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##### 2017 ANNUAL REPORT ON RAILWAY SAFETY

September 2018

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# A. Introduction

This is the 2017 Annual Report on Railway Safety by the Department for Railway Safety and Interoperability (DVIS). DVIS is the Belgian National Safety Authority (NSA), hereinafter referred to as ‘the Safety Authority’. This report provides an overview of the development of railway safety in 2017. It fulfils the requirements of Article 18 of Directive 2004/49/EC on safety on the Community’s Railways, implemented in Belgian law by Article 78 of the Law of 30 of August 2013 on the Railway Code.

The report is structured as recommended by the European Railway Agency (EUAR), hereinafter referred to as 'the Agency’. It deals with the following subjects:

a) the development of railway safety, including the common safety indicators (CSI);

b) significant changes to the legislation and regulations regarding railway safety;

c) the development of safety certification and safety authorisation; and

d) the results of and experience with supervision of the infrastructure managers and railway undertakings.

The DVIS delivers this report to the Agency, as required by the above-mentioned directive and to:

* the Minister for Small and Medium-sized Businesses, minister responsible for the DVIS;
* the Minister for Mobility, minister responsible for Infrabel and NMBS/SNCB;
* the Special Commission of the Belgian Chamber of Representatives charged with examining safety conditions on the rail network in Belgium;
* the Court of Auditors;
* the Investigation Body for Accidents and Incidents on the Railways (Onderzoeksorgaan voor Ongevallen en Incidenten op het Spoor - OOIS);
* the Department for the Regulation of Rail Transport and Operation of Bruxelles‑Nationaal Airport (the completion authority);
* The Head of the Federal Office for Mobility and Transport (Federale Overheidsdienst Mobiliteit en Vervoer - FOD MV);
* the railway sector operating in Belgium: railway undertakings, infrastructure manager, entities in charge of maintenance, the notified and designated bodies, passenger associations, etc.

The infrastructure manager and the railway undertakings deliver their annual reports to the DVIS by 30 June at the latest. These reports are an important source of information for the present report.

The DVIS performs other tasks in addition to the tasks of a national safety authority. These tasks, imposed by the Belgian legislature, concern, for example, the safety of vintage railway lines. These tasks are not reported on specifically in this report.

The organisational structure of the DVIS has not changed. Information on the organisation of the DVIS is available on the website.

This report is available in Dutch and French on the DVIS website: http://mobilit.belgium.be/nl/spoorwegverkeer/nationale\_veiligheidsinstantie/jaarverslagen.

The DVIS hopes you enjoy reading this report.  
Responses are welcome at [info@nsarail.fgov.be](mailto:nsa@mobilit.fgov.be).

# B. B. Overall Safety Performance and Strategy

## B.1 Main conclusions in relation to 2017

In 2017 we saw a significant increase in the number of accidents and the number of casualties and a significant decline in the number of precursors of accidents.

In comparison with 2016, the number of significant accidents increased from 22 to 33. Within that figure, the number of collisions between people and stock in motion rose from 7 to 17, of 5 which related to track works. In total, 90% of accidents related to the interface between tracks and surroundings. These findings confirm the conclusions of previous years.

The total number of casualties increased for the third time running, from 33 in 2016 to 39 in 2017, due entirely to an increase in the number of fatalities. This is the effect of, on the one hand, significant increases in the case of employees and trespassers and, on the other, a fall in the case of passengers.

As in previous years, the DVIS continues to focus on the monitoring of risk management in connection with works on the rails.

The number of recorded precursors of accidents has fallen spectacularly, an effect of a large fall in the number of broken rails and the number of signals passed at danger (SPADs). The SPADs which passed the first danger point belong to the group with the highest accident risk. They fell by half. In 2017, freight traffic reduced the number of SPADs and thus continued the trend of previous years. Passenger traffic halved its number. However, the sector is unable to carry out a clear cause and effect analysis. It therefore remains to be seen whether this development will continue.

## B.2 National safety strategy, programmes and initiatives

### Strategy and plans

The aim of the federal government is continuously to improve the level of safety on Belgian railways. The focus is on improving safety culture, investments in safety (including in ERTMS) and level crossings and dangerous goods.

There is no national plan for railway safety. However, one of the most important levers is provided by the management contracts concluded with Infrabel and NMBS/SNCB and the associated investment plans. In the chapter on safety, objectives for plans and achievements are laid down in both cases, although they obviously do not involve obligations on other actors.

The following projects , among others, are related to safety:

* Infrabel:
* plan to concentrate signal boxes: at the end of 2017 there were still 47 signal boxes, the plan for the concentration of signal boxes will reduce this number to 10 in 2022;
* action plan to prevent SPADs;
* action plan to prevent accidents at level crossings, including investments and initiatives to raise public awareness;
* action plan to prevent trespassing and suicides and projects for better screening of the track area to prevent track walking, and awareness raising;
* Infrabel and NMBS/SNCB: master plan for improving safety on the railways in Belgium. This plan provides for the swift installation of TBL1+. In parallel with this installation of TBL1+, Infrabel has committed to an ambitious programme to implement ETCS with the aim of equipping all lines of the entire network with some type of ETCS by 2022. As from 2025, ETCS should be the only protection system in operation.
* NMBS:
* adaptation of the departure procedure to replace the DICE project which was found not to be viable;
* TBL1++ software on rolling stock;
* plan 2017 TBL1+ (NG) software on rolling stock.

All railway undertakings are making efforts to improve safety further, in particular by installing the ATP systems.

### Safety consultation meetings

The accident in Buizingen in 2010 prompted the launch of the ‘safety consultation meetings’ involving the sector as a whole. The DVIS organises these meetings. They are attended by around 60 representatives of the railway sector and the transport sector. The main objective is to disseminate information and to stimulate discussion on safety matters which concern the sector as a whole. The participants are encouraged to give presentations as a basis for these discussions. The FOD MV explains the most recent changes to legislation. In 2017, a start was made on explaining the Fourth Railway Package, in collaboration with the Agency. This will also take place over the next few years . The problem of the lack of clear agreements on emergency trains was raised. A working group on tail lights (lamps or images) was launched with the sector in the mid-2017.

In 2017, safety consultation meetings were held on 27 April and 7 November.

At the end of 2017 the safety consultation meetings were given a legal basis in Article 77 of the Railway Code:

*“[…] The safety authority shall organise at least once a year a safety consultation meeting bringing together all the parties involved and interested in railway safety, and, amongst others, the railway undertakings, infrastructure managers, manufacturers and investigation body.”*

## B.3 Assessment of 2017

### Safety culture: progress, but still room for improvement

As regards both certification and supervisory activities, the DVIS notes that the maturity of the sector in terms of safety is still limited, despite the progress that has been made.

In addition, the DVIS finds that the safety management systems are still not of the required quality. All too often attention is limited to the operational aspects of safety, without looking at the safety system and safety management as a whole.

### Track works: interaction and protection of rail traffic

When carrying out rail upgrade works, Infrabel tries to disrupt rail traffic as little as possible, whilst at the time ensuring the safety of rail traffic and work sites.

Here use is made of safety systems which allow the safe passage of rail traffic along work sites, but at a limited speed and subject to strict conditions on the use of rail cranes.

Infrabel had undertaken to revise the regulations and procedures in response to the recommendations made by the DVIS in 2016, but the revision was postponed until 2018, the year in which Infrabel's five-year safety authorisation will be revised.

In 2017, the DVIS continued its inspection visits of track work sites which confirmed the findings of the 2016 campaign, namely that there are breaches of the safety procedures for working with rail cranes. These breaches can give rise to dangerous obstruction of rail traffic on the adjacent tracks or to a train collision with the crane, which naturally do not contribute to the safety at work of staff and contractors.

The DVIS will comply strictly with the developments in the regulations and procedures contained in the new safety authorisation.

### Implementation of new generations of safety systems: certain obstacles

The Infrabel ETCS master plan is not linked to the roll-out of these systems with the operators, other than NMBS/SNCB. This may mean in practice that the systems and thus the increase in safety is not keeping pace with investments in infrastructure.

In order to promote the use of the systems and to increase safety, and to avoid continued maintenance of the previous systems, Infrabel is planning systematically to phase out the Memor-Crocodile system on tracks equipped with ETCS and TBL1+ .

This naturally requires an effort on the part of the operators, both in terms of finances and organisation, to equip their traction vehicles with at least one of the two systems. In view of the high cost of ETCS, the lack of stability in the versions available on the market and the long period needed for the installation, this is not self-evident. Moreover, the operators depend on their suppliers for design and installation.

The Royal Decree of 1 July 2014 adopting the requirements applicable to rolling stock using train paths provided for the decommissioning of the Memor-Crocodile system on Belgian railway infrastructure equipped with the ETCS and TBL1 as from 1 January 2016. Since the railway undertakings in the freight sector failed to equip their rolling stock with the ETCS or TBL1+ systems in time, the deadline of 1 January 2016 was extended at the request of certain railway undertakings and their suppliers. The Royal Decree of 18 December 2015 shifted the deadline of 1 January 2016 to 12 December 2016.

## B.4 Focus areas for 2018

### Integration of system audits into supervisory activities

The DVIS will further the integrate the system audits in its supervisory activities. More than spot checks and investigations, they examine safety from a systems point of view. The consultant will provide guidance on the latter.

