

### ANNUAL REPORT ON RAILWAY SAFETY Belgian National Safety Authority



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## INTRODUCTION

ere you will find the Annual Report on Railway Safety – 2016 by the Department for Railway Safety and Interoperability (DRSI). The DRSI is the Belgian National Safety Authority. This report provides an overview of the development of rail safety in 2016. It implements 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 concerning the Railway Code.

The report is structured as recommended by the European Railway Agency (ERA). It deals with the following subjects:

a) railway safety development, including the Common Safety Indicators (CSI);

b) important amendments to the legislation and regulations regarding rail safety;

c) the development of safety certification and safety authorisation;

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

DRSI provides this report to the ERA, as required by the above-mentioned Directive and to:

- the Minister for the Self-Employed, minister responsible for DRSI;
- the Minister for Mobility, minister responsible for Infrabel and NMBS/SNCB (National Railway Undertaking of Belgium);
- the Special Commission of the Belgian House of Representatives, in charge of examining the safety conditions on the railway network in Belgium;
- the Court of Audit;
- the Investigation Body for Railway Accidents and Incidents (IB);
- the Regulatory Service for Railway Transport and Brussels Airport Operations (the competition authority);
- the Federal Public Service Mobility and Transport (FPS MT);
- the railway sector active 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 provide their annual safety reports to the DRSI by 30 June at the latest. These reports are an important source of information for the present report.

The scope of this report concerns the main lines of the Belgian railway network, including the high-speed lines. The DRSI performs other tasks in addition to the tasks of an NSA. These tasks, imposed by Belgian legislation, concern for example the safety of museum railway lines. These tasks are not specifically referred to in this report.

The organizational structure of DRSI has not changed. In April 2015 the director resigned. Consecutive ad interim directors managed the DRSI until April 2016. At that moment a new director was appointed with a mandate for the following six years. More information on how the DRSI is organised is available on the website.

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

The DRSI hopes you enjoy reading this report.

Reactions are welcome at: nsa@mobilit.fgov.be.





# OVERALL SAFETY PERFORMANCE AND STRATEGY

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### (B) **1.** Main conclusions on 2016

Although in general the numbers for accidents based on the common safety indicators have shown a positive development over the last 6 years, we had 2 collisions in 2016, resulting in 3 persons killed and 10 seriously injured. This means that it is necessary to remain focused on safety. As one of the accidents involved works on rail tracks, this seems, in particular, seems to be a factor that needs attention as it involves a lot of actors that are not rail personnel.

The categories 'accidents at level crossings' and 'collisions with persons on the railway tracks' have improved a lot in 2015 and 2016, after a catastrophic year in 2014. These accidents are caused by external factors that are hard to influence by the railway companies and the infrastructure manager, and which are particularly unstable. And yet the figure for the number of accidents on level crossings (12 in 2016) has fallen under the level of 2013 (lowest figure in previous years) and the figure for collisions with persons (7 in 2016) has only slightly increased compared with 2015 (6, lowest figure for the past five years). In 2016 3 persons got killed in the vicinity of a platform, indicating that perhaps the risks of rail are not well understood by the public.

The number of registrations of precursors of accidents and SPADs remains at the average level of the past five years, with a slight increase with respect to the 2014 figure. A positive factor is that more than half of the SPADs involve SPADs without passing a danger point; they belong to the group of SPADs with the lowest risk of an accident. In 2016 the freight traffic did well in comparison with the previous year, going from 33 to 19 SPADs. Infrabel was responsible for a quarter of all SPADs and saw a growth of the numbers. As the reasons are very often specific for Infrabel, for example in relation to rail works, Infrabel has put in place a programme to make progress.

# (B) **2.** National safety strategy, programmes and initiatives

#### Strategy and plans

The objective of the federal government is a continuous improvement of the safety level on the Belgian railway network. The main concerns are the improvement of safety culture, the safety investments for example in ERTMS and level crossings and dangerous goods.

A national plan for railway safety does not exist. One of the most important levers consists, however, of the public service contracts concluded with Infrabel and NMBS/SNCB and the investment plans linked to these contracts. In the chapter on safety, objectives for plans and achievements are imposed in both cases, although they do not imply obligations for other actors.

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

- Infrabel:
  - plan to concentrate signal cabins: by the end of 2016 there were 86 signal cabins, the plan for the concentration of signal cabins will reduce this number to 10 in 2022;
  - plan to prevent SPADs;
  - plan to prevent accidents at level crossings including investments and initiatives to raise the awareness of the population;
  - plan to prevent trespassing and suicides and projects for a better shielding of railway sites against track walking and similar activities, including raising awareness;

• Infrabel and NMBS/SNCB: master plan for the improvement of the safety on the railway network in Belgium. This plan foresees the quick installation of TBL1+. At the same time as installation of TBL1+, Infrabel worked on an ambitious programme to implement ETCS aimed at equipping all lines of the entire network with some type of ETCS by 2022. From 2025 onwards, ETCS should be the only protection system in operation.

- NMBS/SNCB:
  - adaptation of procedures for departure (DICE);
  - TBL1++ software on rolling stock;
  - plan 2017 TBL1+ (NG) software on rolling stock.

All railway undertakings make efforts to improve safety, particularly by installing the ATP systems.

#### Sector-wide safety consultation meetings

Following the accident in Buizingen in 2010, the initiative was taken to involve the sector as a whole in so called 'safety consultation meetings'. DRSI organises these meetings. They are attended, on average, by 60 representatives of the railway sector and the transport sector. The main objective is to disseminate information and to stimulate discussion on safety topics that are of interest for the sector. The participants are invited to give presentations as a base for these discussions. The FPS MT explains the most recent changes in legislation.

In 2016 the safety meetings took place on the 19th of April and the 13th of October.

### (B) **3.** Assessment of 2016

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

Both for activities of certification and of supervision, DRSI notices that the maturity of the sector in terms of safety is still limited, despite the progress that has already been made.

Concern for safety is all too often seen as a legal obligation with a relatively low return and a negative impact on the available capacity and the use thereof. It would be better if the sector saw safety management as a vital instrument to safeguard the correct functioning of the company and the sector.

In addition, DRSI remarks that the safety management systems still do not meet the expected quality standards. Attention is quite often focused on the operational aspects of safety, without envisioning the entire safety system and management.

#### Rail worksites : interaction and protection of rail traffic

When working on the railway infrastructure, Infrabel must combine both security and track availability constraints.

Taking into account specific safety procedures for working with rail-road cranes, trains are allowed to keep running (at limited speed) along rail worksites. Several inspections on 13 worksites have revealed deviations from the regulations regarding working with cranes. These deviations could lead to dangerous hindering of railway traffic or even accidents like the one occurred in Melsele (in investigation).

It seems that regulations sometimes do not provide clear and unambiguous guidelines with unnecessary overlapping, for example some definitions regarding to the type of intrusion within the track gauge.

