German Federal Railway Authority Report

on activities as safety authority pursuant to Article 18 of the Directive on safety on the Community’s railways (Directive 2004/49/EC, ‘Railway Safety Directive’).



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Contents

[A. Introduction 4](#_Toc530579220)

[B. Safety Balance Sheet and Strategy 5](#_Toc530579221)

[B.1 Main conclusions for the reporting year 5](#_Toc530579222)

[B.2 National safety strategies, programmes and initiatives 5](#_Toc530579223)

[B.3 Assessment of the reporting year 5](#_Toc530579224)

[B.4 Priority areas for 2018 7](#_Toc530579225)

[C. Development in the safety sector 9](#_Toc530579226)

[C.1 In-depth analysis of the trends noted in the recent past 9](#_Toc530579227)

[C.2 Results of the safety recommendation from the BEU (German Federal Agency for Railway Accident Investigation). 11](#_Toc530579228)

[C.3 Measures implemented without reference to safety recommendations 16](#_Toc530579229)

[D. Supervision 17](#_Toc530579230)

[D.1 Strategy and plan(s) 17](#_Toc530579231)

[D.2 Staff 19](#_Toc530579232)

[D.3 Skills 19](#_Toc530579233)

[D.4 Decision-making 20](#_Toc530579234)

[D.5 Co-ordination and co-operation 20](#_Toc530579235)

[D.6 Lessons learned from measures adopted 21](#_Toc530579236)

[E. Safety certification and authorisation 22](#_Toc530579237)

[E.1 Guidelines 22](#_Toc530579238)

[E.2 Contacts with other national safety authorities 22](#_Toc530579239)

[E.3 Procedural aspects 22](#_Toc530579240)

[E.4 Feedback 22](#_Toc530579241)

[F. Changes to statutes and regulations 23](#_Toc530579242)

[F.1 Railway Safety Directive 23](#_Toc530579243)

[F.2 Changes in legislation and administrative regulations 23](#_Toc530579244)

[G. The application of CSM to risk evaluation and assessment 24](#_Toc530579245)

[G.1 Experience of the safety authority 24](#_Toc530579246)

[G.2 Feedback from providers 25](#_Toc530579247)

[G.3 Revision of national safety regulations to take account of the Commission Regulation   
on CSM for risk evaluation and assessment 25](#_Toc530579248)

[H. Application of CSM monitoring 26](#_Toc530579249)

[I. Exceptions to the ECM certification system 27](#_Toc530579250)

[ANNEX A: Common Safety Indicators 28](#_Toc530579251)

[ANNEX B: Amended legal provisions 31](#_Toc530579252)

[Table 1: Implementation of the amendments to Directive 2004/49/EC 31](#_Toc530579253)

[Table 2: Changes to the national legal framework during 2017 32](#_Toc530579254)

[ANNEX C – Abbreviations 33](#_Toc530579255)

# A. Introduction

The German Federal Railway Authority (in German: Eisenbahn-Bundesamt; abbreviated: EBA) is the safety authority for the railway in Germany. As such, the EBA is responsible for tasks laid down in Article 16 of Directive 2004/49/EC (“Railway Safety Directive”):

* granting authorisations for the placing in service of structural subsystems in accordance with the Directive on the interoperability of the rail system within the Community (Directive 2008/57/EC),
* supervising compliance with the essential requirements for operation and maintenance of the subsystems of the railway system and for interoperability constituents,
* granting authorisations for the placing in service of vehicles that are not yet covered by a TSI,
* issuing safety certificates for railway undertakings and safety authorisations for infrastructure managers,
* monitoring and developing the railway safety regulatory framework, including the system of national safety rules,
* registration of vehicles in the national vehicle register.

In addition, the EBA performs other tasks such as planning the federal railways’ operating facilities, awarding federal grants for investments in rail infrastructure, activities relating to dangerous goods, coordinating research, and acting as the enforcement body for European passenger rights in bus and rail transport and shipping. The Federal Ministry for Transport and Digital Infrastructure (BMVI) is in charge of supervising technical and legal matters.

In accordance with Article 18 of the Railway Safety Directive, this report is limited to the EBA’s activities as a safety authority, in particular the development of:

* railway safety, including the common safety indicators (CSIs),
* the legal framework in the field of railway safety,
* safety certifications and safety authorisations, as well as
* the knowledge obtained from the supervision of railway undertakings.

