular periodical monitoring of the tramway networks by the STRMTG offices would be beneficial to add to the list of crossroads at which the presence of a fixed obstacle turns out to be an unacceptable aggravating factor.	NR
Technical investigation report on a collision between an Orléans tramway train and a coach that took place on 25 June 2011 at Fleury-les-Aubrais (45)	2011-008-R2	Conduct a study of the risks liable to be run by announcing to tramway drivers that their train is being taken into account by the crossroads controllers and add, if required, to the technical guide entitled “Driving Assistance Signals for Guided Transport Systems such as Tramways or Similar - Operating and Safety Principles” appropriate recommendations to limit these risks.	STRMTG	30/05/13	To sum up, the risk of overconfidence potentially generated by the device that announces to drivers that their train has been taken into account by the crossroads controllers did not arise during this investigation. In conclusion, your recommendation to “conduct a study of the risks liable to be incurred by announcing to tramway drivers that their train is being taken into account by the crossroads controllers” seems to us worthy of consideration. This is a serious behavioural study that seems to us to be disproportionate to the benefits expected at tramway system safety level. We do not deny that driver assistance systems can have undesirable effects on driving, and that drivers seem sometimes to disregard elementary safety rules, but we prefer to stress the training and monitoring of driving practices to operators.	NR
		In addition, BEA-TT encourages STRMTG to continue implementing the recommendation it sent to it at the end of the technical inquiry on the collision between a tram and a private car that took place on 4 June 2007 at Saint-Herblain in Loire-Atlantique (44), concerning fitting tramway trains with video cameras pointing towards the area to be traversed.	STRMTG	30/05/13	Recommendation made systematically in the context of the purchase of new vehicles	R

Recommendations issued in 2015

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Fall of a child under a tramway train that occurred on 28 April 2013 at “René Cassin” Station in Nantes (44)	R1	Adding to the operational resources and procedures for triggering and processing alarms so as to ensure, as soon as there is the suspicion of an accident, the rapid stoppage of the tramway vehicles involved. To this end, providing the stations on the Nantes tramway network with simple devices to enable any witness of an accident to issue warnings to the central control station without delay.	SEMITAN		display of an emergency number at all tram stations and development of a procedure at the PCC for handling calls	

Recommendations issued in 2016

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Mortal fall of a traveler in a tramway after emergency braking on 3 September 2012 in Montpellier (34)	R1	Request the tramway operators to ensure that the driver has sufficient time, and certainly more than two seconds, between the moment when an alarm indicates that they are unable to activate the safety device and the one where the corresponding emergency brake is activated.	STRMTG	05/07/16	This measure tends to reduce the occurrence of untimely standby FU unrelated to a driver's potential unease. The STRMTG will initiate a discussion with the operators and the Transport Organising Authorities to determine the conditions for implementing this recommendation. For future rolling stock, the technical guide "Tramway Watch Function - Safety Requirements" being developed by the STRMTG will take into account this recommendation. Technical guide "Tramway standby function" published on 10/02/2017	R
	R2	Check that the NF EN 13452 standard is specified in the safety files of the next tramway trains. In particular, ensure that the emergency braking design achieves different performance levels depending on whether it is triggered by the driver or by the standby device.	STRMTG	05/07/16	Designing an emergency brake with different performance levels depending on whether it is triggered by the driver or by the FU Standby is a measure that tends to reduce the severity of the events associated with the emergency brake activation related to standby. The STRMTG has already started this work with the rolling stock manufacturers and the latest generations of rolling stock already have different braking performance levels depending on whether it is triggered by the driver or by the FU standby. These elements will also be included in the aforementioned guide. Technical guide "Tramway standby function" published on 10/02/2017	R
	R3	Examine, in conjunction with operators and the STRMTG, to what extent instant deceleration and jerk of existing trains can be decreased under acceptable technical and economic conditions when emergency braking is triggered by the standby device or by technical security measures unrelated to a proven and imminent danger outside the train.	ALSTOM			
Derailment of a train on the Nice-Digne-les-Bains line, following the fall of a rock, on 8 February 2014 in Saint-Benoît	R1	Define a common monitoring device for the rocky slopes overlooking the railway or road rights-of-way, in areas at risk of falling rocks, in order to detect the warning signs of mass destabilisation and check the condition of the protective devices. Specify the criteria for triggering exceptional inspections and measures to take in case of the detection of an anomaly.	PACA Region, Interdepartmental Direction of Mediterranean Roads	2016	"The RRT PACA has already concluded with the General Council of Alpes-Maritimes an agreement that defines a common alert procedure for road and railway networks in the case of a fall of a block or a landslide. This agreement has been included in the safety regulations of the Chemins de Fer de Provence in the form of a local directive DL-INF no. 2. The RRT PACA is currently working with DIRMED to establish an identical procedure for the risk zones identified in the Alpes de HauteProvence department. Field monitoring and risk studies led to the construction of structures for protection against falling blocks. This work was funded under the contractual investment programmes (in particular CPER and PDMI)." STRMTG Opinion delivered on 28/10/15 on the pre-report; 23 June 2016: the STRMTG relaunched the study for the development of a forecasting tool for a more rational consideration in railway operations, variable data of natural hazards. CEREMA will deal with natural hazards, and the STRMTG working group and operators will propose associated operational measures. Ongoing contact with IRSTEA and SNCF. *Their study is ongoing at the start of 2018. The Cerema must finish the inventory phase of the two networks before the alarm threshold proposals according to the climatic hazards.*	EC