Infrabel has agreed to revise and clarify the regulations in the course of 2017, which the NSA will follow up closely.

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

The Infrabel master plan for ETCS is not linked to the roll-out of these systems within the railway undertakings, except for NMBS/SNCB. This implies the risk that the use of the systems and therefore the increased safety is not in pace with the investments in infrastructure.

In order to promote the use of the systems and to increase safety, Infrabel foresees the systematic dismantling of the Memor-Crocodile system on the Belgian railway infrastructure on which ETCS and TBL1+ are installed.

Of course this requires an effort on the part of the undertakings, both in terms of finances and organisation, to equip their traction vehicles with at least one of those 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 obvious. Besides, the undertakings depend on their suppliers for the design and installation of both systems.

The Royal Decree of 1 July 2014, which adopts the requirements applicable to rolling stock using train paths, foresaw that the Memor-Crocodile system on the Belgian railway infrastructure, equipped with the ETCS and TBL1+ systems, would no longer be used from 1 January 2016 onwards. However, as railway undertakings for freight transport were not able to equip their rolling stock with the systems ETCS or TBL1+ in time, the date for taking the Memor-Crocodile system out of service, which was initially set for 1 January 2016, has been postponed at the request of some railway undertakings and their suppliers. The Royal Decree of 18 December 2015 pushed back this date to 12 December 2016.

### (B) **4.** Focus areas for 2017

#### Integration of system audits in the supervision activities

DRSI will integrate system audits into its supervision activities. They look at safety from the perspective of the system contrary to the punctual verification and inspections. To this end the support of a consultant was sought.

#### Continued attention to SPADs

Based on the evolution within the sector further attention will be given to the SPADs both within DRSI and in contact with the sector, in order to gain a better insight into the evolution.

#### Attention for rail worksites

Attention will be given to this subject, which is in other countries also a source of concern.

#### Make better use of the controls of freight trains

Following the 2 working groups that took place in 2016 with the cooperation of a number of railway undertakings, the DRSI will publish a first version of an anomaly catalogue on its website in 2017. The catalogue is intended to support railway undertakings in fulfilling their obligations in the area of safety. The ultimate goal of the DRSI is to collect the results of the inspections carried out by all those involved in freight trains in Belgium in a legible, transparent and straightforward format and to share this - anonymously - with the sector as a whole.

#### Alignment with other NSAs

DRSI will continue to work together with those NSAs for which cooperation exits and take new initiatives if necessary. In this manner DRSI aims at optimising the workload when different countries are involved in a certification or a supervision process. In particular this approach will be recommended to applicants for placing into service of rolling stock in the context of cross-border projects.

#### Topics for audits, inspections and controls

The specific topics for audits, inspections and verifications can be found in Annex 1. They are the basis for the supervision of railway undertakings, the infrastructure manager and training centres and medical and psychological centres.





# DEVELOPMENTS IN SAFETY PERFORMANCE

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# (C) **1.** A detailed analysis of the latest established trends

#### Number of train-km remains stable

In 2016 trains travelled 97.1 million train-km on the Belgian network, of which 13.0 million were for freight, 83.0 million for passengers and 1.3 million for other purposes. This means a modest increase in comparison with 2015, caused by a sharp increase in the number of train-km by Infrabel from 0.288 to 1 million. This increase was due to a change in calculation method.

Whereas from 2011 to 2013 there was a decrease of about 4 %, this decrease has been stopped and since 2013 the figure has stabilised. The conclusions based on absolute figures are therefore also valid for the relative figures if compared with the period starting from 2013.

#### Significant accidents

The total number of significant accidents in the past five years first decreased from 36 in 2012 to 32 in 2013, then it rose again to 47 in 2014 and fell once again to 21 in 2015 and 22 in 2016. The 2015 number is 33.5 % and the number from 2016 is 30.4 % lower than the average over the past five years.



Figure 1: Number of significant accidents

The number of collisions has increased from 0 in 2015 to 2 in 2016 and the number of derailments has decreased from 1 in 2015 to 0 in 2016. No fires in rolling stock were reported in 2016, as in 2015, and one accident was registered in the category 'Other accidents'. One accident reported in 2016 concerned a collision of a train with another train on the 5th of June. This accident caused the death of two passengers and the train driver. 9 persons were seriously injured. The other accident involved a train colliding with a crane that was in use on the other track on the 15th of October. A collaborator working on the tracks got seriously injured.



Figure 2: Number of significant collisions and derailments

19 of the 22 accidents were collisions with persons and vehicles at level crossings (12), with persons who were on or near the tracks (7). The accidents occurring at the interface between the rail system and the non-rail world are caused by factors that are for the most part difficult to manage by the railway undertaking or the infrastructure manager, as they involve awareness and safety culture in general. In spite of this, the infrastructure manager continues to invest in measures for avoid-ing these types of accident, such as optimising level crossings and access to the railway domain. The last two years an improvement can be noticed.

#### Fatalities and serious injuries

The major drop in fatalities in 2015 was maintained in 2016, due to a significant drop in the categories of 'users of level crossings' (4, the lowest ever), but on the other hand there is a slight increase in the 'unauthorized persons on the tracks' in 2016 compared to 2015. These two categories have a significant impact on variations over the last five years.



Figure 3: Number of persons killed

Three accidents with fatal consequences occurred by people falling of the platform or being too close to the edge of the platform (other persons). This could indicate that the risks of a train approaching, even at low speed, and the fact that it cannot stop instantly is not well understood by the public. This could result in a behaviour that includes safety risks, such as walking too close to the edge, sometimes provoked by other passengers that are not paying attention.



Figure 4: Victims

The efforts by the infrastructure manager, with awareness campaigns on the dangers of being on and in the vicinity of the tracks (in 2016 a special ad campaign was aimed as festival goers), the technical adjustments with anti-trespass panels that make it difficult to reach critical points on the tracks and concerted investments every year to replace a number of level crossings and to improve those that remain, have, in 2016, had a positive impact on the figures, however it is not yet possible to explain the sharp fluctuation in the figures.



It is clear that for this type of accidents 2014 was a very bad year. In 2015 and 2016 we see a major improvement. While the development appears hopeful, it is still absolutely not certain that this will continue in the coming years, given the major impact of external factors.





Figure 6: Victims at the interface

For the level crossing accidents, the sum of fatalities and injured is stable over 2015 and 2016 and each figure is lower than the figure in 2013, that was until now the best year. However the number of persons killed on a platform in 2016 has a negative impact on safety levels.

#### **Suicides**

The development of the number of suicides (in 2016, 104 suicides and 21 attempts) is mainly related to social phenomena outside the railway, and is only influenced to a limited extent by, for example, the shielding of the railway area. The number has risen by more than 10 % in comparison to 2015.

#### Dangerous goods (RID)

There were no significant accidents involving dangerous goods transport in 2016 for the second consecutive year.