With regard to structure and content, this report is based upon the relevant recommendations from the European Union Agency for Railways (ERA). Its target audience is primarily the rail sector in Germany and Europe, though it is also aimed at politicians, representatives of business and the press from other sectors, as well as interested members of the general public.

# B. Safety Balance Sheet and Strategy

## B.1 Main conclusions for the reporting year

A high level of safety has been established on the German railway system, a fact which was confirmed once more in 2017. This is clear on the one hand from the findings from rail supervisory tasks and on the other, from long-term trends in the accident figures. Even if there are increasing numbers of some types of accident in absolute terms, this is against the backdrop of an increase in transport. The EBA did not identify any fundamental structural deficits in the course of its supervisory work. However, one important topic is safety issues arising from operational staff’s actions. A number of anomalies were recorded in 2017, including a continued increase in cases of signals passed at danger, and infrastructure managers' handling of operations. For the EBA, this means that it will maintain the current railway supervision strategy and no major changes will be made in terms of the form and intensity of this strategy. In doing so, however, the EBA will pay appropriate attention to the aforementioned operational issues.

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

The following programmes were carried out in 2017, some extending over several years:

* programme for replacing older signalling technology on level crossings, for harmonising with the regulations in force, while taking into consideration any changes to the rail traffic situation; programme of replacement of old safety technology at level crossings for the purposes of harmonisation with the current regulatory framework;
* programme for technical upgrades to staffed level crossing barriers, which are not dependent on signals;
* Special programme to equip sections of track with intermittent automatic train control based on the amended requirements of the Ordinance on Construction and Operation of Railways (*Eisenbahn-Bau- und Betriebsordnung*, EBO);
* programme for completing records of drainage facilities and to draw up an inspection and maintenance plan for those facilities;
* programme for installing wildlife-proof fences in certain areas around tunnels on high speed lines;
* programme for preventative vegetation management;
* programme of measures for increasing the safety of actions performed by staff in the area of infrastructure (for more details see also B.3);
* programme for the inspection and completion of the minimum required documentation for certain constructions;
* programme for completing records of earthworks and retaining structures at traffic stations;

These programmes are largely implemented by the railways, with the EBA providing guidance in various procedures, and monitoring implementation.

## B.3 Assessment of the reporting year

After the accidents and high-risk incidents that occurred in 2016 relating to error on the part of operational staff, the focus in 2017 will remain on monitoring measures. There was a series of such incidents in the reporting year, e.g. an ICE express travelling onto an occupied line in Gruiten, as well as a works accident in Meppen. In addition to monitoring the measures already agreed with the largest infrastructure operator, DB Netz AG, the EBA has launched additional individual actions, on the basis of further findings. As a result of the train collision in Meerbusch-Osterath at the end of 2017, supplementary measures will come into effect for the reporting year 2018.

In terms of the increasing number of signals passed at danger over recent years, it was not possible to achieve a reversal of this trend in 2017. Additionally, it should be noted that more precise incident reporting on the part of DB Netz AG is surely the reason for the number of signals passed at danger has increased relatively steeply. The escalation of such incidents to the management level in the reporting year has yet to take effect. However, in this respect, the EBA has become aware that large and medium-sized rail transport companies are having to deal with a number of incidents, which is high in some cases. A series of projects have been set up that are dedicated not only to driver alertness, but also the way in which such incidences are handled generally speaking. The EBA will remain active in this area during and beyond 2017, in order to reverse the trend in the number of incidents in all companies.

In 2017, the EBA withdrew a safety certificate for the first time. Intensive monitoring of the company in question, which was triggered by a serious accident, showed that the management performance on important safety processes was wholly unsatisfactory, with lack of awareness at top management level and a lack of resources. A further fundamental issue has arisen from these findings, which it will take some time to address: contractors providing transport services virtually autonomously, while subject to the responsibility for safety issues of a railway company with a safety certificate. Consultations with the safety authorities of other states as well as the European Railway Authority have already taken place on the issues arising from this practice.