Recommendations issued in 2016 - continued

Unknown outcome: NC

Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
The collision of two metro trains on 18 June 2013 in Toulouse (31)	R1	Ask the operators of automatic VAL metros that have steep sections of track, located in the open air or tunnel entrance, to counter-streak their tracks by directing the arcs of the striations in the opposite direction of the slope, to improve the evacuation of water.	STRMTG	23/12/2016 30/01/2017	13-14/12/16 : Inter-VAL GT: exchanges with the profession on the content of the STRMTG recommendation 30/01/17: Publication of a recommendation from the STRMTG headquarters 15/06/17: deadline for the operators' responses 15/10/17: effective date when notices were issued to operators after analysis of their responses Points still monitored by the control offices in connection with the notices issued	EC
	R2	To ensure that VAL metro operators have an efficient procedure for monitoring the level of dirt on tracks and effective cleaning tools when criteria such as clogging of streaks are met.	STRMTG	23/12/2016 30/01/2017	*It should be noted that Recommendation R3 was the subject of a remark to all operators in the STRMTG notices issued: "However, I am asking you, while waiting for a tool to measure track adhesion on an ongoing basis [R4], to now show in the annual report a follow-up of the level of adhesion achieved with the help of means currently available, specifying the operational procedure employed,"* *This comment links recommendation R3 (STRMTG) to recommendation R4 (Siemens). The progress of recommendation R4 on the development of the tool is difficult today (Siemens is waiting for all networks to adhere to the approach (reasons a priori financial) and the STRMTG does not currently have action levers, it is feared that ultimately, the follow-up given to recommendations R3 and R4 will not be the expected ones.* *Overall, the topic of adhesion is regularly and consistently addressed by the Inter-VAL WG, which brings together the entire profession.*	EC
	R3	Have VAL metro operators check and, if necessary, restore traction on the tracks of their network.	STRMTG	23/12/2016 30/01/2017		EC
	R4	Develop, in conjunction with the operators of the VAL automatic metro systems and the STRMTG, an effective way of measuring the grip of the tracks. Develop the corresponding operational instructions for triggering corrective actions when these tracks no longer provide sufficient adhesion, including in adverse weather conditions.	Siemens	10/10/16		EC
		"Furthermore, without making a formal recommendation, the BEA-TT: *➢ invites the Siemens manufacturer and the building owners of the future VAL automatic metro lines or their future extensions to check the proper compliance with the requirements for the manufacturing of the tracks and to introduce a measure of their adhesion, making it possible to constitute a "point zero";* *➢ calls on light-rail manufacturers to equip the next models of tyre trains they will develop with anti-lock devices;* *➢ sees only advantages in pursuing and developing the current actions of research dealing with tyre adhesion of automatic VAL metro trains on their metal tracks, and invites other designers and automatic metro operators to join or conduct similar ones in connection with the STRMTG;* *➢ encourages the Michelin company to increase the adhesion of the next series of tyres intended for the VAL automatic metro trains that it may put on the market."*				EC

Appendix 3: STRMTG (Ski Lift and Guided Transport Technical Department) table showing monitoring of the implementation of ski lift recommendations issued by BEA-TT