#### Precursors to accidents other than SPADs

Within these categories a small shift is taking place: the number of broken rails is increasing, the number of track nodes or other deformations is decreasing to approximately the same extent.

After an increase to 76 in 2013, the number decreased to 57 in 2014 and to 35 in 2015. In 2016, there was a slight increase to 37. This fall (2015-2016) could on the one hand be a consequence of the milder winters and on the other hand of the new equipment and preventive measures that the infrastructure manager has taken over the past years.

Over the last five years, the number of track distortions has risen from 26 in 2012 to 29 in 2013, before falling dramatically to 6 in 2014, and rising again to 26 in 2014 and dropping to 23 in 2016. This concerns a parameter that includes all track distortions that give rise to operating restrictions. Consequently this figure corresponds to the average of the previous years. For the exceptionally low figure in 2014, the infrastructure manager has no explanation. In 2016, it will continue the precautionary measures launched in 2013.

The number of signal failures has fallen over the past three years from 12 in 2012 to 4 in 2013, to 3 in 2014 and has risen again to 5 in 2015 and 7 in 2016.

#### **SPADs**

The number of SPADs has fallen over the past five years from 91 in 2011 to 75 in 2012, 56 in 2013, before rising again to 66 in 2014, 92 in 2015 and 91 in 2016.



Figure 7: Evolution of SPADs

42 of the 91 SPADs from 2016 were SPADs that passed the first danger point, the other 49 SPADs were SPADs where the first danger point was not passed. 57 % of the SPADs belong to the group with the smallest risk of an accident. This could be related to the technical support provided by train drivers, by installing the TBL 1 and ETCS system in rolling stock and infrastructure. From the information distributed within the working groups shows that the number of signals passed has not risen, not only on the main lines but on the entire network.



Figure 8: SPADs (without) passing a danger point

Though the number of SPADs remains the same, there are interesting changes concerning who is causing the SPADs. For passenger trains the number remains roughly at the same level. For freight traffic the number of SPADs has fallen considerably. For Infrabel the number of SPADs has risen considerably to a quarter of the total number of SPADs. For signals passed when passing a danger point Infrabel is at 35 % of the total number with 15 SPADs. As these SPADs are usually of a different type than those within normal train operation, Infrabel has, based on the figures of 2016 put in place a program in order to prevent this type of SPAD, especially regarding rail works and putting out of service of tracks.



Methodologically-speaking, there are two concerns regarding the SPADs. In a limited number of cases, there has been a lack of a shared vision on the classification of SPADs. The definition of a SPAD therefore needs refining. In addition, the improved registration by the infrastructure manager has a potential impact on the number of SPADs that are detected and registered.

As mentioned elsewhere, working groups are examining this development and its causes, technical as much as human.

Following the 2010 Buizingen accident, the first reaction of the sector was to roll out a technical solution. The first and most important finding based on the investigation of this accident is indeed that Belgium has a very large delay in the field of automatic train protection (ATP) safety equipment. To resolve this, it was decided in a first phase to install a national ATP system, TBL1+, on a large scale. The roll-out and installation of this system took place between 2010 and the end of 2015 and is currently completed. The number of SPADs found does not seem to be decreasing, and this is due to the delay in the equipping of rolling stock. The vast majority of railway companies were faced with huge waiting times, as manufacturers could not equip locomotives in time. In a second phase, it was decided to start simultaneously equipping the network with ETCS. This is a more sophisticated, more efficient system that is also interoperable. However, it is more expensive and much harder to install as it is more complex. Therefore, the rollout plan was staggered until 2022. Belgium is among the frontrunners in Europe.

Specific to this system is that it is a driver's cab signalling system that continuously monitors the speed of the train. The aim is to prevent SPADs by slowing the train down before it reaches the signal that it has been ordered to stop at. The implementation of this system will normally decrease the number of signals overrun.

Despite the proven effectiveness of these technical systems (several accidents have already been avoided), there appears to be a significant risk that remains. This residual risk is the result of human intervention in all critical activities; this is summarized under the term 'human factors'. The latest findings of the working groups involved in the SPAD analysis seem to indicate that these human factors are becoming increasingly important as the underlying causes of SPADs. The entire sector has been paying particular attention to the identification and approach of these human factors for some time. It is a lever that can produce significant improvements - at least in the short and/or medium term. The 'social media' element seems to play a particular role. Particular attention is required when these

media, the same as in daily life, take on a professional role. For example, apps that are specifically for train drivers are available to help them drive more efficiently. It is important to check the impact of such systems on safety. In addition, the influx of younger employees with less experience plays a role in the increase. Adequate attention should be paid to guidance and training.

#### Costs of significant accidents

The costs of accidents for the years 2013 to 2016 (the figures of previous years are estimates) are very different due to the accidents at level crossings and the collisions. Depending on the vehicles involved, they have a very different impact on the damage and consequently also the financial damage. In 2014 the figure rose by 15.2 % with respect to the 2013 figure, only to fall again by 43.2 % in 2015 and to increase by 14 % in 2016.

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

Infrabel manages 3 602 km of railway lines with a total of 6 511 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.

#### ATP

The percentage of track km with an automatic train protection system (ATP), including TBL1+, was 80 % in 2015 compared to 65 % in 2014. This is the biggest increase since 2008.

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

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



Figure 10: Percentage of infrastructure equipped with ATP

At the end of 2016, 24 % (or 1 563 track km) of the rail network was equipped with a cab signalling system (ETCS, TBL2 or TVM 430), against 14.7 % (or 957 track km) two years earlier. The installation of ETCS will continue in the years ahead, but as it is mainly installed on lines where TBL1+ is already present, the total number of track km which is protected will not significantly rise. The level of protection will, however, be higher.

87.3 % of the train km in 2016 was covered using some form of ATC. TBL1+ was most used, with 68.3 % of the train km. This number will increase further in 2017, as on 14/12/2016 the Infrastructure Manager began taking Crocodiles out of service. This will cause the use of the Memor system to decrease rapidly.

#### Level crossings

The total number of level crossings has fallen by 22 in 2016 and is now 1751, which is 86 % of the number in 2006. Both the number of secured level crossings, 1514 in 2016, as well as passive level crossings, 237 in 2016, decrease year by year.

The proportion of secured level crossings has risen from 86.29 % in 2015 to 86.46 % in 2016.



Figure 11: Evolution of level crossings

### **(C) 2.** Results of safety recommendations

During the year 2016, the Investigation Body for Railway Accidents and Incidents reported to the DRSI that it had started four investigations into accidents or incidents that had taken place in 2016, namely:

- Binche 13/01,
- Landen 18/02,
- Hermalle-Sous-Huy 05/06,
- Melsele 15/10.