The focus of supervision always includes implementation of what is referred to as the B.2 programme, as well as action plan implementation in the company. Additionally, the EBA monitored the following issues more intensively during 2017:

* Monitoring consignments of dangerous goods arriving from abroad via joint controls with staff from operational monitoring and from dangerous goods monitoring, since trains arriving from abroad continue to have higher rates of deficiencies in comparison with national trains, although these rates are dropping in some cases;
* Technical health and safety at work: Construction site safety plans based on varying regional deficiency rates;
* Signals passed at danger due to the increasing number of incidents, management of rail transport companies with regard to their own analysis of signals passed at danger, additionally, management processes linked indirectly with those, regarding the selection of service providers for initial and further training, which have arisen from amendments to § 47 (6) EBO on working time for operational staff, as well as newly recognised technical rules, regarding train drivers’ knowledge of the route;
* Documentation of facility data relating to the maintenance processes for the infrastructure;
* Handling of error messages and malfunction of railway crossing safety equipment;
* Points inspections by PRINS-Trupps (PRojekt INStandhaltung)
* Approach and closing times at level crossings
* Electricity supply logs;
* Unambiguity of cable cabinets;
* Calculations of the impact from changes in the current-voltage curve
* Return circuit, meshing and earthing;
* Compliance with deadlines for inspections of electrical facilities.

When safety-related defects were identified, the EBA issued directives as necessary for the proper maintenance of track equipment and rolling stock, and for the safe running of operations. In addition, bilateral meetings are held at management level to discuss and agree on measures for resolving shortcomings. The EBA regularly monitors the implementation of its directives and the elimination of shortcomings. Action is still needed with regard to documentation of equipment data, track-related concepts for the elimination of shortcomings are being implemented.

In total, the EBA conducted around 20 200 checks at railway undertakings and infrastructure managers in 2017. These include on-site inspections and process audits. The steep increase in the number of cases in comparison with the previous year is mainly explained by changes in the way vehicle monitoring is recorded. Furthermore, approximately 12 850 checks were carried out in the dangerous goods sector, focusing not only on the railways, but also on other providers such as forwarding agents, loaders or fillers. Targeted controls of transport where there is cause for concern have led to improved safety culture in the companies concerned. Increased risk-oriented controls led to a slight increase in the reporting year in the rate of deficiencies in the area of dangerous goods controls to 7.5% (previous year: 7.4%), for rail traffic from abroad the rate of deficiencies was 14.0%. In the other vehicle areas, the EBA found deficiencies in 571 of 12,204 rail transport vehicles inspected, which gives a rate of 4.6%-

Guidelines for supervision of railway undertakings and infrastructure managers, with which the EBA implements the supervision criteria under the EU Regulation on a common safety method for supervision (Regulation (EU) No 1077/2012).

## B.4 Priority areas for 2018

In addition to the previous priority areas, the majority of which will continue to be core elements of monitoring, the following issues will be relevant in 2018:

* Developing equivalent conicity on vehicles by regularly measuring running surface parameters in order to take into account the prevention of wear and tear adjusted to the condition of the infrastructure;
* Interface between railway undertakings generally and the entity in charge of maintenance (ECM), in general as well as with particular regard to specifications or the ECM on the quantity of sand used;
* The role of contractors within the overall responsibility of a railway undertaking, as well as appropriate presentation of service provider controls within their safety management;
* Maintenance of deep drainage;
* Analysis of main kinds of deficiencies;
* Updating and completeness of as-built plans and as-built documentation, such as level crossings, retaining structures, missing as-built layout plans for bridges and retaining structures, fire prevention files;
* Vegetation management, including minimum distance from electrical facilities, clearance of standard structure gauge, establishing pruning zones, clearance of safety zones based on health and safety at work regulations;
* Structural integrity of platform roofs and fixtures;
* Inspection of train identification systems;
* Technical prevention of signal operation in error of Zs 1 signal (subsidiary signal), Zs 7 (caution signal), as well as Zs8 (track crossing signal replacement) for certain interlocking types (by removing of fuses within the group of signals; alternatively: covering the signal optics);
* Ventilation and air extraction for battery equipment;
* Structural integrity of road signals on old level crossing safety installations;
* Old pressurised gas tank wagons.

# C. Development in the safety sector

## C.1 In-depth analysis of the trends noted in the recent past

The trend analysis relates to the categories of Common Safety Indicators (CSIs) listed in the Directive on safety on the Community’s railways (Directive 2004/49/EC).