Recommendations issued in 2012

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical inquiry report on a personal accident that occurred on the 'L'écho alpin' chair lift in Châtel (74) on 23 February 2011.	R1	Upgrade the model of chair involved in the accident in order to reduce the risk of jamming of rucksacks or clothing fastenings with this kind of chair, especially between the roof bow and the seat.	POMA		See POMA/BEA correspondence, shared on the BEA-TT website: POMA first of all stressed the need to improve non-boarding detection, which BEA deemed did not meet their recommendation. POMA then announced that they were working on a new kind of seat, where the issue of jamming is covered by placing caps over certain constructional details.	NC
	R2	Define a method that will enable the identification, prior to the issue of compliance certification for chair lift seats required by European Directive 2000/9/CE relating to cable facilities transporting people, of the risk of attaching equipment to landings, and promote the implementation of such an approach with the coordinating group for notified bodies.	STRMTG		STRMTG has analysed the issue and has researched how the problems have been dealt with in other sectors. It turns out that EN1176-1 relating to playground equipment and flooring proposes a test method for assessing the risk of jamming a child's clothing string with a duffle coat button at the end. That test is intended to eliminate design details that are liable to produce direct body part jamming or strangulation during the normal use of the play area. STRMTG-ON believes that it is unrealistic to hope to define catch-all modelling criteria for items that can be caught. However, in its internal specifications on the instructions of conformity of the seats, it introduced a point of vigilance on the assessment of the risk of collision, which, if not completely objective, nevertheless incites to identify the main jamming risks (as the BEA-TT did in its report) and to find solutions for improvements. The issue was raised at a meeting of notified bodies on the 15/05/2013. The group of NB stated it was convinced that the design of the seats (and thus their checking) should not be brought to the fore as regards entanglement risk and that the residual risk involved in an entanglement and a non-disembarkation is covered by operator supervision at the station	R
	R3	As part of the next revision of European standards for safety requirements applicable to cable facilities transporting persons, proposing on the one hand to the "TC242" European standards committee that the requirement handling equipment entanglement risks at disembarkation from chair lifts be clarified and on the other hand that the means or methods to check fulfilment be defined.	STRMTG		During the CEN investigation on the draft review of EN 13796-1 (the review by WG5 ended in September 2011 and the part for expressing remarks from the CEN investigation took place from June to August 2012), France made a comment intended to ask for clarification of section 11.4.1.2. of the standard within the meanings indicated by BEA-TT Discussions on that comment took place on 28 November 2013 and WG5 rejected the French request, since the experts considered that it was impossible to eliminate any source of entanglement and to define a universal risk assessment method. The following events were referred to during those talks: - All seats cannot be of the "bucket" type because they must often include folding seats and/or backs (in order to avoid snow build-up during and outside of operation), or openings in backs (to reduce wind resistance), which form a number of design details in which belts or various items of clothing can potentially become entangled. - Seat makers are confronted with a large variety of materials (rucksacks, clothing and various accessories) and it is impossible for them to define criteria to model the items that might become entangled. Any such definition would be subjective and perforce involve the choice of non-representative material.	R (proposal made by France) NR (proposal not accepted by the WG5 experts)

Recommendations issued in 2012 - continued

Completed recommendation:R
Amended recommendation:RM
Recommendation in progress:EC
Rejected recommendation:NR
Unknown outcome:NC
Outcome not monitored by STRMTG:NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical inquiry report on a personal accident that occurred on the 'L'écho alpin' chair lift in Châtel (74) on 23 February 2011.	R4	Strengthen tools and methods to enable identifying the appearance of gaps between operating practices and the rules and requirements of all kinds that must be applied, and durably remedy the gaps observed.	SEM Sports et Tourisme		See SEM letter dated 12/10/2012: Several actions, and in particular the change of organisation at sector head level, who, freed from the specific role they could have at the level of a facility, can now work within their sector and its various facilities, specifically taking a second look. In addition, internal safety inspections are due in situ, so as to provide an "independent" view of operations.	NC
	R5	Systematically ensure after each serious accident that the operator involved performs an analysis, files the report required with the prefect with authority as required by regulations, and takes the relevant prevention measures.	STRMTG		This BEA-TT recommendation must be complied with as it simply restates regulatory provisions. This need was restated in a network meeting on 11 and 12 September 2012 and the STRMYG offices will monitor to ensure that the operator performs an analysis and prepares a formal report in the case of a serious accident.	R
		In addition, BEA-TT suggests examining the usefulness of displaying a diagram at the lower station that calls the attention of users to the risks of entanglement of belts in the seats and/or prior to arrival at the upper station, and of a diagram inviting them to check that no item has become entangled in the seat.			STRMTG observes that this suggestion is not consistent with the conclusions of the Ligeron study on mountain lift passenger behaviour, which stressed the ineffectiveness of current signage, because of the shape of the panels and of their location. Accordingly, Ligeron called for the signage to be replaced. Taking account of these observations and the context, it does not seem appropriate to follow BEA-TT's suggestion.	NR

Recommendations issued in 2013

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical inquiry report on passenger fall from a Pleney cable-way car that occurred on 31 December 2011 in Morzine (74)	R1	Permanently strengthen the handling of operational safety of the Pleney cable-way and, more generally, of all the ski lifts that serve the Pleney and Nyon areas by: - Increasing training and skills-monitoring of the staff involved, of the head of operations, the area manager, drivers and watchpersons; - Formalising the safety procedures to be applied both in normal operations and in fail-safe mode, including in the case of accidents or incidents into operating instructions; - Organising effective internal checks, including an independent level of operational running of the facilities involved; - Ensuring exhaustive logging of incidents and accidents and of the remedial action undertaken.	SA du Pleney		See response from SA du Pleney dated 18 July 2013 published on the BEA-TT website. SA du Pleney has incorporated the BEA-TT recommendations into a plan of action (15 actions) drafted after a safety audit performed by an external consultant in April 2012. Also see BHS audit following the accident	EC