### Focus on SPADs

There will be a continued focus on SPADs, both within the DVIS and in contacts with the sector, to gain a better understanding of the development of them. In this regard, the effect of stricter application of the definition of the CSI on the figures will examined.

### Focus on risks in connection with track work sites

In monitoring and delivering Infrabel's safety authorisation, the DVIS will continue to focus on the risk analysis in connection with track work sites.

### Better use of checks on freight trains

Work is continuing on the anomalies catalogue. The ultimate aim of the DVIS is to collect the results of the checks carried out by all those involved on freight trains in Belgium in a readable, transparent and simple format, and to share them – anonymously – with the sector as a whole.

### Coordination with foreign safety authorities

The DVIS will continue the cooperation already under way and where necessary take new initiatives. The DVIS thus endeavours to optimise activities where different countries are involved in certification and supervision. This approach will be recommended in particular where applications are made to place rolling stock in service in cross-border projects. In particular, this approach will be recommended where applications are made for placing rolling stock into service in cross-border projects. The cooperation on monitoring with France and Luxembourg continues. Further steps are being taken with the Netherlands, taking account of the restructuring at the Netherlands Safety Authority. This cooperation is providing useful preparation for the Forth Railway Package.

### Themes for audits, inspections and checks

The themes for audits, inspections and checks are included in Annex 1. They form the basis for the supervision of railway undertakings, the infrastructure manager and training institutes, training centres and medical and psychological centres.

# C. Developments in safety performance

## **C.1** **Detailed analysis of the most recently established trends**

### The number of train-km is rising for goods and passengers

In 2017, 99.95 million train-km were travelled on the Belgian network, 13.7 million of which related to freight, 85 million to passengers, and 1.3 to other purposes.

From 2011 to 2013 there was a decrease of 4% and therefore we had years with a stable number of train-km up until 2016. In 2017, the number increased significantly, namely by 3%, 4.65% of which related to freight traffic and 2.4% to passenger traffic. The sharp fall in the number of social action days (from 13 to 2) may provide an explanation for this, in particular as regards passenger traffic.

### SIGNIFICANT ACCIDENTS

The total number of significant accidents has fluctuated greatly since 2011. The 2017 figures is 50% higher than the 2016 figures, namely 33 in 2017 compared with 22 in 2016, largely attributable to an increase in accidents involving people and stock in motion:

* 1 collision;
* 2 derailments;
* 1 other accident;
* 12 accidents on level crossings;
* 17 accidents involving people and rolling stock in motion (7 in 2016).

Including:

* Derailment of a passenger train in Leuven on 18/2/2017;
* Derailment of a freight train in Aubange on 1/5/2017;
* An accident at a level crossing in Morlanwelz, followed by an accident involving people in Morlanwelz and a collision in Bracquegnies on 27/11/2017.

*Figure1: Number of significant accidents*

|  |  |
| --- | --- |
| Significante ongevallen | Significant accidents |
| andere | other |
| brand in rollend materieel | fire in rolling stock |
| ongeval met personen door bewegend rollend materieel | accident involving people caused by rolling stock in motion |
| ongeval op overwegen | accident on level crossings |
| ontsporing | derailment |
| botsing | collision |

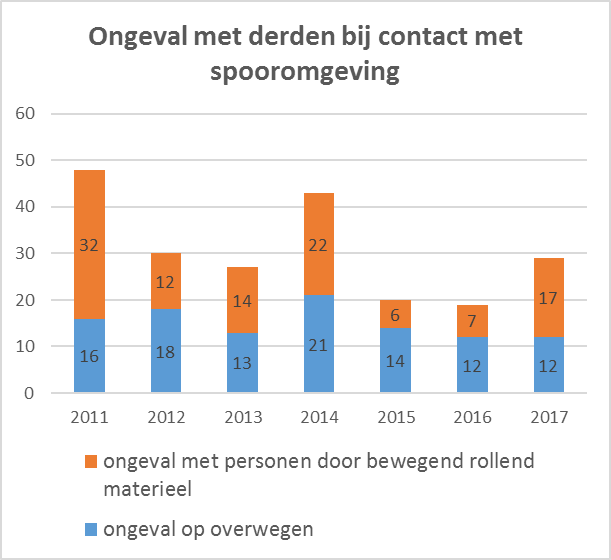
In 2017, 12 accidents occurred at level crossings. This number is exactly the same as in 2016. In no case was the accident attributable to malfunctioning of the infrastructure manager's installations; in many cases the underlying cause was the careless or negligent conduct of users. The most recent accident was that in Morlanwelz on 27 November. In the aftermath of that accident a further collision with a passenger train and an accident involving people (Infrabel employees) occurred. These 3 related accidents thus account for 10% of the accidents in 2017.

The accidents involving people concerned, in addition to track walking which accounts for half of this type of accident, accidents relating to work sites and dangerous conduct on platforms. The distribution is similar to that for 2016 but the total amount is more than double.

|  |  |  |  |
| --- | --- | --- | --- |
| accidents involving people | | 17 |  |
| works |  | 5 | 29% |
| platform |  | 3 | 18% |
| other |  | 9 | 53% |

*Figure 2: Accidents involving people, by situation*

As stated in previous annual reports, the figures are affected primarily by accidents at the interface between the railway system and the outside world. Like last year, they account for almost 9 out of 10 accidents. In total, 6 accidents are related to works. That is almost 1 on 5. Both aspects remain an area of focus for reducing the risks.



*Figure 3: Number of accidents involving third parties*

|  |  |
| --- | --- |
| Ongeval met derden bij contact met spooromgeving | Accident involving third parties on contact with rail environment |
| ongeval met personen door bewegend rollend materieel | accident involving people caused by rolling stock in motion |
| ongeval op overwegen | accident on level crossings |

### Fatalities and serious injuries

The significant decrease in 2015 in the number of casualties was not maintained in 2016 and 2017. There has been a significant increase in the number of deaths, namely up from 14 to 20 in comparison with 2016. We are seeing an increase in all categories other than passengers, where there has been a decrease of 2 to 1. As regards serious injuries, there has been a fall of 9 to 3 in the case of passengers. The number of casualties in the case of passengers is thus much higher than in the period prior to 2016, where this number was much lower and there was no loss of life.

There a major differences in terms of development within the categories of casualties (deaths and serious injuries together):

|  |  |  |
| --- | --- | --- |
|  | 2016 | 2017 |
| Employees | 2 | 9 |
| Level crossing users | 12 | 12 |
| Passengers | 11 | 4 |
| Trespassers on the tracks | 5 | 11 |
| Others, passengers near or on the platform | 3 | 3 |
| Total | 33 | 39 |

*Figure 4: Casualties by category*

*Figure 5: Number of casualties*

|  |  |
| --- | --- |
| slachtoffers | casualties |
| gewonden | injuries |
| sterfgevallen | deaths |

The efforts made by the infrastructure manager, namely awareness campaigns on the dangers of walking on and near the tracks, the technical adjustments involving pedestrian-deterrent paving, which make it more difficult to access critical points on the tracks, and the approved investments each year to remove a number of level crossings and to protect exists ones better, remain considerable.

### Suicides

The development in the number of suicides is connected primarily with social phenomena outside the railway and can be affected to only a limited degree by, for example, technical improvements and other measures to be taken by the infrastructure manager. Following a peak in 2016 (104 suicides and 21 attempts), the level has returned to that of previous years (88 suicides and 14 attempts).

### Dangerous goods (RID)

In 2017, there were, for the third year running, no significant accidents involving the transportation of dangerous goods.

### Precursors to accidents

The number of broken rails halved from 37 to 16. This decrease may be the result of less severe winters, on the one hand, and the new equipment and preventative measures which the infrastructure manager has introduced in recent years, on the other.

In addition, there has been a spectacular decrease in the number of SPADs, down from 91 in 2016 to 55 in 2017.

*Figure 6: Development of SPADs*

|  |  |
| --- | --- |
| Ongeoorloofde seinvoorbijrijdingen | SPADs |

Only 19 of 55 SPADs in 2017 were SPADs where the first danger point was passed. That is 35%. This may be linked to the technical support which train drivers receive as a result of the installation of the TBL 1+ system and an ETCS in rolling stock and infrastructure. However, the development must be analysed over several years before drawing any firm conclusions.

*Figure 7: SPAD danger point (not) passed*

|  |  |
| --- | --- |
| Seinvoorbijrijdingen | SPADs |
| voorbij stoptonend sein, gevaarlijk punt bereikt | signal passed at danger, danger point passed |
| voorbij stoptonend sein, gevaarlijk punt niet bereikt | signal passed at danger, danger point not passed |

In the case of passenger trains the number of SPADs has been halved. As regards freight trains, the downward trend has continued. In respect of Infrabel, the number has also fallen but on account of the overall decrease it now accounts for a third of the total. However, the sector is unable to carry out a clear cause and effect analysis. It therefore remains to be seen whether these favourable results are random or the beginning of a sustainable improvement.

*Figure 8: Number of SPADs per type of transport*

|  |  |
| --- | --- |
| SPAD per type transport | SPAD per type of transport |
| Werken | Works |
| Goederen | Freight |
| Reizigers | Passengers |

### Costs of significant accidents

The costs of accidents in relation to the years 2013 to 2016 (the previous years’ figures are estimates) differ greatly on account of the accidents at level crossings and collisions. Depending on the vehicles involved, they have a very varied impact on the damage and consequently also the financial damage. In 2017, the calculated damage is double that of 2016.