*Accident victims*

In 2017, the number of persons seriously injured in rail accidents was 165 the highest figure since this indicator was first recorded in 2007. The number of train kilometres travelled rose slightly, however less significantly than the number of accidents. Accordingly, the number of seriously injured persons for train kilometres travelled is – at 0.154 seriously injured persons per one million train kilometres – above the previous year (0.136). The number of passengers seriously injured was up on the previous year, from 33 to 41. The main reason for this increase is however a single event: the collision between Weißenburg and Meerbusch-Osterath on 05.12.2017, in which 35 passengers suffered serious injury. The percentage of level crossing users or trespassers or others in the total amount of all people seriously injured has continued to drop and is now just over 60 %. The number of seriously injured level crossing users decreased slightly in absolute terms once more. The number of persons seriously injured in railway accidents classified as service staff and unauthorised person increased for both categories, while the number of other persons decreased markedly.

A decrease in the number of people killed in railway accidents, a further slight increase from 150 in 2016 to 157 in the reporting year 2017, was recorded. Relative to train-kilometres travelled, this also represents a slight increase, from 0.141 to 0.146 fatalities per million train-kilometres. Similarly to the case in previous years, around 90 % of all deaths are attributable to the categories ‘level crossing users’ and ‘trespassers on railway premises’. 60% of total deaths were persons who were unauthorised to be on rail premises. In the category “Level crossing users”, the number of deaths increased from 28 to 44, all other deaths (113) occurred category “accidents involving injury”. In 2017, two passengers were killed in rail accidents.

*Significant accidents[[1]](#footnote-2)*

In 2017 on the rail network in Germany subject to the Railway Safety Directive, there were a total of 346 significant railway accidents, which was a marked increase in comparison to the previous year (310 accidents) and the highest number of accidents since records began in 2007. Relative to train kilometres, based on the increase in transport service provided, there was a moderate increase from 0.291 to 0.323 accidents per million train kilometres. Detailed analysis shows that the increase observed affected the number of accidents under the classification collision (+11 incidents), derailing (+5), accidents on level crossings (+23), as well as accidents involving personal injury (+15). By contrast, other accidents decreased and no fires on rail vehicles occurred. The collisions, of which there were 38 in total, can be subdivided into 3 collisions of trains with a railway vehicle and 35 collisions of trains with an obstruction within the clearance gauge.

*Accident precursors*

The following precursors of accidents could be recorded in relation to safety indicators: broken rails, buckled tracks, signalling errors and signals passed at danger. At 284, the number of broken rails remained well below the long-term average. At 17, the incidence of buckled tracks was also low. As for the number of signals passed at danger, following the significant increase in 2014 (+25%), the number of occurrences rose for the third year running. The Federal Railway Authority will continue to focus closely on this issue; for measures please see sections B.3 and B.4.

*Accident costs*

Details of the economic impact of accidents have also been included since 2010. Thus, in accordance with the requirements introduced under Directive 2009/149/EC, details are provided of the material and environmental damage and a calculation of the costs resulting from delays and the costs and societal losses resulting from victims of accidents. The base values used in the calculations were derived from the results of the ‘HEATCO’ Project that were recommended by the European Union Agency for Railways (an EU-sponsored project to work out principles for the economic evaluation of infrastructure projects; for further details, see http://heatco.ier.uni-stuttgart.de. When using this method of calculation, an increase in severe injuries and deaths in railway accidents also leads to a rise in accident costs. For 2017, accident costs amounting to EUR 537 million were established. This total can be broken down as follows: EUR 467 million of ‘societal losses’ due to accident victims; EUR 58 million of material and environmental damage; and EUR 12 million of costs due to accident-related delays. Since 2015, costs due to accident-related delays have been significantly lower than for previous years, because since then, the figures have been adjusted to preclude delays caused by suicides for the purposes of calculating the accident costs.

[**Annex A**](#_A.2._Listen_der) of this report contains the safety indicators.