In the course of 2016, the DRSI received six accident reports from the investigation body, into investigations started in respectively 2012, 2014, 2015 and 2016:

- Pittem 25/11/2015 (received in July 2016),
- Binche 13/01/2016 (received in July 2016),
- Remersdaal 25/01/2012 (received in Sept 2016),
- Landen 18/02/2016 (received in Oct 2016),
- Schaarbeek 10/10/2014 (received in Nov 2016),
- Antwerpen-Luchtbal 01/11/2015 (received in Nov 2016).

No recommendations were made in the Pittem and Remersdaal investigation reports (publication July and Sept 2016). In the four other investigation reports, ten recommendations were made. Infrabel must act on four of the recommendations, SNCB/NMBS is to take action on four recommendations and the DRSI six recommendations.

For the three reports published in October and November 2016, the follow-up to recommendations will start in 2017.

During 2016, the DRSI has not received a single investigation report from the investigation bodies of other Member States.

The implementation of safety measures in response to these recommendations from the investigation body are listed in Annex 4.

# C 3. Executed measures not connected with the safety recommendations

Null





## **SUPERVISION**

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### ① **1.** Strategy and plan(s)

The management annually discusses the various supervision activities identified by the operational divisions in order to determine the main topics and define the supervision strategy for the next year.

It concerns topics that have to be checked based on information obtained during the assessment of:

- the application for certification of a railway undertaking;
- the application for authorisation of the infrastructure manager;
- a demand for placing into service for 'Infrastructure';
- a demand for placing into service for 'Rolling Stock';

and as well:

- points to be checked based on the analysis of annual reports of the infrastructure manager and railway undertakings;
- follow-up of safety level indicators (common safety indicators, compliance with safety objectives, etc.);
- recommendations from the investigation body;
- supervision activities carried out.

The supervision activities are regularly revised to ensure that they are always in accordance with the elements affecting the safety level of the network.

To do so, the operational divisions use their own findings as well as information generated by safety policy activity or from the investigation body, namely:

- the analysis of annual reports from the infrastructure manager and railway undertakings;
- the monitoring of safety level indicators (common safety indicators, compliance with safety targets, etc.);
- recommendations from the investigation body;
- follow-up and registration of events affecting the safety level;
- the analysis of pertinent elements recorded in the accident reports by the infrastructure manager and railway undertakings.

### (D) **2.** Human resources

DRSI has used 6.59 FTE for activities concerning supervision on a total of 37 employees. The FTE are based on the number of tasks executed and on an average workload per task. It was foreseen to use 7.48 FTE, but other assignments necessitated to reconsider the planned activities. With that, the number of inspection activities executed by DRSI was 94.4 % of the planned inspections.

### (D) 3. Competence

Within the various operational divisions of DRSI the focus varies, but technical knowledge of the railway system and knowledge associated with risk analysis and audits are the main pillars for the development of the competences of the employees. DRSI provides a basic training for each employee. Depending on the background of the new employees and their tasks, they will develop their skills in each of the two pillars to a lesser or a greater extent. This will be done through mentorship by experienced staff and by training. These trainings are provided by, for example, the infrastructure manager or the undertakings, since they have specific knowledge about the railway world. In 2016 a start was made with a competence management system.

Regarding the execution of audits, the decision was made in 2015 to call upon a consultant for guidance over a longer period of time for all staff involved in supervision. This guidance will continue until 2018.

### (D) 4. Decision-making

The decision-making criteria regarding the way the NSA has followed, promoted and enforced the regulatory framework and the procedure for establishing these criteria are based on the principles in the Regulations 1158/2010 and 1077/2012 as well as on the internal procedures that result from these regulations.

Every major stage of a supervision activity, identified through the internal procedures, is the subject of a report to management which checks compliance with regulations and procedures as well as coherence in terms of classification of nonconformities and this prior to validating it formally.

No complaints were submitted by the railway undertakings or infrastructure managers regarding decisions made during the course of monitoring activities.

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

Following signature of a protocol agreement on 6 February 2015 with the NSAs from Luxembourg and France, the Administration des Chemins de Fer (ACF) and the Etablissement Public de Sécurité Ferroviaire (EPSF), an agreement was signed in 2016. The main purpose was to organise supervision activities, for example with railway undertakings or training centres where there is a common interest. In this way, duplication of work is avoided.

In the context of this agreement, the NSAs have decided to hold three meetings per annum. In these meetings the NSAs will deal with the following subjects:

- return of experience of supervision activities conducted jointly;
- themes identified as important in the context of the sharing of good practices and a possible future harmonisation of our procedures;
- NSA strategies;
- monitoring activities carried out;
- points to be checked, based on information received in the assessment of an authorisation or certification procedure;
- points to be checked based on the analysis of annual safety reports;
- the following up of safety level indicators (common and national safety indicators, compliance with safety targets, etc.);
- recommendations from the investigation bodies;
- the follow-up and registration of events affecting the safety level, within the provisions existing at a national level;
- the pertinent elements included in accident analysis or accident reports from railway undertakings;
- the planning of supervision activities in separate periods and thus avoiding, as far as possible, the programming of simultaneous and/or superfluous activities in the same railway undertaking;
- common supervision activities the NSAs could undertake.

Without having signed a formal cooperation agreement, DRSI meets yearly to exchange information about the railway undertaking 'Eurostar' with its colleagues of France, EPSF, and the United Kingdom, the Office of Rail and Road (ORR). IL&T has joined the group within the scope of extension to the Netherlands as requested by Eurostar.

After initial contact in 2015, 2016 has allowed us to work on better collaboration with the NSA of the Netherlands, Inspectie Leefomgeving en Transport (IL&T). The intention is to try to align with what has been developed with the EPSF and the ACF.

### (D) 6. Findings and measures taken

In relation to 2015, we have noticed a slight improvement in how it is taken into consideration that a nonconformity can have an indicator or warning role in relation to points which have not been subject to a check by the NSA. The DRSI will continue to make railway undertakings aware of this subject.

As in 2015, railway undertakings have been subject to inspections and monitoring on site by the DRSI. In addition, 2016 has seen the introduction of the auditing system aimed at determining the maturity level of the various elements constituting the safety management system. Due to this, the inspections are now limited to the conformity aspect of parts of the safety management system. Inspections were carried out that amounted to 94 % of the forecast in the supervision plan. As for the monitoring, this covers safety on site. The number of checks set in the supervision plan was exceeded by 54 %.

The supervision activities concentrated mainly on the following points:

#### Verification of the effectiveness of the management system

Two practical audits on Safety Management were carried out during 2016 with the help of a consultant. The aim of these audits was to evaluate the effectiveness and the maturity level of the safety management system of an RU. It is still premature to draw conclusions considering the small amount of experience in this area, but it already seems that there is not an automatic link between conformity level and level of maturity. This theme will be covered annually, so that all the RUs that are holders of a Part A safety certificate, issued by the DRSI, are audited regularly. The sector has favourably received this new, more collaborative approach.