### Technical safety of the installations and their use, safety management

Infrabel manages 3 605 km of railway lines with a total of 6 515 track-km. The technical safety of the infrastructure has increased thanks to the investments made in automatic train protection systems (ATP) and the systematic removal of level crossings.

#### ATB

The percentage of track-km with an automatic train protection system (ATP), including TBL1+, has been 80% since 2015 compared with 65% in 2014.

At the end of 2016, the investment in TBL1 + was completed. At the end of 2016, 74% (or 4 810 track-km) was equipped with the automatic stopping system TBL1+, compared with 62% (or 4 043 track-km) two years earlier.

It is now in operation at the major junctions on the network and, according to Infrabel, covers 99.9% of the risk.

At the end of 2017, 25% of the rail network was equipped with a cab signalling system (ETCS, TBL2 or TVM 430), as against 14.7% three years earlier.

Installation of ETCS will continue in the coming years, but as it will be mainly installed on lines where TBL1+ already exists, the total number of track-km which is protected will no longer increase significantly. However, the degree of protection is increasing.

In 2017, 91.2% of train-km were travelled using some form of ATB. TBL1+ was the most used, accounting for 72.9% of train-km. This figure will increase further in 2018 since on 14 December 2016 the infrastructure manage started to decommission the ‘crocodiles’. This will lead to a rapid decline in the use of the Memor system.

#### Level crossings

The total number of level crossings fell by 13 in 2017 and now stands at 1 737, which is 85% of the number in 2006. Both the number of protected level crossings, 1 503 in 2016, as well as passive level crossings, 234 in 2017, are decreasing year on year. This means that there is still 1 level crossing per 2 km of track.

The proportion of protected level crossings rose from 86% in 2016 to 87% in 2017.

*Figure 9: Number of level crossings*

|  |  |
| --- | --- |
| Overwegen | Level crossings |
| aantal overwegen | number of level crossings |
| overwegen met beveiliging | level crossings with protection |

## **C.2** **Results of the safety recommendations**

During 2017, the Investigation Body for Accidents and Incidents on the Railways (OOIS) informed the DVIS that it had launched 6 investigations in response to accidents or incidents which had occurred in 2017, namely:

* Leuven 18/02 (derailment),
* Aubange 19/05 (derailment),
* Engis 31/7 (collision involving staff),
* Oostende 21/09 (collision involving staff),
* Neufvilles 20/11 (collision involving staff),
* Morlanwelz – Bracquegnies 27/11 (collision involving staff).

In the course of 2017, the DVIS received 3 accident reports from the investigation body.

Seven new recommendations were made in those reports.

* In the report on Buizingen (accident of 10/09/2015), which was published in February 2017, 4 recommendations were made.
* In the report on Melsele (accident of 12/04/2012), which was published in December 2017, no recommendations were made.
* The report on the accident in Hermalle-Sous-Huy (accident of 05/06/2016) was published in December 2017 and 3 of the recommendations were acted upon from the beginning of 2018.

In 2017, the 7 new recommendations were addressed to more than one undertakings: the infrastructure manager Infrabel has to take measures in relation to 2 of the 7 recommendations and the railway undertaking concerned has to take measures in relation to 5 of the 7 recommendations.

During 2017, the DVIS received no investigation reports from investigation bodies of other Member States.

The DVIS supervises the measures which the railway actors take in response to the recommendations that the investigation body addresses to the railway actors concerned in its safety reports. The aim of these measures is to increase the level of safety.

This supervision is carried out by means of periodic bilateral meetings and checking activities. Annex 4 contains a table summarising the recommendations which DVIS acted upon in 2017. Items that were closed are not longer included in the following annual report.

## **C.3** **Measures implemented outside the safety recommendations**

None.

# D. Supervision

## **D.1** **Strategy and plan(s)**

Each year the management discusses the various supervisory activities carried out by the operational divisions to define the priority themes and supervision policy for the following year.

This concerns the areas which must be considered on the basis of information obtained in examining:

* the certification application of a railway undertaking;
* the authorisation application of the infrastructure manager;
* an application for the placing into service of ‘Infrastructure’;
* an application for the placing into service of ‘Rolling Stock’

and also:

* areas to be considered on the basis of the analysis of annual reports of the infrastructure manager and the railway undertakings;
* action on safety level indicators (common safety indicators, compliance with safety targets, etc.);
* recommendations from the investigation body;
* supervisory activities carried out.

The supervisory activities are regularly revised to ensure that they continue to be in line with the factors affecting the level of safety on the network.

To that end, the operational divisions will use their own findings as well as information obtained through ‘safety policy’ activity or from the investigation body, in particular:

* the analysis of annual reports of the infrastructure manager and railway undertakings;
* the recommendations of the investigation body;
* the action on and recording of events affecting the level of safety;
* the analysis of the relevant factors mentioned in the accident reports of the infrastructure manager and railway undertakings.

## **D.2** **Staff**

The DVIS has 5.42 FTE deployed in supervisory activities out of a total of staff of 35.4 FTE. These FTE are calculated on the basis of the tasks carried out and the average workload per task. It was planned to deploy 6.19 FTE, but a shortage of staff and a number of other priority tasks made it necessary to revise the planned activities. Consequently, the DVIS carried out 87.5% of the planned inspections.

## **D.3** **Skills**

There are different areas of focus within the various operational divisions of the DVIS , but technical railway knowledge and knowledge associated with risk analyses and audits form the principal pillars of skills development. The DVIS provides basic training which is offered to each employee as standard. Depending on the background of the new employees and their tasks, they should develop their skills in each of the two pillars to a lesser or a greater degree. This is done by means of mentoring by experienced staff and by training. This training is provided by, for example, the infrastructure manager or the undertakings as they have specific knowledge of the railway world. In 2016, the DVIS set up a skills management system which was developed further in 2017.

As regards the conduct of audits, in 2015 the decision was taken to bring in a consultant for long-term guidance for all staff involved in supervision. This guidance will continue until 2018.

## **D.4** **Decision-making**

The decision-making criteria have remained as they were in previous years. They are based on the principles set out in Regulations 1158/2010 and 1077/2012, and the internal procedures which flow from them.

Each significant stage of a supervisory activity, determined in the internal procedures, is the subject of a report to the management of the division supervising compliance with the regulations and procedures, and also consistency in the classification of non-conformity. This is done before it is formally validated.

No complaints were made by the railway undertakings and the infrastructure manager about the decisions taken during the supervisory activities.

## **D.5** **Coordination and cooperation**

As a result of the signing in 2016 of a cooperation agreement with ACF, the safety authority of Luxembourg, and EPSF, the safety authority of France, exchanges have multiplied, both during the periodic meetings and through targeted correspondence on specific areas.

The safety authority of Germany (EBA) was involved in one of these meetings, which made it possible to take stock of existing cooperation, but also better to understand the organisation of each safety authority.

In order to strengthen cooperation between the three safety authorities, joint supervisory actions were carried out to give employees an opportunity to share their experiences.

In 2017, the quality of the number of exchanges also increased significantly. This is primarily the result of a review exercise carried out in working group to determine how information can be communicated effectively. The main conclusion was that exchanging supervision reports was no longer very productive and that it was better merely to inform the other safety authorities of the established risks which might be of interest to them.

This new approach has since been introduced at the periodic meetings in preparation for the development of supervision plans for 2018. This approach will be assessed in the course of this year.

As every year, the DVIS met with its French, Netherlands and British colleagues of the EPSF, the Office of Rail and Road (ORR) and the Inspectie Leefomgeving en Transport (IL&T) respectively, to exchange information on the Eurostar railway undertaking.

Cooperation with Netherlands colleagues from the Inspectie Leefomgeving en Transport (IL&T) is progressing well. The aim is to conclude a cooperation agreement in 2018. Although this formal agreement is not yet in place, exchanges of information took place in 2017 on a regular basis.

In addition, the DVIS is working with IL&T and EPSF to organise joint audits of the checks on training institutes for train drivers. This applies in particular to training centres which are recognised in different Member States and where there are common interests.

## **D.6** **Findings and measures taken**

In 2017, the supervisory activities were targeted principally at the following areas:

* Management of traffic restrictions

As a consequence of a number of incidents which had occurred in 2016 inspections were carried out to establish whether the various restrictions which the infrastructure manager had imposed on the railway undertakings had been complied with and whether they are properly managed and communicated to the employees concerned. The cases of non-conformity which found were specific in nature and were the subject of specific improvement measures at the railway companies concerned.

* Analysis of incidents and accidents by the railway undertakings

On the basis of the analysis of the incidents or accidents, inspections were carried out to establish how the railway undertakings approach such situations with regard to their employees involved in these events (analysis, measures taken, traceability, etc.). Our attention focussed primarily on the withdrawal of safety functions. The results were generally satisfactory, even though we identified practical difficulties in implementing the measures where an employee works in various railway undertakings.

* Management of an auxiliary undertaking by several railway undertakings

Certain auxiliary undertakings, which do not have the status of railway undertaking, are used simultaneously by several railway undertakings. Inspections were carried out to ensure that this situation is managed correctly in accordance with the requirements of the safety management system of the railway undertaking concerned. The conclusions from the initial inspections are not sufficient for us to make a substantiated judgment. We have decided to extend this action in 2018.