Recommendations issued in 2013 - continued

Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation nc	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical inquiry report on passengers falling from a Pleney cable-way car on 31 December 2011 in Morzine (74)		*Furthermore, in the sequence of recommendations made in the inspection report that the Environment and Sustainable Development General Council (CGEDD) made on the safety of mountain lifts and of track-guided transport, BEA-TT:* *- Invited the Directorate General for Infrastructures, Transport and the Sea (DGITM) to launch a study into additions to be made to regulatory requirements, in terms, on the one hand, of the approval of ski lifts by operators, by heads of operations and by staff that perform major safety tasks, and on the other hand, of setting up, partly independent internal checks for larger facilities on their operations;*	DGITM		The Tourism Code was amended by the decree of 19 January 2016 to introduce the obligation for all operators of ski lifts and mountain conveyors to implement a safety management system (SMS), i.e. a device that aims to organise all the means, rules, procedures and methods implemented at the level of each operator with a view to ensuring the safety of their activity. With regard to the SMS validation and monitoring procedure, the operator must choose one of the following two possibilities, permitted by the regulations: - Case 1: submit its SMS to a validation and control procedure with the services of the State; in this case, the regulation provides for a training period of 2 months; - Case 2: submit its SMS to a periodic inspection by an accredited or approved inspection body within 6 months from the date on which it begins operating; this period is extended to 2 years for existing operators. Thus, since 1 April 2016, all new operators1 must notify the State services of the existence of their SMS before they can start their activity. In addition, if the operator uses Case 1, the SMS must have been validated by these services in order to carry out its activity. In terms of the operators in place, the deadline for the application of the above-mentioned provisions was extended to 1 October 2017, except for those operating only ski lifts or conveyors, for which the deadline of 1 October 2019 was established. A ruling dated 12/04/2016 specifies the content expected for each SMS, in particular the consideration of 8 mandatory issues. These issues include skills management. If an enabling device is not required by the decree or the STRMTG RM-SGS1 guide which complements it, the device clearly articulates the identification of the security tasks, the definition and the implementation, and the follow-up of the qualifications corresponding to the complexity of these tasks, then the organisation of operations to ensure the availability on the ground of qualified personnel. For the moment, these provisions will be upheld and will be the subject of an evaluation for second time to see if they need to be reinforced. The organisation of a permanent internal control system is another subject that must be dealt with in the context of SMS, even if its definition is left to the discretion of the operators. The independence of this internal check from the staff in charge of the operation was not required.	R
		- Encourage the ski lift and guided transport technical department (STRMTG) to develop a programme for inspecting operators of mountain lifts, based on a formalised methodology and references.	STRMTG		Initial experiments on the use of the audit technique to complete the RM control tool panel were carried out from 2005-2006. After the merger of code inspectors with STRMTG at the end of 2011, joint criteria for planning operator inspections have been defined and inspection frameworks have been rediscussed. Nowadays inspections are performed by all offices of STRMTG and internal communications meetings have been organised to enable experience to be shared and for the tool to be further refined. This practice is supported by the introduction of safety management systems.	R

Recommendations issued in 2013 - continued

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on the fall of five cars from the "Aup-de-Véra" cable car that occurred on 13 October 2011 on the skiable area in Flaine (74)	R1	Together with manufacturers and operators, organise studies and trials of technical or organisational devices to be developed in order to detect any cars or chairs in ski lifts that jam while passing a pylon. Updating regulations, standards or guidelines in accordance with the conclusions of those analyses.	DGITM STRMTG		STRMTG held a meeting with professional partners to ask them to consider the issue in June 2014. During 2015, STRMTG had to define the specifications to state the expected performance and the scenarios that must be taken into account by these arrangements. However, for planned workload reasons, the STRMTG could not move as fast as desired on the file and these specifications were not established. However, bilateral contacts have been made with some RM manufacturers to discuss the subject. It shows rather contrasting positions; adherence and proactivity on the one hand, doubts surrounding the interest and the technical feasibility (with simple means) on the other. The initial discussions with the profession seem to place the majority opinion on the side of this second position. In any case, during 2018 we plan to finalise the aforementioned specifications and to distribute them to the professional partners in order to learn their official position on the subject. This makes it possible to check the positions before directing the strategy to move forward on the subject	EC
		In addition, BEA-TT has invited approved principals and STRMTG to ensure, through tests performed prior to commissioning, that the values for maximum longitudinal tilting of the cars or chairs of new or amended facilities in all circumstances remain less than those taken into account during their design.				