 Monitoring of dangerous goods wagons not incorporated into a train
 The DRSI carried out inspections aiming at the correct implementation by railway undertakings of a new software application developed by the infrastructure manager and intended to monitor dangerous goods wagons when parking in a railway facility. The results are generally positive and that constitutes a significant advance in terms of the risk management linked to this type of transport.

• **REGULATION (EU) No 1078/2012 OF THE COMMISSION of 16 November 2012** The inspections on internal monitoring, started in 2015 were completed in 2016. The findings were substantially the same as the previous year, namely that despite the presence of monitoring plans, a monitoring strategy is almost systematically lacking and the priorities are almost never set. However, the follow-up to the corrective measures seems to confirm that the railway undertakings are taking the appropriate measures to resolve these nonconformities.

#### Safety personnel from contractors

Our inspections in previous years have shown that there are still numerous problems in the area of certification of personnel carrying out safety functions other than driver, and this mainly for personnel coming from contractors. 2016 has not seen a noticeable improvement in this situation. Our efforts will therefore continue to focus more closely on this category of personnel and on the relationship between railway undertakings / contractors that results from it.

In order to be able to compare the findings made during train inspections, a working group has been started with the aim of setting up an anomaly catalogue for Belgium which is available to all actors carrying out such checks. The starting point is to have a common list based on the Swiss model, whereby everyone uses the same classification. In this way it will be possible to compare the results of the inspections and to determine general trends.

The working group met twice in 2016 and the result will be published on the DRSI website in the course of 2017. A first version of the catalogue will be made up of four lists: freight trains, wagons, wagons for dangerous goods and traction vehicles. Other lists can be added afterwards. The lists themselves will be updated on a regular basis, based on experience and comments from the sector.





## **CERTIFICATION AND AUTHORISATION**

- 1. Guidance p. 30
- 2. Contact with others NSAs p. 31
- 3. Procedural issues p. 31
- 4. Feedback p. 31

### (E) **1.** Guidance

#### Railway undertakings

In Belgium, 15 railway undertakings are allowed to operate on the network, including 7 Belgian companies with Parts A and B issued by the DRSI and 8 foreign undertakings with only Part B issued by the DRSI. A quantitative change is not envisaged in the short term. In 2016, 2 Part A and 5 Part B certificates were issued or renewed.

The DRSI uses a client oriented approach. It appears that the maturity in terms of safety management system differs greatly from one railway undertaking to another. In this context, the ratio between accompanying the railway undertaking in its application for certification and the formal assessment of the application file can vary considerably.

#### Training and Psycho-medical centres

In Belgium, the following bodies were approved by the safety authority in accordance with the requirements of the train driver's Directive 2007/59/EC:

- 1 psycho-medical centre. This centre is authorised to carry out the medical and psychological examinations required for obtaining a European driver's licence.

- 4 training centres for train drivers (basic and specific training). One of these centres was approved according to the principle of extension of the safety certificate B.

- 44 examiners for examining the train drivers' professional knowledge.

#### Rolling stock

In 2016 there were 22 authorisations for rolling stock issued or renewed following an amendment. Annex 3 is an overview of the authorisations for bringing into service and also an overview of the number of railway vehicles registered as active in the Belgian National Vehicle Register on 1 January 2017.

A client-oriented approach is also used for rolling stock.

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

The administrative data:

- EVN (European vehicle number): unique number of 12 digits
- Previous EVN
- If available: serial N°
- Status of registration
- Manufacturing year
- Owner
- Keeper
- ECM
- Ref to type authorization(s)
- · Member states where the vehicle is authorized

The Belgian NVR contains also the EVN of motorized vehicles (with reference to the authorization) that are registered in other member states and that are authorized in Belgium.



Figure 12: Rolling stock NVR

### (E) **2.** Contact with other NSAs

There were no requests in 2016 from other NSAs for information on a Part A certificate belonging to a railway undertaking certified in Belgium which was requesting a Part B certificate in another Member State. There have been no requests made to other NSAs for information on a Part A certificate belonging to a railway undertaking certified in another Member State requesting a Part B certificate in Belgium.

#### Training bodies

The training centre for train drivers, which is recognised by the Dutch and the Belgian NSAs, was audited for the second time in 2016 in collaboration with colleagues from the Netherlands. This resulted in a joint audit report with the recommendations from both NSAs. Through the joint audit and the formulation of advice from both, a climate has been created in which the training centre is able to develop a management system and processes that are accepted by the various NSAs (and the different national legislations). For us as an NSA, such collaboration is a learning-oriented process, both in terms of the approach by colleagues as well as how the different authorisations are managed by the training centres.

#### Rolling stock

The Velaro e320 project was continued with the prospect of implementing the ETCS safety system. The working group met several times and is composed of representatives of the EUAR Agency and the relevant national safety authorities (ORR, CTSA, EPSF, DRSI and ILT).

In view of the approval of the HLE 18/19 locomotive in France, the impact of this project was discussed in a working group composed of representatives of the manufacturer and both relevant national security authorities (EPSF and DRSI). A significant part of the approval aspects for France will be based on the convention on mutual recognition BeNeFLuChE.

### (E) **3.** Procedural issues

Null

### (E) **4.** Feedback

Currently, there is no formal mechanism intended for railway undertakings and the DRSI has not noticed a need for one. The DRSI envisages examining the certification file on the basis of a constructive exchange allowing the railway undertaking as well as the NSA to openly discuss difficult points. This approach requires frequent contact with the railway undertaking as well as a clear and precise argument and justification from the NSA, but with the advantage of allowing the railway undertaking to recognise the improvements necessary to its application file. This exchange also allows the NSA to improve its communication towards railway undertakings and to regularly question itself.

If the railway undertaking considers that our decision is not pertinent, they are invited to submit a legal challenge. No challenge has so far been submitted.





# CHANGES IN LEGISLATION

- 1. Railway Safety Directive p. 34
- 2. Changes in legislation and regulations p. 34

### (F) 1. Railway Safety Directive

- Legislation in force transposing the railway safety directive;
- The status of the transposition of the amendments to the railway safety directive at the end of the reported year (Annex 5).



See Annex 5.





# APPLICATION OF THE CSM FOR RISK EVALUATION AND ASSESSMENT

- 1. NSA experience p. 37
- 2. Feedback from stakeholders p. 37
- 3. Revision of NSRs to take into account the EC regulation on CSM for risk evaluation and assessment p. 37

### **(G) 1.** NSA experience

The infrastructure manager has used the CSM for the tunnel Schumann-Josaphat placed into service in 2016.

DRSI has two main concerns with the implementation of the regulation on Common Safety Methods (CSM) by the sector:

- 1) The DRSI has doubts about the argumentation in several cases, when the applicant declares, at the end of his analysis according to the CSMs, that the change is not significant. Not applying the CSMs complicates the evaluation of 'safe integration' by the DRSI, when it concerns a change to a structural subsystem.
- 2) Generally speaking, it seems that the applicants and in particular the infrastructure manager are not paying enough attention, in their analysis, to the interfaces with other actors, although this is provided for in the regulation.