The action relating to the supervision of wagons carrying dangerous goods which do not form part of a train and launched in 2016 was extended in 2017. As a result of this action improvements were identified with regard to the implementation of the software application which the infrastructure manager developed for the railway undertakings. However, we consider that there is still room for improvement and have decided to continue this action in 2018.

In 2016, we introduced a new type of supervisory activity, namely a system audit designed to assess the maturity of a safety management system on the basis of an analysis of 13 management practices. In 2017, we adapted this model to make it compatible with the ‘Agency Management Capability Maturity Model’ that is recommended by the Agency. A system audit was carried out on the basis of this adapted model and the results were rated as more than satisfactory. Our initial experiences of the system audits confirm the importance of such an instrument, which enables possible shortcomings to be identified which we would otherwise have been unable to detect using conformity inspections and on-site checks.

As regards on-site checks, 2017 was marked by a considerable decline in our activities. This is due to the retirement of certain employees, in combination with the difficulties DVIS is experiencing with recruitment.

In 2016, we worked with the sector on drawing up an anomalies catalogue for Belgium. This work was completed in 2017 and the catalogue is available on the DVIS website. We will continue to attach great importance to the adoption of this catalogue by the railway undertakings operating in Belgium. By using the same classification, it would be possible to compare the results of checks and identify trends, which would benefit the sector as a whole.

In 2017, the DVIS continued its inspection visits of track work sites which confirmed the findings of the 2016 campaign, namely that there are breaches of the safety procedures for working with rail cranes. These breaches can give rise to dangerous obstruction of rail traffic on the adjacent tracks or to a train collision with the crane, which naturally do not contribute to the safety at work of staff and contractors.

# E. Certification and authorisation

## **E.1** **Guidance**

### Railway undertakings

Fifteen railway undertakings are permitted to operate in Belgium, 6 Belgian companies with a Part A and Part B safety certificate issued by the DVIS and 9 foreign undertakings with only Part B issued by the DVIS. No qualitative change is foreseen in the short term. In 2017, 3 Part A and 6 Part B certificates were issued or renewed.

As has been established in previous years, the maturity of the safety management system varies greatly from railway undertaking to railway undertaking. This situation has unfavourable consequences for the planning of resources of the DVIS division concerned since the relationship between guidance for the railway undertaking in its certification process and the formal assessment of the application can vary considerably.

### Training and psycho-medical centres

In Belgium the following institutions were recognised by the safety authority in accordance with the provisions of Train Drivers Directive 2007/59/EC:

* 1 psycho-medical centre.
  + This centre is authorised to carry out the medical and psychological examinations required to obtain a European train driver’s licence.
  + At the end of 2 new centres submitted an application to be recognised a psycho-medical centre.
* 5 training centres for train drivers (basic and specific training and language training).
  + One of these centres was recognised according to the principle relating to the extension of safety certificate B.
  + One of these centres only one has recognition in relation to Belgium for certifying specific knowledge of infrastructure, in addition to the recognition which that centre has obtained in other Member States.
  + One of these centres only has recognition in Belgium for certifying train drivers’ linguistic knowledge.
* 52 examiners for examining the train drivers’ professional knowledge.

### European train drivers’ licence / National register of licences

The number of applications for a European licence in 2017 was considerably higher than in 2016. In 2017, the DVIS issued 426 new licences and 53 duplicates and amended 156 licences. This increase can be explained in part by the large number of new recruits at NMBS/SNCB and the fact that the transition period is gradually coming to an end.

In addition, there were still 139 old licences in circulation on 31 December 2017. These old licences can be exchanged for a European licence until 28 October 2018 at the latest. Under Directive 2007/59/EC, 28 October 2018 is to be the expiry date for all national licences.

On 31 December 2017, around 98% of the train drivers in Belgium held a European licence, which are registered in the national register of licences. The graph below shows the development in the issuing of licences from 2011 to the present day.

*Figure 10: Development in the number of European licences*

|  |  |
| --- | --- |
| EUROPESE VERGUNNINGEN | EUROPEAN LICENCES |

### Rolling stock

In 2017, there were 28 authorisations for the placing in service of rolling stock issued or renewed as the result of a change. Annex 3 provides an overview of the authorisations for placing in service and also an overview of the number of railway vehicles registered as active in the Belgian National Vehicle Register on 1 January 2018.

The national vehicle register contains the European Vehicle Number (EVN) and all the administrative data of a vehicle registered (and thus authorised) in Belgium.

The administrative data:

* EVN (European vehicle number): unique number of 12 digits
* Previous EVN
* If available: serial number
* Status of registration
* Year of manufacture
* Owner
* Keeper
* ECM
* Reference to the authorisation type
* Member States where the vehicle is recognised

## **E.2** **Contracts with other national safety authorities**

***Railway undertakings***

In 2017, no certification application was examined together with other safety authorities.

However, it is clear that there are frequent exchanges between the safety authorities on specific matters which are raised when examining certification applications. This is a positive for the safety authorities which can thus share their experiences and benefit from their foreign colleagues’ knowledge of particular railway undertakings.

### Training institutes

The training centre for train drivers, which is recognised by the Netherlands and the Belgian safety authorities, was audited for the third time in 2017 in collaboration with colleagues from the Netherlands. This resulted in an audit report with only a few recommendations from the DVIS. The joint audit creates a climate in which the training centre is able to develop a management system and processes which are acceptable to the various safety authorities and comply with the various national laws. For us too as a safety authority, such collaboration is an instructive process, both in terms of the approach taken by colleagues and the way in which the different recognitions are managed by the training centres.

French colleagues took part as observers in the audit which we carried out at a foreign training centre. That training centre had already submitted an initial application to be recognised in France. This collaboration went very smoothly and resulted in a number of very pertinent comments regarding the transition between various regulations between the three countries concerned and Eurotunnel.

### Rolling stock

As part of the preparations for the Fourth Railway Package, almost all ongoing projects for vehicle authorisations, the delivery of which is planned after 15/6/2019, are being dealt with in consultation with the Agency and the other safety authorities concerned. To that end, consultation meetings on a regular basis are planned with all the parties involved a project.

In order to gain a better insight into the course of the authorisation procedures, the Agency has selected 18 projects (‘learning cases’) where they follow these ongoing projects. Belgium is involved in 5 ‘learning cases’, namely:

* changes to the THI Factory PB(K)A high-speed train;
* additional authorisation for the Siemens Vectron X4E locomotive;
* additional authorisation of Deutsche Bahn Velaro D high-speed train;
* initial authorisation of the new Stadler Spain Eurodual locomotive;
* initial authorisation of the new Bombardier and Alston M7DD double-decker coaches.

E.3 Procedural problems

None.

E.4 Responses

At present, there are no formal mechanisms for the railway undertakings and the DVIS has not yet identified a need for them. The DVIS does envisage examining a certification application on the basis of a constructive exchange which enables both the railway undertaking and the safety authority openly to discuss matters in dispute. This approach requires frequent contacts with the railway undertaking and clear and precise arguments and grounds from the safety authority, but has the advantage that it makes the railway undertaking recognise the improvements which it has to make to its application. This exchange enables the safety authority to improve its communications to the railway undertakings and to ask questions of itself on a regular basis. If the railway undertaking considers that the decision of the DVIS is not relevant, it is always free to challenge it in court. No action was brought in 2017.

# F. Changes to the legislation

## **F.1** **Railway Safety Directive**

* Legislation in force implementing the Railway Safety Directive;
* Status of the implementation of the changes to the Railway Safety Directive at the end of the reporting year (Annex 5).

## **F.2** **Significant changes to legislation and regulation**

See Annex 5.

# G. Application of the common safety method for risk evaluation and assessment

## **G.1** **Experience of the national safety authority**

Deciding whether or not to apply the common safety method for risk evaluation and assessment (‘CSM 402/2013’) is a difficult exercise for the undertakings. When applying CSM 402/2013 it is often very difficult for the undertakings to describe the change properly. Determining whether or not a change is significant is also difficult.

An undertaking does not use only the 6 criteria set out in Article 4 of CSM 402/2013 to determine whether a change is significant. These 6 criteria are used by the undertaking to decide whether the change concerns a significant ***risk***. In accordance with the NAB/RB Training Workshop in Valenciennes organised by the Agency in April 2016, following the application of the 6 criteria set out in Article 4 the two questions below are asked to determine whether or not a change is significant:

* *‘Is associated risk already controlled and thus acceptable?*’
* ‘*Can risk be managed by well known measures?’*

Only where the answer to both the above questions is ‘no', is the final conclusion that the ***change*** is significant.

Although the two additional questions for determining the significance of a change were presented by the Agency itself during a working group, they are little known to the undertakings. Asking these two questions after applying the 6 criteria set out in Article 4 means that the answer to these 6 criteria from the CSM in practice actually no longer has any bearing on the determination of the significance of the change. As regards changes to the structural subsystems, the criteria set out in Article 4 are always applied by the infrastructure manager. The results of this assessment are presented to the national safety authority, which decides whether or not a new authorisation to place the altered subsystem in service is necessary.

In the event of an authorisation for the placing in service of rolling stock and fixed installations, the DVIS always requests the application also of the CSM as proof of the safe integration of the subsystem into the railway system, in particular where this integration is not safeguarded adequately by the TSI and national rules, as is often the case with the CCS subsystem.