Recommendations issued in 2014

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation n	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on the derailment of a Grande Motte cable car cabin that occurred on the 3rd December 2011 in Tignes (73)	2011-017-R1	By way of feedback, ensure that the design, maintenance and supervision terms for the scrapers fitted to the cable-way cars prevent the derailment risk that could be caused by those parts coming loose.	STRMTG	15.09.14	The STRMTG issued a recommendation dated 11/07/2014 aiming to: 1) List the ice scraper mountings on existing twin-cable cableway cars in France, 2) Assess the reliability of the mountings 3) Change any mountings deemed inadequate 4) Fix the terms for monitoring homogeneous mountings across France. The date for filing information for the survey has been set at Friday 12/09/2014. The summary of this survey was formalised through the STRMTG recommendation of 18/12/2014 establishing the following elements: The evaluation concluded that the scraper assemblies of the bi-cable carriages are generally satisfactory, although small, occassional improvements could still be carried out, and that it is, however, necessary to establish minimum rules for controlling these elements, given the wide variety of monitoring methods encountered on the ground. The STRMTG has therefore decided to recommend the following rules to be implemented on the two-way cable cars with carriages fitted with ice scrapers: Recommendation no. 1: At the level of the bolted fastening systems of the scrapers the implementation of solutions avoiding a loosening of the screws such as threadlock, Nylstop nut, Nord Lock washer, etc. is requested if necessary. Recommendation no. 2: In order to facilitate the visual inspection of the scrapers, it is advisable, where possible, to position their fixing nuts on the visible side. Recommendation no. 3: The RM1 guide provides in particular "§A.3.2 - weekly checks" visual checks on the carriage to check its condition. Verification of the correct position and assembly of the scrapers must be included in this weekly check. Recommendation no. 4: Implementing a check of the fixings and the position of the scrapers after each installation deicing operation. These provisions were implemented on the cable cars upon receipt of the recommendation (i.e. from the 2014/2015 season). They have been included in the RM1 guide in its Rev.3 edition of 18/05/2016.	R
	2011-017-R2	Ensuring, especially during exercises, that all timing for work set out in the Grande Motte cable car rescue plan can be complied with even in the most difficult weather conditions in which the use of the facility is permitted.	Société des Téléphériques de la Grande Motte [Grande Motte Cable Car Company]			NS

Recommendations issued in 2014 - continued

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on the derailment of a Grande Motte cable car cabin that occurred on the 3rd December 2011 in Tignes (73)	2011-017-R3	Check that the goals set in the ski lift rescue plan, especially as regards evacuation times, can be complied with even in the most difficult weather conditions in which the use of the facility is permitted. In this context, invite operators to perform exercises regularly, for each of the modes of evacuation provided, in such weather conditions and execute them on the most sensitive facilities in particular.	STRMTG	15.09.14	Feedback on past situations shows that difficult evacuations are very largely encountered in equipment at risk. A facility can be described as being at risk when it presents difficult access, extensive overflight, a watercourse, very rough or very sloping overflights (thus with difficult access on the ground), etc. The existence of specific procedures such as a zip line for evacuation or the use of car access equipment using non-standard cables are also to be considered for this definition. Furthermore, over a thousand cable-ways exist in French territory (chair lifts, cable cars, twin-cable cable cars, etc.). Reassessing their evacuation plans would demand work that the professionals involved (operators, Prefectural training departments and supervisory services) do not have the resources to provide. Taking these observations into account, it thus seems necessary to focus primarily on the sensitive facilities. After consulting the Domaines Skiables de France during July 2014, and also in liaison with the ski lift manufacturers' association, STRMTG has decided to start a procedure for identifying the facilities at risk (based on the criteria set out above) and for the assessment of the evacuation plans for those facilities at risk, incorporating the following topics: - The reliability of the evacuation method - The time it takes to mobilise teams - Evacuation times Based on that assessment, it will be possible to work to improve the plans deemed inadequate, by working with the operators involved in planning exercises in tricky conditions to corroborate the relevance of the changes deemed necessary. The target schedule was initially as follows: I Reassessment 1) Formalising the procedure with an STRMTG recommendation by the end of September 2014. Everyone will be reminded in that recommendation that the operation of a facility is subject to the operator's ability to implement the User Evacuation Plan under the conditions specified (as the BEA-TT report restates). 2) Revision of the User Evacuation Plans involved by the end of 2015. II Good practice guide Furthermore, in order to improve operators' collective capacity to properly handle the evacuation of all the equipment transported, STRMTG has decided to start drafting a guide to the application of part B of STRMTG guide RM1 on cable car evacuation at the beginning of 2015. That application guide, drafted with professional participation, in particular that of operators, will be intended to specify good practice with regard to the design, execution and maintenance of evacuation plans. In particular it will enable a practical context to be specified for handling evacuation exercises, which stresses the need to perform exercises regularly on the various kinds of facilities installed at each location, especially on facilities at risk, including in difficult conditions. For reasons of load plan, these different works have not yet been implemented. They remain within the objectives of the STRMTG and will be reprogrammed soon after the release of the report of the September 2016 incident of the PMB based on the resulting recommendations, some of which should also concern this issue of evacuation.	EC