Concerning issue 1, the DRSI reflects on a proposal of a list of changes that systematically will be considered as significant, for each of the three domains concerned (rolling stock, infrastructure and railway undertakings).

Concerning issue 2, the DRSI will remind the sector of its obligations to take the interfaces between participants into account.

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

Null

**G 3.** Revision of NSRs to take into account the EC regulation on CSM on risk evaluations and assessment

Null





# DEROGATIONS REGARDING ECM CERTIFICATION SCHEME

Not applicable for DRSI.

In Belgium, the certification of ECMs is entrusted to accredited bodies (by Belac) for product certification (according to the standard EN ISO/CEI 17065). To date, Belgorail is the only Belgian body authorized to certify ECMs.



#### **ABBREVIATIONS**

A	CF	Administration des Chemins de Fer (NSA LU)	IM	Infrastructure Manager
c	S	Control Command and Signalling (TSI)	IL&T	Inspectie Leefomgeving en Transport (NSA NL)
CT	SA	Channel Tunnel Safety Authority (NVI CT)	Infrabel	Belgian infrastructure manager
DI	B Netz	German IM	MS	Member-State
De	eBo	Designated Body	NIB	National Investigation Body
DI	MU	Diesel Motor Unit	NMBS/SNCB	Belgian railway undertaking (passengers)
DI	RSI	Department for Rail Safety and Interoperability (NSA BE)	NoBo	Notified Body
FP	PS MT	Federal Public Service Mobility and Transport	NRV	National Reference Value
EE	BA	Eisenbahn-Bundesamt (NSA DU)	NSA	National Safety Authority
EC	M	Entities in charge of maintenance	NSR	National Safety Rule
ER	RAIL	European Railway Accident Information Links	NVR	National Vehicle Register
EF	PSF	Etablissement Public de Sécurité Ferroviaire (NSA FR)	00	National Investigation Body on Rail Accidents and Incidents
ER	RA	European Railway Agency	ORR	Office of Rail and Road (NSA UK)
EF	RTMS	European Railway Traffic Management System	отм	On Track Machine
E۸	NU	Electric Motor Unit	RU	Railway Undertaking
ET	ĊŚ	European Train Control System	RFC	Rail Freight Corridor
CS	51	Common Safety Indicator	SMS	Safety Management System
CS	M	Common Safety Method	SPAD	Signal Passed At Danger
CS	т	Common Safety Target	TSR	Temporary Speed Restriction





## ANNEXES

ANNEX 1: Themes for supervision in 2017 p. 44 ANNEX 2: Common safety indicators (CSI) p. 45

ANNEX 3: Vehicles p. 47

ANNEX 4: Implementation of safety measures on account of safety recommendations p. 49

ANNEX 5: Changes in legislation p. 52

### ① **1.** Themes for supervision in 2017

Railway undertakings		Training bodies, training	g centres and medical and psychological centres:		
"System" audits	Verification of the effectiveness of the safety man- agement system through audits on the manage- ment practices	System "audits"	Management practices, in cooperation with an external consultant, a system audit was developed in 2016. This new system audit will be carried out		
Inspections	Management of circulation restrictions	A Jita	In 2017 for the first time.		
	Analysis of incidents and accidents by the RUs (focus on SPADs and withdrawals of safety functions)	Audits	centres: for every application for adaptation of		
	Change management linked to authorisations for entry into service of stock (focus on the amendment of internal rules and training of safety personnel)		approval and for every renewal of the centre's approval. Annual audit on the functioning of the medical and psychological centres (annually as long as the		
	Management of the same auxiliary by several RUs		approval is valid)		
	REGULATION (EU) No 1078/2012 OF THE COMMIS- SION of 16 November 2012		Approval audit of the training centres and bodies: for every application for adaptation of approval and		
	Implementation of the application MERL-IN		for every renewal of the centre's approval.		
Verification of conformity	Safety rules linked to the composition of trains		Annual audit on the functioning of training centres		
	Safety personnel from RUs by insisting on the per- sonnel from contractors		(certain approvals (RD 2008) are not limited in time).		
	Carriage of explosives		Inspection on certification of examiners recognised by DRSI.		
Infrastructure manager		Controls	During the audits, checks are carried out on site, the results are included in the audit reports.		
"System" audits	Conclusion of the audit on maintenance procedures of Infrabel SMS	For 2017, the topics for au	dits, inspections and controls for railway undertakings,		
	Management practices	psychological centres are included in the table.			
	Audit safe management of Infrabel projects in the context of renewal of installations or new installations; part ETCS and part restructuring Brussel-Schuman. Audit in collaboration with consultant.	<ul> <li>For the training bodies, training centres and medical and psychological cent special attention will be paid to the below items during these inspections:</li> <li>the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the implementation of the new criteria on language requirements for the new criteria on language requirement of the new criteria on langu</li></ul>			
Inspections	Application os safety procedures in signalling centres	force on 1/1/16. Throug	ah the system of three-yearly occupational fitness checks		
	Procedures rail_road cranes during railwork next to tracks in service	on train drivers, the imp • the internal procedures	blementation of this rule will take three years.); s for the certification and maintenance of professiona		
	Level Crossing	skills of examiners invol	lved in the specific training; (especially the way in which		
Verification of conformity	Visibility of signals	out, will be audited);	introduction of new technologies of equipment is carried		

- the implementation of the new procedure for the certification of examiners involved in the basic training currently organised by the DRSI (the correct integration of the new elements into the training plans of the training centres was audited);
- the measures that should make rectification of the findings made in 2016 possible

### () 2. Common safety indicators (CSI)

#### **SIGNIFICANT ACCIDENTS**

Significant accidents according to type										
				accident to						
				persons						
			level	involving						
			crossing	rolling stock	firein			1 000 000		
year	collision	derailment	accident	in motion	rolling stock	other	total	train-km		
			а	bsolute valu	e					
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		
			value relat	ive to millio	n 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		

#### FATALITIES

Fatalities according to category of persons concerned									
			level				1 000 000 000		
		employee or	crossing				passenger-	1 000 000	
year	passenger	contractor	user	trespasser	other person	total	. km	train-km	
			absolut	e value					
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	
		value relat	ive to millio	n 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	
		value relative	e to billion p	assenger-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	1,038	0,189	0,094	1,321	10,6	96,7	
2016	0,190	0,095	0,380	0,380	0,285	1,330	10,5	97,1	