## **G.2** **Feedback from stakeholders**

Most undertakings list only the changes whose significance they have determined. Others report that they did not apply the CSM in 2017 or that there were no significant changes in 2017. Some railway undertakings, on the other hand, provide substantive feedback on the basis of their own experiences.

Feedback from railway undertaking 1

*Under Regulation 402/2013 (Article 18), each railway undertaking and each infrastructure manager is to report on its experience with the application of the regulation. To date, the railway undertakings have received no feedback on this. This makes it impossible to compare the application of the CSM between the railway undertakings.*

*In the experience of the railway undertaking it is difficulty to determine precisely the significance of the change. Where the change is significant, the railway undertaking must consult an assessment body. Choosing an assessment body remains the responsibility of the railway undertaking, which sometimes has little experience with this.*

*Consulting an external body does not necessarily meet the needs of the railway undertaking (specifications difficult to establish, very limited choice among the assessment bodies, extra costs) and does not necessarily provide the relevant clarity as regards the change to be analysed.*

*The railway undertaking prefers a formal procedure being applied for accepting exported risks. Such a procedure already exists between the railway undertaking and the ECM. With manufactures such a procedure is contractually enforced. In 2017, such a procedure was developed between the railway undertaking and the infrastructure manager.*

*The railway undertaking would welcome support from the DVIS and/or the Agency to assess the significance of the change. Another possibility would be to publish a reference framework for changes. In the meantime, the railway undertaking uses its own standards: it refers to specific cases which involve a clear and significant change.*

Feedback from railway undertaking 2

*In the context of the application of this CSM, wherever any change is made to a document (not only procedures but also registration forms etc.) a registered check is applied to determine whether or not further conduct of the procedure is necessary.*

*The railway undertaking finds it a difficult exercise to determine the extent to which further investigation is necessary as the term safety-critical / impact on safety is a broad one.*

*The railway undertaking applies a conservative strategy to changes initially involving implementation of the amended legislation / regulation and adaptation of its document structure, with no fundamental changes.*

*In case of doubt, a more extensive investigation is carried out.*

Feedback from railway undertaking 3

*The application of CSM 402/2013 proved to be a difficult exercise, and it still is. The Agency's guidance is found to be difficult to understand and unclear. A sort of handbook clearly stating what documents are expected point by point in the guidance would clarify matters a great deal, as would a prescribed format for processes and procedures. Consequently, the choice was made to work together with the DVIS to get to the bottom of the European legislation and to come up with a sound safety management system which is easy to audit.*

*In the meantime, guidance is available on the DVIS website and that guidance clarifies a great deal.*

Feedback from railway undertaking 4

*As regards the application of CSM 402/2013, we are of the opinion that this method can be used simply as soon as the two pillars have been correctly established and managed. This concerns the decision matrix for determining the significance of the change and checking the risk register to establish whether all risks are managed.*

*As soon as these pillars are functional, it is easy to carry out a preliminary analysis of the changes which impact on the undertaking.*

*On the other hand, the obligation to consult an independent assessment body for validation of our analysis process creates an obstacle. This service, which is provided by the independent assessment body, must be paid for and the cost is quite considerable.*

*This can be an obstacle for small undertakings which do not have substantial funds and this could affect the decision on the significance of the change.*

*Having a recognised assessor within the undertaking would be an alternative to the obligation to consult an assessment body. However, the steps to be taken for recognition are complex and there will always be a problem with regard to the independence of that assessor's decision.*

*In short, we consider that this common safety method can lose its effectiveness as a result of the simple fact that the analysis carried out by the independent assessment body must be paid for and the rates charged are very high, and this prevents some undertakings from applying this method correctly.*

## **G.3** **Revision of the national safety rules to take account of the EU regulation on the common safety method for risk evaluation and assessment**

None.

# H. Derogations relating to the ECM certification system

Not applicable to the DVIS.

In Belgium, the certification of the entities in charge of maintenance (ECMs) is entrusted to bodies accredited (by BELAC) for product certification (in accordance with the standard EN ISO/CEI 17065). To date, Belgorail is the only Belgian body authorised to certify ECMs.

# Abbreviations

|  |  |
| --- | --- |
| ACF | Administration des Chemins de Fer (NSA LU) |
| ATP | Automatic Train Protection |
| Agency | EUAR |
| CCS | Control Command and Signalling |
| CSI | Common Safety Indicator |
| CTSA | Channel Tunnel Safety Authority (NSA Channel Tunnel) |
| DB Netz | German infrastructure manager |
| DeBo | Designated Body |
| DMU | Diesel Motor Unit |
| DVIS | Dienst Veiligheid en Interoperabiliteit van de Spoorwegen (NSA BE) |
| FOD MV | Federale Overheidsdienst Mobiliteit en Vervoer |
| EBA | Eisenbahn-Bundesamt (NSA DE) |
| ECM | Entity in charge of maintenance |
| EMU | Electric Motor Unit |
| ERAIL | European Railway Accident Information Links |
| EPSF | Etablissement Public de Sécurité Ferroviaire (NSA FR) |
| EUAR | European Union Agency for Railways (formerly ERA, European Railway Agency) |
| ERTMS | European Railway Traffic Management System |
| ETCS | European Train Control System |
| CSI | Common Safety Indicator |
| CSM | Common Safety Method |
| CST | Common Safety Target |
| IM | Infrastructure Manager |
| IL&T | Inspectie Leefomgeving en Transport (NSA NL) |
| MS | Member State |
| MoU | Memorandum of Understanding |
| NIB | National Investigation Body |
| NoBo | Notified Body |
| NRV | National Reference Value |
| NSA | National Safety Authority |
| NSR | National Safety Rule |
| NVR | National Vehicle Register |
| OOIS | Onderzoeksorgaan voor Ongevallen en Incidenten op het Spoor (NIB BE) |
| ORR | Office of Rail and Road (NSA UK) |
| OTM | On Track Machine |
| RFC | Rail Freight Corridor |
| SPAD | Signal Passed At Danger |
| RU | Railway Undertaking |
| TSR | Temporary Speed Restriction |
| SMS | Safety Management System |

# Annex 1: Themes for supervision in 2018

|  |  |
| --- | --- |
| **Railway undertakings** |  |
| System audits | Evaluation of the maturity of the safety management systems on the basis of audits of management practices |
| Inspections | Management of traffic restrictions |
|  | Verification of the effectiveness of actions carried as part of an action plan |
|  | Preventative withdrawal of safety functions by the infrastructure manager |
|  | Management of the same auxiliary undertaking by several railway undertakings |
|  | Commission Regulation (EU) No 1078/2012 of 16 November 2012 |
|  | Risk management during local operational activities |
| ‘Verification of conformity’ | Safety rules in connection with the formation of trains |
|  | Safety staff of the railway undertakings, with the emphasis on the staff of subcontractors |
| **Rolling stock and dangerous goods** |  |
| Inspections | Relationship of the railway undertakings / Entities in charge of maintenance / Keeper in the context of repairs at the station |
|  | Use of FILL-IN and MERLIN |
|  | Information exchanges between the various actors and compliance with the recommendations from the JNS (Joint Network Secretary) in response to the accident at Aubange |
| **Infrastructure manager** |  |
| System audits | Audit forming and functions of the official responsible for the conduct of the works |
|  | Risk management by Infrabel I-TMS |
| Inspections | Re-engineering of points controls maintenance |
|  | Verification of CCS interoperability constituents |
|  | Safety procedures for works which could intrude into the type II clearance gauge |
|  | Checks on work sites |
|  | Communication of safety instructions within Infrabel |
|  | Evaluation of the application of ‘notice 22’ and other procedures for verification and validation |
|  | Action on applying the EN 50128 standards and in the context of the authorisation for the placing in service of ETCS level 2 with the new SIMIS W (interlocking) protection system |
| ‘Verification of conformity’ | Visibility of signs |
|  | Installation of switchgear and points controls |
|  | Train detection systems |
|  | Checks on work sites |

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| --- | --- |
| **Training institutes, training centres and medical and psychological centres** |  |
| Training institutes, training centres | Ongoing training of the staff in charge of training and of the examiners |
|  | Leadership and organisation, including management systems |
|  | Deviations: procedure and actual checking of applications |
|  | Examinations: peer view and monitoring of the quality of examinations, traceability |
|  | Examinations for train drivers |
| Medical and psychological centres | Acquiring and maintaining railway knowledge |
|  | Leadership and organisation, including management systems |
|  | Calibration of measuring instruments |
| CCR registers | Verification of conformity with regard to Decision 2010/17/EC |
| Application for a European licence via software application | Verification of completeness and conformity with regard to the terms of the agreement between the DVIS and the train undertakings. |
|  |  |