Recommendations issued in 2014 - continued

Completed recommendation:R
Amended recommendation:RM
Recommendation in progress:EC
Rejected recommendation:NR
Unknown outcome:NC
Outcome not monitored by STRMTG:NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on the fall of a skier from the "Fontaines-de Cotch" chair lift that occurred on 22 December 2012 on the skiable area at Gourette in Eaux-Bonnes (64)	2012-017-R1	Increase the safety of boarding of users onto the "Fontaines-de Cotch" chair lift by any appropriate technical or organisational means that will either physically limit the risks of a fall or significantly extend the area that can be effectively supervised.	EPSA			NC
	2012-017-R2	Ask all chair lift operators to ensure that their boarding area layout, their working conditions, the amount and nature of their use, the methods for supervision and their equipment form a cohesive unit that guarantees safe boarding of users and optimal supervision when they take their places in their seats. Coordinate the resulting upgrade campaign and support the efforts of builders and operators in the development, implementation and evaluation of additional fall prevention and monitoring assistive technology.	STRMTG	12/09/14 (response to draft report)	We are considering its implementation through an approach aimed at defining a methodological framework enabling operators to analyse their chairlifts with respect to their exposure to the risk of falling passengers and to define arrangements, organisation and equipment in a coherent manner vis-à-vis the main identified risk factors. A schedule could then be established to allow operators to make the necessary changes.	EC
	2012-017-R3	In the technical guides relating to the design and operation of cable-ways, specify, adjust and ensure the overall consistency of the requirements for safe boarding on chairlifts so that their application ensures optimum prevention of user falls in the development, equipment and operating conditions of the installations concerned.	STRMTG	12/09/14 (response to draft report)	Recommendation R3 will be dealt with according to the aforementioned methodological framework, and the relevant provisions will then be incorporated during the tidying-up of the cableway decrees and guides, which should take place in 2014-2015.	EC
	2012-017-R4	For each of the chairlifts that serves the Gourette skiing area, define the automatic actions that the staff in charge of supervising operations must adopt when they detect a user in difficulty after boarding, and train staff in their implementation. Extend that initiative to the Pierre-Saint-Martin area.	EPSA			NS