#### SERIOUSLY INJURED PERSONS

Serious injuries according to category of persons concerned									
			level				1 000 000 000		
		employee or	crossing				passenger-	1 000 000	
year	passenger	contractor	user	trespasser	other person	total	km	train-km	
			absolut	e value					
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	
		valu	e 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	
		valuer	elative to bil	lion passeng	jer-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	0,094	0,472	10,6	96,7	
2016	0,855	0,095	0,760	0,095	0,000	1,804	10,5	97,1	

#### DANGEROUS GOODS AND SUICIDE

	Dangerous goods and suicides										
	accident										
	involving at	number of									
	least one	such									
	railway	accidentsin									
	vehicle	which									
	transporting	dangerous									
	dangerous	goods are		attempted	1 000 000						
year	goods	released	suicides	suicide	train-km						
		absolut	e val ue								
2016	0	0	104	21	97,1						
	val										
2016	0	0	1,1	0,2	97,1						

#### **TECHNICAL SAFETY OF INFRASTRUCTURE AND ITS IMPLEMENTATION**

#### PRECURSORS

Precursors of accidents											
					passed at	passed at					
		track buckle			danger,	danger,	broken	broken axl e			
		and other	wrong-side	signal	when	without	wheel on	on rolling			
		track mis-	signalling	passed at	passing a	passinga	rolling stock	stockin		1 000 000	
year	broken rail	alignment	failure	danger	danger point	danger point	in service	service	total	train-km	
					absol ute val u	е					
2011	45	21	2	91	NA	NA	0	0	159	101,3	
2012	52	26	12	75	NA	NA	0	0	165	99,3	
2013	76	29	4	56	NA	NA	1	0	166	97,0	
2014	57	6	3	66	NA	NA	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	
				valuerela	ative to million	n train-km					
2011	0,444	0,207	0,020	0,899			0,000	0,000	1,57	101,3	
2012	0,524	0,262	0,121	0,756			0,000	0,000	1,66	99,3	
2013	0,784	0,299	0,041	0,577			0,010	0,000	1,71	97,0	
2014	0,590	0,062	0,031	0,683			0,000	0,000	1,37	96,6	
2015	0,362	0,269	0,052	0,952	0,414	0,538	0,000	0,000	2,59	96,7	
2016	0,381	0,237	0,072	0,937	0,433	0,505	0,000	0,000	2,56	97,1	

Train protection systems

	Technical safety - automatic train protection ATP											
	ATP. TBL1+		ATP. TBL1+		percentage of train-km using tracks equiped with ATP. TBL1+	percentage of train-km using tracks equiped with ATP. TBL1+	1 000 000					
year	excluded	TBL1+	included	track-km	excluded	included	train-km					
2008	6%	0%	6%	6 282								
2009	7%	11%	17%	6426								
2010	7%	18%	24%	6 3 4 4			100,7					
2011	7%	26%	33%	6 3 4 4			101,3					
2012	9%	34%	43%	6 4 4 6			99,3					
2013	13%	51%	54%	6472			97,0					
2014	15%	62%	65%	6 522			96,6					
2015	23%	74%	80%	6 5 1 4	12%	88%	96,7					
2016	24%	74%	80%	6511	18%	87%	97,1					

#### **COST OF ACCIDENTS**

1 000 000 I cost train-km
101,3
34,700 99,3
34,214 97,0
43,147 96,6
24,468 96,7
27,912 97,1
101,3
0,350 99,3
0,353 97,0
0,446 96,6
0,253 96,
0,287 97,

#### Level crossings

Technical safety - level crossings						
			percentage			
			of level			
			crossings			
		level	with		number of	
	number of	crossings	automatic or		level	
	level	with	manual		crossings	
year	crossings	protection	protection	track-km	per track-km	
2006	2 0 3 7	1 613	79%	6 2 1 2	0,328	
2007	1 957	1 581	81%	6212	0,315	
2008	1 929	1 562	81%	6 282	0,307	
2009	1 913	1 569	82%	6 4 2 6	0,298	
2010	1 902	1 560	82%	6 344	0,300	
2011	1 879	1 595	85%	6 344	0,296	
2012	1 857	1 590	86%	6 4 4 6	0,288	
2013	1 848	1 581	86%	6472	0,286	
2014	1 818	1 554	85%	6 522	0,279	
2015	1773	1 530	86%	6 514	0,272	
2016	1 751	1 514	86%	6 5 1 1	0,269	

### () 3. Vehicles

#### Authorisation for placing into service of new or modified rolling stock

Name of vehicle type	Vehicle category	Authorisation n°	Authorisation category	Description modification(s)
ES64U4-H/H1 (HLE 18/19 NMBS)	Locomotive	BE51 2016 0001	Upgrade	New SW version F1.8.1
ES64U4-H/H1 (HLE 18/19 NMBS)	Locomotive	BE51 2016 0006 ed.1	Upgrade	New SW version F1.8.2
ES64U4-H/H1 (HLE 18/19 NMBS)	Locomotive	BE51 2016 0006 ed.2	Upgrade	New SW versions F1.8.2 and F1.9.1
ES64U4-H/H1 (HLE 18/19 NMBS)	Locomotive	BE51 2016 0007	Upgrade	New SW version F1.9.1
TRAXX F140MS, variant KF (D-A-B-NL)	Locomotive	BE51 2016 0004 ed.1	Upgrade	New SW version 7D with ETCS and TBL1+
TRAXX F140MS, variant KF (D-A-B-NL)	Locomotive	BE51 2016 0004 ed.2	Upgrade	New SW version 7D1 with ETCS and TBL1+
TRAXX F140MS, variant KL (D-B-F)	Locomotive	BE51 2016 0005 ed.1	Upgrade	New SW version 7D with ETCS and TBL1+
TRAXX F140MS, variant KL (D-B-F)	Locomotive	BE51 2016 0005 ed.2	Upgrade	New SW version 7D1 with ETCS and TBL1+
Diesel-electric loc Class 66	Locomotive	BE51 2016 0002 ed.1	Upgrade	Installation TBL1+
Diesel-electric loc Class 66	Locomotive	BE51 2016 0002 ed.2	Upgrade	Installation TBL1+
Electric motorunit EMU 75-76-77	Trainset	BE51 2015 0003 ed.2	Upgrade	Modernisation
Electric motorunit CFL 2200 TER 2N NG	Trainset	BE51 2016 0003 ed.1	First	First authorisation for Belgium
Electric motorunit CFL 2200 TER 2N NG	Trainset	BE51 2016 0003 ed.2	Upgrade	Installation ETCS
Hispeed trainset Velaro e320	Trainset	BE51 2015 0004	First	First authorisation for Belgium
Double-deck driving coach M6 Bx	Driving coach	BE52 2010 0002 ed.3	Upgrade	Installation ETCS
Wagon type LO4A	Wagon	BE53 2016 0002	First	First authorisation for Belgium
Wagon type LUTECIA	Wagon	BE53 2016 0001	First	First authorisation for Belgium
Mesuring motorunit catenary EM 201	Special vehicle	BE54 2015 0003 ed.3	Upgrade	Remove limitations
Mesuring motorunit ETCS EM 202	Special vehicle	BE54 2012 0003 ed.3	Upgrade	Remove limitations
Mesuring motorunit ETCS EM 203	Special vehicle	BE54 2015 0001 ed.3	Upgrade	Remove limitations
Grindingtrain type RR48M-3	Special vehicle	BE54 2016 0003	First	First authorisation for Belgium
Crane Kirow KRC 1200	Special vehicle	BE54 2016 0002	First	First authorisation for Belgium