# Annex 2: Common safety indicators (CSI)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Significant accidents broken down by type** | | | | | | | | |
| year | collision | derailment | accident on level crossings | accident involving staff caused by rolling stock in motion | fire in rolling stock | other | total | 1 000 000 train-km |
| absolute number | | | | | | | | |
| 2011 | 0 | 3 | 16 | 32 | 0 | 0 | 51 | 101.3 |
| 2012 | 3 | 2 | 18 | 12 | 1 | 0 | 36 | 99.3 |
| 2013 | 1 | 4 | 13 | 14 | 0 | 0 | 32 | 97.0 |
| 2014 | 3 | 0 | 21 | 22 | 1 | 0 | 47 | 96.6 |
| 2015 | 0 | 1 | 14 | 6 | 0 | 0 | 21 | 96.7 |
| 2016 | 2 | 0 | 12 | 7 | 0 | 1 | 22 | 97.1 |
| 2017 | 1 | 2 | 12 | 17 | 0 | 1 | 33 | 100.0 |
| relative to million train-km | | | | | | | | |
| 2011 | 0,000 | 0,030 | 0,158 | 0,316 | 0,000 | 0,000 | 0,504 | 101.3 |
| 2012 | 0,030 | 0,020 | 0,181 | 0,121 | 0,010 | 0,000 | 0,363 | 99.3 |
| 2013 | 0,010 | 0,041 | 0,134 | 0,144 | 0,000 | 0,000 | 0,330 | 97.0 |
| 2014 | 0,031 | 0,000 | 0,217 | 0,228 | 0,010 | 0,000 | 0,486 | 96.6 |
| 2015 | 0,000 | 0,010 | 0,145 | 0,062 | 0,000 | 0,000 | 0,217 | 96.7 |
| 2016 | 0,021 | 0,000 | 0,124 | 0,072 | 0,000 | 0,010 | 0,227 | 97.1 |
| 2017 | 0,010 | 0,020 | 0,120 | 0,170 | 0,000 | 0,010 | 0,330 | 100.0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fatalities by category of persons concerned** | | | | | | | | |
| year | passengers | employees | level crossing users | trespassers | others | total | 1 000 000 000 passenger-km | 1 000 000 train-km |
| absolute number | | | | | | | | |
| 2011 | 0 | 2 | 8 | 15 | 2 | 27 | 10.8 | 101.3 |
| 2012 | 0 | 1 | 13 | 3 | 1 | 18 | 10.9 | 99.3 |
| 2013 | 0 | 0 | 6 | 9 | 0 | 15 | 10.9 | 97.0 |
| 2014 | 0 | 1 | 11 | 9 | 1 | 22 | 11.0 | 96.6 |
| 2015 | 0 | 0 | 11 | 2 | 1 | 14 | 10.6 | 96.7 |
| 2016 | 2 | 1 | 4 | 4 | 3 | 14 | 10.5 | 97.1 |
| 2017 | 1 | 3 | 9 | 7 | 0 | 20 | 11.3 | 100.0 |
| relative to million train-km | | | | | | | | |
| 2011 | 0,000 | 0,020 | 0,079 | 0,148 | 0,020 | 0,267 | 10.8 | 101.3 |
| 2012 | 0,000 | 0,010 | 0,131 | 0,030 | 0,010 | 0,181 | 10.9 | 99.3 |
| 2013 | 0,000 | 0,000 | 0,062 | 0,093 | 0,000 | 0,155 | 10.9 | 97.0 |
| 2014 | 0,000 | 0,010 | 0,114 | 0,093 | 0,010 | 0,228 | 11.0 | 96.6 |
| 2015 | 0,000 | 0,000 | 0,114 | 0,021 | 0,010 | 0,145 | 10.6 | 96.7 |
| 2016 | 0,021 | 0,010 | 0,041 | 0,041 | 0,031 | 0,144 | 10.5 | 97.1 |
| 2017 | 0,010 | 0,030 | 0,090 | 0,070 | 0,000 | 0,200 | 11.3 | 100.0 |
| relative to billion passenger-km | | | | | | | | |
| 2011 | 0,000 | 0,184 | 0,737 | 1,383 | 0,184 | 2,489 | 10.8 | 101.3 |
| 2012 | 0,000 | 0,092 | 1,197 | 0,276 | 0,092 | 1,658 | 10.9 | 99.3 |
| 2013 | 0,000 | 0,000 | 0,551 | 0,827 | 0,000 | 1,378 | 10.9 | 97.0 |
| 2014 | 0,000 | 0,091 | 1,002 | 0,820 | 0,091 | 2,005 | 11.0 | 96.6 |
| 2015 | 0,000 | 0,000 | 1,040 | 0,189 | 0,095 | 1,324 | 10.6 | 96.7 |
| 2016 | 0,190 | 0,095 | 0,380 | 0,380 | 0,285 | 1,330 | 10.5 | 97.1 |
| 2017 | 0,089 | 0,266 | 0,799 | 0,622 | 0,000 | 1,776 | 11.3 | 100.0 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Serious injuries by category of persons concerned** | | | | | | | | |
| year | passengers | employees | level crossing users | trespassers | others | total | 1 000 000 000 passenger-km | 1 000 000 train-km |
| absolute number | | | | | | | | |
| 2011 | 3 | 1 | 9 | 4 | 5 | 22 | 10.8 | 101.3 |
| 2012 | 1 | 3 | 5 | 5 | 0 | 14 | 10.9 | 99.3 |
| 2013 | 0 | 0 | 6 | 4 | 1 | 11 | 10.9 | 97.0 |
| 2014 | 1 | 5 | 11 | 7 | 3 | 27 | 11.0 | 96.6 |
| 2015 | 0 | 0 | 2 | 2 | 1 | 5 | 10.6 | 96.7 |
| 2016 | 9 | 1 | 8 | 1 | 0 | 19 | 10.5 | 97.1 |
| 2017 | 3 | 6 | 3 | 4 | 3 | 19 | 11.3 | 100.0 |
| relative to million train-km | | | | | | | | |
| 2011 | 0,030 | 0,010 | 0,089 | 0,039 | 0,049 | 0,217 | 10.8 | 101.3 |
| 2012 | 0,010 | 0,030 | 0,050 | 0,050 | 0,000 | 0,141 | 10.9 | 99.3 |
| 2013 | 0,000 | 0,000 | 0,062 | 0,041 | 0,010 | 0,113 | 10.9 | 97.0 |
| 2014 | 0,010 | 0,052 | 0,114 | 0,072 | 0,031 | 0,279 | 11.0 | 96.6 |
| 2015 | 0,000 | 0,000 | 0,021 | 0,021 | 0,010 | 0,052 | 10.6 | 96.7 |
| 2016 | 0,093 | 0,010 | 0,082 | 0,010 | 0,000 | 0,196 | 10.5 | 97.1 |
| 2017 | 0,030 | 0,060 | 0,030 | 0,040 | 0,030 | 0,190 | 11.3 | 100.0 |
| relative to billion passenger-km | | | | | | | | |
| 2011 | 0,277 | 0,092 | 0,830 | 0,369 | 0,461 | 2,028 | 10.8 | 101.3 |
| 2012 | 0,092 | 0,276 | 0,461 | 0,461 | 0,000 | 1,290 | 10.9 | 99.3 |
| 2013 | 0,000 | 0,000 | 0,551 | 0,367 | 0,092 | 1,010 | 10.9 | 97.0 |
| 2014 | 0,091 | 0,456 | 1,002 | 0,638 | 0,273 | 2,460 | 11.0 | 96.6 |
| 2015 | 0,000 | 0,000 | 0,189 | 0,189 | 0,095 | 0,473 | 10.6 | 96.7 |
| 2016 | 0,855 | 0,095 | 0,760 | 0,095 | 0,000 | 1,804 | 10.5 | 97.1 |
| 2017 | 0,266 | 0,533 | 0,266 | 0,355 | 0,266 | 1,687 | 11.3 | 100.0 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dangerous goods and suicide** | | | | | |
| year | accidents involving at least one wagon carrying dangerous goods | such accidents involving the release of dangerous goods | suicide | attempted suicide | 1 000 000 train-km |
| absolute number | | | | | |
| 2011 | 0 | 0 | 101 | 0 | 101.3 |
| 2012 | 2 | 0 | 102 | 0 | 99.3 |
| 2013 | 1 | 1 | 94 | 0 | 97.0 |
| 2014 | 1 | 0 | 97 | 0 | 96.6 |
| 2015 | 0 | 0 | 92 | 18 | 96.7 |
| 2016 | 0 | 0 | 104 | 21 | 97.1 |
| 2017 | 0 | 0 | 88 | 14 | 100.0 |
| relative to million train-km | | | | | |
| 2011 | 0,000 | 0,000 | 0,997 | 0,000 | 101.3 |
| 2012 | 0,020 | 0,000 | 1,028 | 0,000 | 99.3 |
| 2013 | 0,010 | 0,010 | 0,969 | 0,000 | 97.0 |
| 2014 | 0,010 | 0,000 | 1,004 | 0,000 | 96.6 |
| 2015 | 0,000 | 0,000 | 0,952 | 0,186 | 96.7 |
| 2016 | 0,000 | 0,000 | 1,071 | 0,216 | 97.1 |
| 2017 | 0,000 | 0,000 | 0,880 | 0,140 | 100.0 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Precursors to accidents** | | | | | | | | | | |
| year | broken rail | track buckle and other track misalignment | wrong-side signalling failure | signal passed at danger | signal passed at danger when passing a danger point | signal passed at danger without passing a danger point | broken wheel on rolling stock in service | broken axle on rolling stock in service | total | 1 000 000 train-km |
| absolute number | | | | | | | | | |  |
| 2011 | 45 | 21 | 2 | 91 | 0 | 0 | 0 | 0 | 159 | 101.3 |
| 2012 | 52 | 26 | 12 | 75 | 0 | 0 | 0 | 0 | 165 | 99.3 |
| 2013 | 76 | 29 | 4 | 56 | 0 | 0 | 1 | 0 | 166 | 97.0 |
| 2014 | 57 | 6 | 3 | 66 | 0 | 0 | 0 | 0 | 132 | 96.6 |
| 2015 | 35 | 26 | 5 | 92 | 40 | 52 | 0 | 0 | 158 | 96.7 |
| 2016 | 37 | 23 | 7 | 91 | 42 | 49 | 0 | 0 | 158 | 97.1 |
| 2017 | 16 | 26 | 8 | 55 | 19 | 36 | 1 | 0 | 106 | 100.0 |
| relative to million train-km | | | | | | | | | | |
| 2011 | 0,444 | 0,207 | 0,020 | 0,899 | 0,000 | 0,000 | 0,000 | 0,000 | 1,570 | 101.3 |
| 2012 | 0,524 | 0,262 | 0,121 | 0,756 | 0,000 | 0,000 | 0,000 | 0,000 | 1,662 | 99.3 |
| 2013 | 0,784 | 0,299 | 0,041 | 0,577 | 0,000 | 0,000 | 0,010 | 0,000 | 1,711 | 97.0 |
| 2014 | 0,590 | 0,062 | 0,031 | 0,683 | 0,000 | 0,000 | 0,000 | 0,000 | 1,366 | 96.6 |
| 2015 | 0,362 | 0,269 | 0,052 | 0,952 | 0,414 | 0,538 | 0,000 | 0,000 | 1,635 | 96.7 |
| 2016 | 0,381 | 0,237 | 0,072 | 0,937 | 0,433 | 0,505 | 0,000 | 0,000 | 1,627 | 97.1 |
| 2017 | 0,160 | 0,260 | 0,080 | 0,550 | 0,190 | 0,360 | 0,010 | 0,000 | 1,061 | 100.0 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cost of significant accidents** | | | | | | |
| year | number of deaths | number of serious injuries | cost of material damages to rolling stock or infrastructure | cost of delays as a consequence of accidents | total cost | 1 000 000 train-km |
| million € | | | | | | |
| 2011 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 101.3 |
| 2012 | 29,502 | 3,486 | 1,271 | 0,441 | 34,700 | 99.3 |
| 2013 | 24,585 | 2,739 | 6,352 | 0,538 | 34,214 | 97.0 |
| 2014 | 36,058 | 6,723 | 0,070 | 0,296 | 43,147 | 96.6 |
| 2015 | 22,946 | 1,245 | 0,137 | 0,141 | 24,469 | 96.7 |
| 2016 | 22,946 | 4,731 | 0,168 | 0,132 | 27,677 | 97.1 |
| 2017 | 43,560 | 6,278 | 3,527 | 0,000 | 53,365 | 100.0 |
| relative to million train-km | | | | | | |
| 2011 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 101.3 |
| 2012 | 0,297 | 0,035 | 0,013 | 0,004 | 0,350 | 99.3 |
| 2013 | 0,253 | 0,028 | 0,065 | 0,006 | 0,353 | 97.0 |
| 2014 | 0,373 | 0,070 | 0,001 | 0,003 | 0,446 | 96.6 |
| 2015 | 0,237 | 0,013 | 0,001 | 0,001 | 0,253 | 96.7 |
| 2016 | 0,236 | 0,049 | 0,002 | 0,001 | 0,285 | 97.1 |
| 2017 | 0,436 | 0,063 | 0,035 | 0,000 | 0,534 | 100.0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Technical safety - automatic train protection ATP** | | | | | | | |
| year | ATP, TBL1+ excluded | TBL1+ | ATP, TBL1+ included | track-km | percentage of train-km using tracks equipped with ATP, TBL1+ excluded | percentage of train-km using tracks equipped with ATP, TBL1+ included | 1 000 000 train-km |
| 2008 | 6% | 0% | 6% | 6282 |  |  |  |
| 2009 | 7% | 11% | 17% | 6426 |  |  |  |
| 2010 | 7% | 18% | 24% | 6344 |  |  | 100.7 |
| 2011 | 7% | 26% | 33% | 6344 |  |  | 101.3 |
| 2012 | 9% | 34% | 43% | 6446 |  |  | 99.3 |
| 2013 | 13% | 51% | 54% | 6472 |  |  | 97.0 |
| 2014 | 15% | 62% | 65% | 6522 |  |  | 96.6 |
| 2015 | 23% | 74% | 80% | 6514 | 12% | 88% | 96.7 |
| 2016 | 24% | 74% | 80% | 6511 | 18% | 87% | 97.1 |
| 2017 | 25% | 74% | 80% | 6515 | 18% | 91% | 100.0 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Technical safety - crossings** | | | | | |
| year | number of level crossings | level crossings with protection | percentage of level crossings with automatic or manual protection | km of track | number of level crossings per km of track |
| 2006 | 2037 | 1613 | 79% | 6212 | 0,328 |
| 2007 | 1957 | 1581 | 81% | 6212 | 0,315 |
| 2008 | 1929 | 1562 | 81% | 6282 | 0,307 |
| 2009 | 1913 | 1569 | 82% | 6426 | 0,298 |
| 2010 | 1902 | 1560 | 82% | 6344 | 0,300 |
| 2011 | 1879 | 1595 | 85% | 6344 | 0,296 |
| 2012 | 1857 | 1590 | 86% | 6446 | 0,288 |
| 2013 | 1848 | 1581 | 86% | 6472 | 0,286 |
| 2014 | 1818 | 1554 | 85% | 6522 | 0,279 |
| 2015 | 1773 | 1530 | 86% | 6514 | 0,272 |
| 2016 | 1751 | 1514 | 86% | 6511 | 0,269 |
| 2017 | 1737 | 1503 | 87% | 6515 | 0,267 |