Recommendations issued in 2014 - continued

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Technical investigation report on the fall of a car from the Bosses cable car that occurred on 2 February 2013 on the skiable area at Gourette in Eaux-Bonnes (64)	2013-002-R1	Take action with the European Standards Committee so that standard NF EN 13223 relating to the security requirements applicable to cable facilities transporting persons specify the requirements it formulates as regards the dimensions of the balance beams fitted to the pylons in such facilities and in this field provide for account to be taken of all the lateral stresses that these parts may be subjected to during operation. With this in mind, add to the provisions of the technical guidelines entitled Ski lifts - RM2 - General design and amendments to cable-ways" in order to ensure that these lateral stresses are taken suitably into account during the design of new cable car or chair lift facilities or during the repair of existing facilities.	STRMTG	17.07.14	The analyses performed after the accident and coordinated by STRMTG (and in particular restrictive measures on balance-beams fitted by the POMA manufacturer) have in fact revealed the existence of horizontal dynamic stresses on the balance beams that the current balance beam design rules do not cover. Since 2015, the STRMTG has launched a study aimed both at carrying out stress measurements on the structures of a sample of pendulums and aircraft representative of the French fleet and analysing the results of these measurements to be able to possibly define a method for evaluating the fatigue sensitivity of the French balance beam park. At the end of 2017, five measurement campaigns were carried out on different balance beam equipment and builders. A 6th measurement campaign is planned for May 2018 and the final analysis should be completed by the end of 2018. Based on the results of this study, STRMTG will act within the European Standards Committee (CEN) in order to make a proposed amendment to the standard NF EN 13223 intended to introduce practical rules to justify fatigue under dynamic horizontal loading on balance beams of single-cable cable-ways. In practice, this kind of proposal may only take place during the next revision of the standard NF EN 13223. Pending this, a change to the STRMTG guide RM2 to incorporate additional design arrangements for balance beams is difficult to envisage insofar as it would constitute a breach of the European rules for the free circulation of EC marked components.	EC
	2013-002-R2	Ensure that the operators of these cable cars and chair lift facilities establish and implement precise and verifiable visual supervision procedures for the state of balance beam bogies fitted to their pylons, which will enable any developing cracks to be detected.	STRMTG	17.07.14	Detailed specific visual checking procedures may be required when the level of risk involved in a situation demands special monitoring whilst awaiting the set-up of a permanent safety measure. Accordingly, if actions to make changes to balance beams identified as being at risk of fatigue generated by horizontal stresses (see outcomes of recommendations R1 and R3) were to be spread over a period requiring interim operation using balance beams in their pre-existing state, precise visual checking procedures could be necessary and, if appropriate, STRMTG will ensure that such procedures are duly documented and implemented.	EC
	2013-002-R3	Provide new chair lift and cable car facilities with safety devices that enable their operation to be stopped automatically in the case of total or partial breakage of a bogie on their balance beams and define the arrangements to be put in place to reach that goal on facilities currently in operation in accordance with their technical features and their operating conditions.	STRMTG	17.07.14	Fitting a breakage detector to part of the balance beam is intended to deal with the consequences of a structural failure of the balance beam but will not allow the appearance of such a failure to be prevented in the absence of action on its primary cause. Based on rules defining the justification of fatigue under dynamic horizontal loads on balance beams (see outcomes of recommendation R1), it will be possible to carry out a survey of the sensitivity of the various kinds of balance beams present across all single-cable cable-ways contributing to this fatigue phenomenon and thus to identify the designs that present weaknesses and need reviewing. STRMTG thus envisages the implementation of that initiative by defining an action programme that enables the kinds of balance beams identified as being at risk from the "horizontal" fatigue phenomenon to be dealt with. This programme may combine replacing balance beam structures with improved design structures, non-destructive testing, or even fitting them with balance beam part breakage detection for cases where replacement is not possible. That survey, which includes recent generations of balance beams, will thus will make it possible to check the proper design of such balance beams with regard to the phenomenon of fatigue connected with horizontal stresses and suitable steps to be taken if this is not the case, pending the relevant update to standard NF EN 13223. This strategy will enable action on the phenomenon identified as the initial cause of the accident at Gourette and thus significantly reduce the probability of such a breakage occurring again. Furthermore, this was the strategy that was selected for defining actions to be undertaken on balance beams of the type implicated after that accident. In this way, the main action involved replacing the bogies of two of the 420 POMA balance beams with bogies with resistance to fatigue that was improved following strain measurements on various bogies.	EC