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

Туре	Registered
OTM	158
Rescue-coach	8
DMU	94
EMU	774
HST	11
D-loc	275
E-loc	349
Coaches	1567
Wagons	13080

### ① 4. Implementation of safety measures on account of safety recommendations

#### Authorisation for placing into service of new or modified rolling stock

Safety recommendation	Safety measure	Status of the implementation
Remersdaal R1 (accident of 01/10/2013, report published by the national investigative body in December 2014)	<ul> <li>The parties in the railway sector must thoroughly reconsider the collision risks as a consequence of one train overtaking another:</li> <li>to determine the different elements that play a part at the organisational, technical or operational level;</li> <li>to determine the management and supportive measures to be taken.</li> </ul>	In 2015 the IM included this topic in various working groups. The analysis of this recommendation is being carried out. This item has been taken up in different working groups, by the end of 2016 there was no consensus within the sector regarding this item
Wetteren R2 (accident of 04/05/2013, report published by the national investigation body in December 2015)	The railway undertakings implement procedures to limit the risks of reduced alertness of train drivers to a minimum.	The functionalities of the TBL1+ system were expanded to TBL1++ and these are now being installed in the equipment. The functionalities of this version, TBL1++, will be further expanded with the NG version; the new version will probably be operational in 2017. The development of TBL1+ NG was not yet fully completed at the end of 2016.
Wetteren R3	The railway undertakings and the infrastructure manager will, as far as possible, take account of the principle of human error in such a manner that a simple failure does not immediately result in a disas- ter and that the identified risks are limited by structural and opera- tional measures.	Ditto R2.
Wetteren R4	The railway undertakings and the infrastructure manager evaluate their safety policy system with a view to detailing operational mea- sures that could improve the safety level in the intermediate period, between now and the full equipping of the network with ETCS.	Ditto R2 and R3.
Wetteren R5	The railway undertakings and the infrastructure manager include the risk analyses and LMRA in their procedures and ensure that those arrangements, safety rules and safety perimeters are observed by their own personnel and (sub)contractors and that those present are made sufficiently aware of the risks connected with the presence of RID goods.	According to the IM management, the infrastructure has worked pro- perly and the regulations are in order. And yet this recommendation is directed to IM. The IM believes that this recommendation, if the NIB finds it neces- sary, should be discussed in structural consultations, with a view to translating the formulated recommendations into concrete recom- mendations, and if required an action plan. This item is considered closed, unless the NIB wishes to proceed with the IM proposal. The NIB has not responded to this report from the sector, nor with regard to the DRSI analysis via the annual report follow-up recom- mendations that the DRSI has sent to the NIB. As a result, we consider this item as closed at the end of 2016.

Safety recommendation	Safety measure	Status of the implementation
Wetteren R8	The infrastructure manager must fulfil the agreements as provided for in the INIP with a view to avoiding possible misunderstandings.	According to the IM management, the infrastructure has worked pro- perly and the regulations are in order. And yet this recommendation is directed to IM. The IM believes that this recommendation, if the NIB finds it neces- sary, should be discussed in structural consultations, with a view to translating the formulated recommendations into concrete recom- mendations, and if required an action plan. This item is considered closed, unless the NIB wishes to proceed with the IM proposal. The NIB has not responded to this report from the sector, nor with regard to the DRSI analysis via the annual report follow-up recom- mendations that the DRSI has sent to the NIB. As a result, we consider this item as closed at the end of 2016.
Wetteren R9	The infrastructure manager evaluates the procedures to guarantee that all information expected of them about RID goods is immediately and automatically notified to HC100.	According to the IM management, the infrastructure has worked pro- perly and the regulations are in order. And yet this recommendation is directed to IM. The IM believes that this recommendation, if the NIB finds it neces- sary, should be discussed in structural consultations, with a view to translating the formulated recommendations into concrete recom- mendations, and if required an action plan. This item is considered closed, unless the NIB wishes to proceed with the IM proposal. The NIB has not responded to this report from the sector, nor with regard to the DRSI analysis via the annual report follow-up recom- mendations that the DRSI has sent to the NIB As a result, we consider this item as closed at the end of 2016.
Linkebeek (accident of 03/11/2014, report published by the national investigation body in December 2015)	Measures to bring the effects of reduced adhesion to an absolute minimum.	The RUs, the IM and DRSI analyse the recommendations and will define measures in the spring of 2016. Follow-up in 2016. The IM is conducting a risk analysis in cooperation with the RUs, which addresses adhesion problems. A procedure is being developed for faster transfer of the information available on the rolling stock to the IM's Traffic Control Service. The IB operates a system for improving the monitoring of the actions for cleaning the tracks

Safety recommendation	Safety measure	Status of the implementation
Binche (accident of 13/01/2016, report published by the national investigative body in July 2016)	Improve the procedure for validating changes to the signalling	The IM carries out an analysis to determine how certain procedures can be linked and/or share information with the aim of increasing performance. The DRSI conducted an audit at the end of 2016, the results will be announced in early 2017.
Landen (accident of 18/02/2016, report published by the national investigative body in October 2016		The RUs, the IM and DRSI are analysing the recommendations and will prepare measures in the spring of 2017. Follow-up in 2017.
Schaarbeek (accident of 10/10/2014, report published by the national investigation body in November 2016)		The RUs, the IM and DRSI are analysing the recommendations and will prepare measures in the spring of 2017. Follow-up in 2017.
Antwerp (accident of 01/11/2015, report published by the national investigation body in November 2016)		The RUs, the IM and DRSI are analysing the recommendations and will prepare measures in the spring of 2017. Follow-up in 2017.

### () **5.** Changes in legislation

#### Railway safety directive

AMENDMENTS TO RSD	Transposed (Y/N)	Legal reference	Date of entry into force
/	/	/	/

#### Important changes

LEGISLATION AND REGULATIONS	Legal reference	Date of entry into force	Description of the change	Reasons for the change
Concerning the NSA	/	/	/	/
Legislation on the NoBos, DeBos, NIBs, third party entities for registration, inspec- tion, etc.	/	/	1	/
Concerning RUs/IMs/ ECMs	/	/	/	/
Implementation of other EU requirements (if concerning railway safety)	/	/	1	/



Kingdom of Belgium National Safety Authority

Pepartment for Rail Safety and Interoperability