# Annex 3: Vehicles

### Overview of new and modified vehicles

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name of vehicle type | Vehicle category | Authorisation No | Authorisation category | Description of change(s) |
| Series 41 railcars | Traction unit | BE51 2017 0002 ed.1 | Upgrade | ETCS and TBL1+ version 1.2.9 |
| Series 41 railcars | Traction unit | BE51 2017 0007 ed.1 | Upgrade | ETCS and TBL1+ version 1.2.11 |
| TRAXX F140MS, variant KF (D-A-B-NL) | Locomotive | BE51 2017 0004 ed.1 | Upgrade | New SW version 9.0 with ETCS and TBL1+ |
| TRAXX F140MS, variants KL/KL2 | Locomotive | BE51 2017 0005 ed.1 | Upgrade | New SW version 9.0 with ETCS and TBL1+ |
| TRAXX F140MS, variant KF4 | Locomotive | BE51 2017 0010 ed.1 | Upgrade | New SW version 9.3 with ETCS and TBL1+ |
| TRAXX F140MS, variants KL/KL2 | Locomotive | BE51 2017 0005 ed.2 | Upgrade | Adapting of conditions for use |
| Class 66 diesel-electric loco | Locomotive | BE51 2017 0012 ed.1 | Upgrade | New SW version 5.2.7.0 with ETCS |
| TRAXX F140DESE (D-B-NL) | Locomotive | BE51 2017 0011 ed.1 | Upgrade | New SW version 8 with ETCS and TBL1+ |
| TRAXX F140MS, variant KF4 | Locomotive | BE51 2017 0013 ed.1 | Upgrade | New SW version 9.3 with ETCS and TBL1+ |
| TRAXX F140MS, variants KF3/KF4 | Locomotive | BE51 2017 0017 ed.1 | Locomotive | New SW version 9.3 with ETCS and TBL1+ |
| Series 3000 locomotives | Locomotive | BE51 2017 0001 ed.1 | Upgrade | ETCS equipment |
| ES900 Autorail overhead line maintenance | Special vehicle | BE54 2017 0004 ed.1 | First | First authorisation for Belgium |
| UNIMAT 08-475-3S | Special vehicle | BE54 2017 0003 ed.1 | Upgrade | TBL1+ equipment |
| Diesel-electric loco DE6400/6500 | Locomotive | BE51 2017 0016 ed.1 | Upgrade | TBL1+ equipment |
| Velaro e320 high-speed train | Traction unit | BE51 2015 0004 ed.2 | Additional | First authorisation for Belgium |
| ES64U4-H/H1 (HLE 18/19 NMBS) | Locomotive | BE51 2016 0006 ed.3 | Upgrade | New SW version F1.9.1 |
| Velaro e320 high-speed train | Traction unit | BE51 2017 0018 ed.1 | Additional | First authorisation for Belgium |
| M6 Bx double-decker driving coach | Driving coach | BE52 2017 0001 ed.1 | Upgrade | New SW version 4.3.15 |
| Cabineradio Funkwerk MESA24 | On-board equipment | BE51 2017 0003 ed.1 | First | First authorisation for Belgium |
| ICE3 high-speed train | Traction unit | BE51 2017 0014 ed.1 | Upgrade | New SW version 18.53 |
| RR48M4 grinder train | Special vehicle | BE54 2017 0002 ed.1 | Upgrade | TBL1+ equipment |
| RR16MS-4 grinder train | Special vehicle | BE54 2017 0005 ed.1 | Upgrade | TBL1+ equipment |
| Euro 4000 diesel-electric loco | Locomotive | BE51 2017 0006 ed.1 | Additional | First authorisation for Belgium |
| Thalys PBA high-speed train | Traction unit | BE51 2017 0008 ed.1 | Upgrade | New SW 7.4.2 |
| Thalys PBKA high-speed train | Traction unit | BE51 2017 0009 ed.1 | Upgrade | New SW 7.4.2 |
| UNIMAT 08-275-3S | Special vehicle | BE54 2017 0001 ed.1 | Upgrade | TBL1+ equipment |
| UNIMAT P&T 08-475-3S | Special vehicle | BE54 2017 0003 ed.1 | Upgrade | TBL1+ equipment |
| WEEDFREE spray train | Special vehicle | BE54 2017 0006 ed.1 | First | First approval for Belgium |