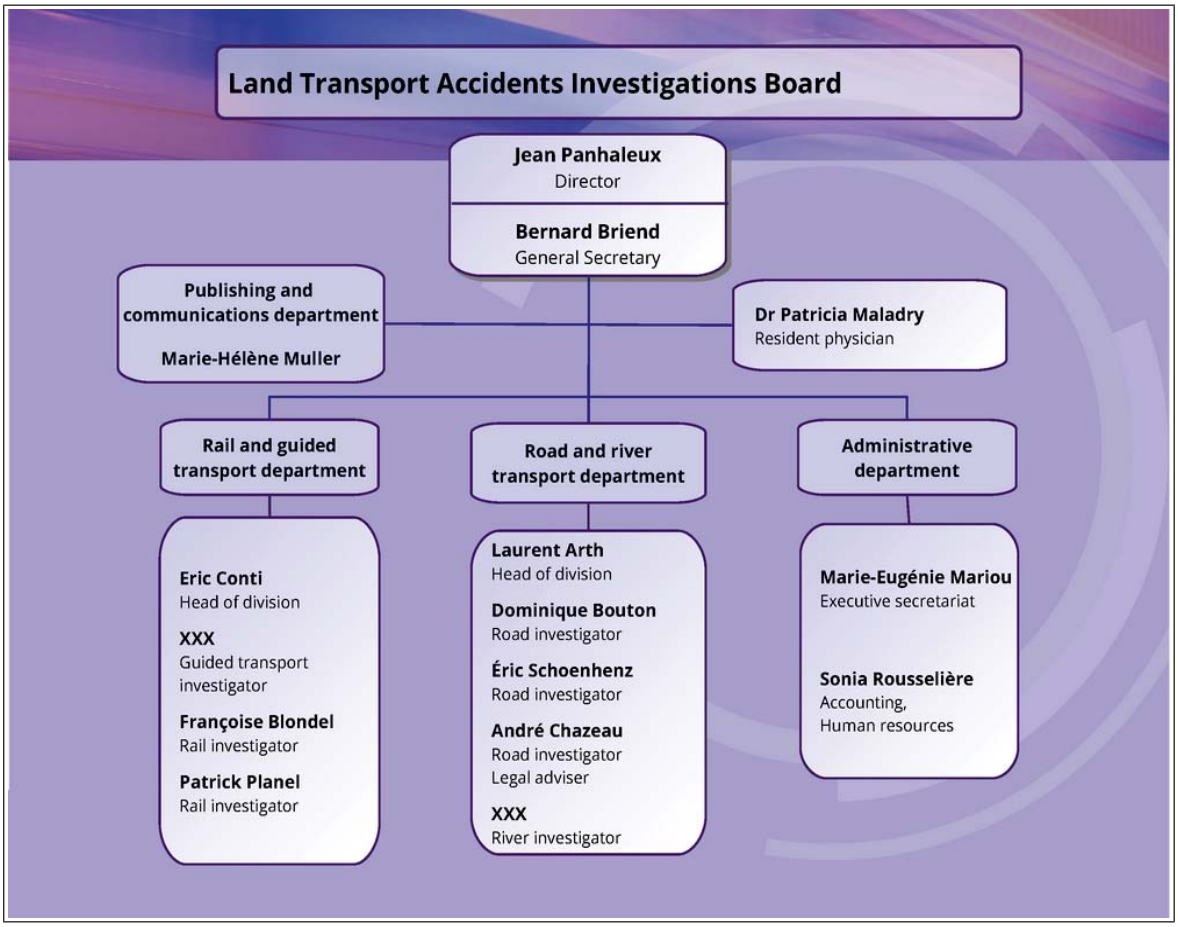
Recommendations issued in 2015

Completed recommendation: R
Amended recommendation: RM
Recommendation in progress: EC
Rejected recommendation: NR
Unknown outcome: NC
Outcome not monitored by STRMTG: NS

Investigation title	Recommendation no.	Recommendation item	Recipient(s)	Reply date	Outcomes specified and progress status (Literal and Encoded)	
					Literal	Encoding
Train derailment on "Le Panoramique des Dômes" rack and pinion railway that occurred on the 28 October 2012 in Orcines (63)	R1	Prepare a full study on the risks involved in the accidental tailgating of various track apparatus on the "Panoramique des Dômes" rack and pinion railway, and set up suitable measures to limit its impact, if justified.	TC Dôme		Following the derailment, the REX was noted by the operator and it decided to install Active and Automatic Supervision (SAA) monitoring at the crossing area. This system forces the driver to limit speed in the crossing area and to check the position of the points before crossing them with the lug end.	
	R2	Amend legislation to extend the application of regulations on track-guided transport to rack and pinion trains located in mountainous areas instead of that which applies to ski lifts. At least, if such a change of regulations were not to take place, strengthen the terms for approving the main contractors involved, by applying article R. 342-4 of the Tourism Code to rack and pinion trains so that they guarantee in-depth knowledge and experience on their part on the technologies and modes of operation of this kind of railway.	DGITM		A draft decree *that is being considered* provides for creating a specific class devoted to rack and pinion railways within the approvals system for mountain lifts, which will enable the specific features of such equipment to be better acknowledged. *A "design and operation of rack and pinion trains" guide was published on 21/12/2016, and it provides elements on the design of rack and pinion trains and essential requirements for their use.*	
Derailment of the Bastille cable car on 29 June 2014 in Grenoble.	No recommendation but an invitation	BEA-TT made no recommendations at the conclusion of its technical investigation. *It did, however, invite the operator of the facility involved, the Grenoble-Bastille cable car company, to set up specific procedures and appropriate training to enable its criminally liable managers to take a fully informed decision in the case of an incident about implementing the rescue plan or otherwise.*				

Appendix 4

BEA-TT organisational chart as on 1/01/2018



Institutional texts

European Directives No 2004/49/EC of 29 April 2004 and No 2016/798 of 11 May 2016

French Transport Code: articles L. 1621-1 to L. 1622-2 and Articles R. 1621-1 to R. 1621-26

French Tourism Code: article L. 342-8 making the following applicable to ski lifts: Articles L. 1621-1 to L. 1622-2 of the Transport Code.

Appendix 5: Glossary

- **DGEC**: Directorate general for energy and climate
- **DGITM**: Directorate general for infrastructure, transport and the sea
- **DSR**: Road safety and traffic delegation
- **EPSF**: National rail safety authority
- **FNTV**: Nation federation of passengers transports
- **LC**: Level Crossing
- **RFF**: French rail network, the body managing the national rail network until 31 December 2014
- **RFN**: national rail network
- **SANEF**: North and east France motorways company
- **SNCF**: French national railways company, a rail operator and, until 31 December 2014, delegated body in charge of managing the national rail network
- **SNCF Mobilités**: rail company in the SNCF group
- **SNCF Réseau**: body in charge of managing the national rail network
- **STRMTG**: Ski lift and guided transport technical department
- **TER**: Regional express train
- **TGV**: High-speed train
- **UNECE**: United Nations Economic Commission for Europe

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