### Number of active railway vehicles registered in the national vehicle register (NVR)

|  |  |
| --- | --- |
| Type | Entered |
| OTM | 164 |
| Auxiliary coaches | 5 |
| DMU | 94 |
| EMU | 761 |
| HST | 11 |
| Diesel loco | 286 |
| Electric loco | 349 |
| Coaches | 1550 |
| Wagons | 13169 |

# Annex 4: Implementation of safety measures in response to safety recommendations

|  |  |  |
| --- | --- | --- |
| Safety recommendation | Safety measure | Status of implementation |
| Remersdaal R1  (accident of 01/10/2013, report published by the national investigation body in December 2014) | The railway sector actors must take an in-depth look at the collision risks resulting from one train overtaking another:  • to determine various factors at play at an organisational, technical and operational level;  • to determine the management and mitigation measures to be taken. | In 2015, the IM included this subject in various working groups.  The analysis of this recommendation was carried out.  At the end of 2016, there was still no consensus within the sector on this item.  The freight operator concerned has adapted its processes so that the problems with the tail lights can be registered and remedied more swiftly. An additional check has also been introduced, namely the status of the battery is also checked during maintenance of the locomotive.  The Safety Authority proposed, in its annual report to the investigation body, that this recommendation be closed. |
| Wetteren R2  (accident of 04/05/2013, report published by the national investigation body in December 2015) | The railway undertakings establish procedures to minimise the risks of reduced alertness of train drivers. | The functionalities of the TBL1+ system were extended to TBL1++ and it is now installed on most equipment.  The functionalities of this version, TBL1++, will be extended further by the NG version, and the new version will probably be operational in 2018.  The implementation of ETCS is being carried out in accordance with the ETCS general plan.  The railway undertaking concerned has developed a ‘risk and fatigue tool’ which takes account of the effect of work schedules. This system is operational in 2017.  Additional research is being carried out into people with sleep problems. |
| Wetteren R3 | The railway undertakings and the infrastructure manager are, as far as possible, taking account of the principle of human error in such a way that a simple error does not immediately result in a disaster and that the identified risks are limited by structural and operational measures. | Ditto R2. |
| Wetteren R4 | The railway undertakings and the infrastructure manager are evaluating their safety management system to develop, in the interim period, between now and the full equipping of the network with ECTS, operational measures that could improve the level of safety. | Ditto R2 and R3. |
| Linkebeek  (accident of 03/11/2014, report published by the national investigation body in December 2015) | Measures to minimise the consequences of reduced adhesion. | The RUs, the IM and the DVIS analysed the recommendations and drew up measures in 2016. Action was commenced in 2016.  In collaboration with the RUs, the IM also carried out a risk analysis of the adhesion problem.  A procedure was developed to transfer the information available on the rolling stock to the IB's Traffic Control Service more swiftly. The new working method makes it possible to place the issues on the agenda of the bilateral consultation meetings with the IM and systematically develop a solution.  The IM has developed a system for improving the monitoring of actions to clean the tracks and manage the vegetation along them.  The IM is adapting its procedures to obtain feedback more swiftly from the executive services so that it can act more swiftly.  Finally, the IM is also organising a multi-disciplinary risk analysis with the RUs. The result of that are not yet known. |
| Binche  (accident of 13/01/2016, report published by the national investigation body in July 2016) | Improvement of the procedure for validating changes to signalling. | The IM carried out an analysis to establish how certain procedures can be linked and/or information can be shared with the aim of enhancing performance.  The IM has mapped the sub-processes and will clarify the instruction. The most recent version of the ‘notice 22’ regulation is available in the Marin application. All the staff involved will receive training during the 2016/2017 seminars on signalling. |
| Landen  (accident of 18/02/2016, report published by the national investigation body in October 2016) |  | The RU concerned has examined and adjusted the procedure in its safety management system so that the risks are assessed correctly.  The Safety Authority proposed, in its annual report to the investigation body, that this recommendation be closed. |
| Schaarbeek  (accident of 10/10/2014, report published by the national investigation body in November 2016) | Improving the procedure for reporting unsafe conditions.  Aligning coordination and planning in relation to implementation of ETCS. | The RU concerned and the IM are investigating the possibility of optimising the reporting channel.  The IM and the RUs have subjected the implementation plan to a risk analysis and are organising structural periodical consultation meetings to discuss the issues.  The Safety Authority proposed, in its annual report to the investigation body, that this recommendation be closed. |
| Antwerp  (accident of 01/11/2015, report published by the national investigation body in November 2016) | The RU should adapt all the TRAXX locomotives such as those of the 7D or 7D1 series.  The RU should develop a ‘fatigue risk management system’ which is not based solely on strict application of the regulations, but also takes account of driver awareness raising, service planning and the introduction of a detection system for hypovigilance. | The TRAXX locomotives were adapted before the of 2017.  The various topics relating to the occurrence of fatigue or reduced vigilance in driving staff were included in the rules of the Advanced Planning System which is being drawn up. |
| Buizingen  (accident of 10/09/2015,report published by the national investigation body in February 2017) | The RU must, in collaboration with the training centre, raise trainee train drivers' awareness of routine errors.  The infrastructure manager must go over its risk analyses and, where necessary, revise them. | During all forms of training, the RUs and the training centre make use of post-mortem notes to prevent the repetition of accidents. Practice is carried out on a simulator to rehearse rare scenarios.  The infrastructure manager is investigating whether this management is up-to-date. |
| Hermalle  (accident of 05/06/2016, report published by the national investigation body in December 2017) |  | In view of the date of publication of the recommendations, action on these recommendations will commence in 2018. |

# Annex 5: Changes to legislation

### Implementation of the Directive

|  |  |  |  |
| --- | --- | --- | --- |
| CHANGES TO THE RAILWAY SAFETY DIRECTIVE | Implemented (Y/N) | Legal reference | Date of entry into force |
| / | / | / | / |

### Significant changes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LEGLISLATION AND REGULATION | Legal basis | Date of entry into force | Description of the change | Reasons for the change |
| In connection with the National Safety Authority | Law of 3 November 2017 amending the Law of 30 August 2013 on the Railway Code | 21/12/2017 | Clarification of the various provisions concerning the tasks of the safety authority, the fees for its services and the penalties which it can imposed. | Need for harmonisation of the procedures and clarification of some provisions |
| Royal Decree of 14 February 2017 amending the Royal Decree of 22 June 2011 designating the railway safety authority | 13/03/2017 | The aim of this royal degree is principally to incorporate a provision guaranteeing the independence of the SELOR jury which designates members of the board of the Department for Railway Safety and Interoperability, in relation to any railway undertaking or any infrastructure manager. | To comply with a request from the European Commission in connection with EU Pilot 8107/15 ‘Manque d'indépendance du Service de Sécurité et d'interopérabilité des Chemins de Fer’. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Legislation in connection with the NoBo, DeBo, OOIS, and third-party institutions for registration, inspection, etc. | Law of 23 November 2017 amending the Law of 30 August 2013 on the Railway Code | 21/12/2017 | Clarification of the various provisions concerning the tasks of the investigation body, the fees for its services and the penalties which it can imposed | Need for harmonisation of the procedures and clarification of some provisions |
| With regard to the RUs/IM/ECM | Law of 23 November 2017 amending the Law of 30 August 2013 on the Railway Code | 21/12/2017 | Clarification of the various provisions concerning the tasks of the investigation body, the fees for its services and the penalties which it can imposed | Need for harmonisation of the procedures and clarification of some provisions |
| Implementation of other EU requirements (where they relate to railway safety) | Law of 23 November 2017 amending the Law of 30 August 2013 on the Railway Code | 21/12/2017 | Implementation of Commission Directive 2016/882 of 1 June 2016 amending Directive 2007/59/EC of the European Parliament and of the Council as regards language requirements  Reduction of the national safety requirements as regards conductors: abolition of certification by the safety authority | Implementation of Directive 2016/882  Implementation of the plan to reduce national safety requirements with regard to conductors |
| Royal Decree of 21 November 2017 amending Royal Decree of 22 June 2011 on the licence for train drivers and the registers of licences and certificates | 26/01/2018 | Clarification of various provisions concerning licences and certificates | Need for harmonisation of the procedures and clarification of some provisions |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Royal Decree of 2 November 2017 on the transport of dangerous goods by rail, with the exception of explosive and radioactive substances | 7/12/2017 | Implementation of Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods, as regards with the transport of dangerous goods by rail, with the exception of explosive and radioactive substances, as most recently amended by Commission Directive 2016/2309 of 16 December 2016 adapting for the fourth time the Annexes to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods to scientific and technical progress | Implementation of Directive 2008/68/EC |
| Royal Decree of 26 October 2017 amending the annexes to the Royal Decree of 1 July 2014 adopting the requirements applicable to rolling stock for the use of train paths | 28/11/2017 | Adaptation of the requirements relating to ETCS. | Adaptation in accordance with the ETCS implementation plan. |