## C.2 Results of the safety recommendation from the BEU (German Federal Agency for Railway Accident Investigation).

### *Table 1: 2017 safety recommendations*

|  |  |  |
| --- | --- | --- |
| **Safety recommendation** | **Safety measure** | **Implementation status** |
| **Event: Derailment 09.06.2013 Korb – Lorch (Rhein)** | | |
| 1. In case of malfunctions, drainage systems in the track and near the track may result in the track substructure being penetrated by moisture which may lead to track geometry defects which pose a risk to operations. The staff used for the inspection of drainage systems lack the comprehensive register on the existing drainage systems required to be able to plan and carry out regular inspections. It is recommended that all drainage systems be recorded separately in order to be able to plan and promptly carry out regular inspections of their proper functioning.  The aim of this measure is the full and regular check of the drainage systems in the track and near the track to prevent the development of track geometry defects which pose a risk to operations, which may result from the track substructure being penetrated by moisture. | Due to the fact that track drainage facilities have not yet been recorded comprehensively enough, the responsible IM has arranged for comprehensive records to be made of the facilities in questions. Furthermore, the IM has laid down standardised specifications for inspections. | The procedure has thus been closed. The German Federal Railway Authority will conduct and monitor implementation. |
| 1. Track geometry faults are evaluated in accordance with Dir. 821.2001 Section 5 based on individual defects, whereby individual defects occurring in combination are to be given particular attention. These individual defects occurring in combination also include longitudinal level defects occurring shortly after each other, i.e. cyclic longitudinal level defects. Dir. 821.1000 Section 2 and Dir. 821.2001 Table 2 include evaluation standards for individual defects defined according to the disturbance/reaction (D/R) logic and in the following sections contain instructions to be applied by the person in control of an installation (PCI). There are no specific instructions for individual defects occurring in combination. The PCI is required in accordance with Dir. 821 to consider track geometry defects occurring in combination in particular and act at their own discretion. It is recommended to state the set of rules more precisely regarding the individual defects occurring in combination. | With technical notice TM 1-2017-10135 supplementing Dir 821.2001, the IM has stipulated that where there are three individual category SR100 errors in the longitudinal level within a 50m section of track, then the IAL maintenance intervention limit has been exceeded and speed must be reduced to 70 km/h. | The procedure has been closed. |
| **Event: Collision 09.02.2016 Bad Aibling** | | |
| It is recommended that the “Zugfunknotruf” (train emergency signal) and the “Notruf-Strecke” (trackside emergency signal) in the menu of the GSM-R radio control panel be combined in one function key, after the emergency signal has been activated by the signalman/woman. | The control panel layout is currently being adapted. Measures must be completed by the end of 2018. | The procedure has thus been closed. The German Federal Railways Authority will monitor implementation. |
| **Event: Impermissible entry to an occupied section of track 01.02.2017 Gruiten.** | | |
| The safety authorities must check the DB Netz AG rules for “Abschnittsprüfung” (section inspection) for safety in use and, if necessary work toward changes which exclude any erroneous interpretation by the user as far as possible. | Even before the accident report had been announced, the German Federal Railway Authority had addressed the need for action to improve internal processes and make working instructions clearer. This measure is to be addressed over the long term.  At the end of 2017, the company had already arranged its own amendments to the operational procedures concerned for signalmen/women. The EBA will supervise implementation. | The procedure has not yet been concluded. |
| **Event: Derailment 11-09.2015 Duisburg-Wedau-Lintorf** | | |
| 1. In the context of regular further training and supervision, or by other suitable means the train driver must be made to comply closely with the rules relating to irregularities with vehicles and cargo and imminent danger. With regard to the train driver recognising and repairing defective rail wagons, efforts must be made to considerably improve workmanship. The train driver must be made particularly aware of the importance of these activities, because unrecognised defects on vehicles almost inevitably lead to serious accidents, since failsafe devices are often lacking. | The German Federal Railway Authority will monitor whether implementation has taken place in the context of regular further training. | The procedure has not yet been concluded. |
| 1. Quality control for maintenance is to be optimised if necessary, in accordance with support process U7.2.4.2. It is to be ensured that only staff with the necessary qualifications will be deployed for diagnostic inspections of wheelset axles and instructions from DB Schenker Rail AG IW-C(W)2014/10 are to be strictly adhered to. | After the safety recommendations in December 2017, the German Federal Railway Authority discussed the circumstances with the railway undertaking. The main issue for the safety recommendations was a report from RWTH Aachen of which the Federal Railway Authority was not aware and the assumption that the extensive loss of lubricant which had already been noticed in March 2015, had not resulted in the wheelset axle being replaced. Subsequent verification of the facts found deficiencies in the exchange of information between the railway undertakings concerned. Not all required information and maintenance certificates of the wheel set axle inspection carried out in March had been provided, which then led to an incorrect description of its actual condition. Although there is no doubt that the derailment is to be traced back to extensive loss of lubricant, it is unlikely that the lubricant had been leaking since as far back as March 2015 – and thus some six months before the incident.  The instruction described has been integrated into the maintenance regulations currently in force. | The procedure has been closed. |
| 1. The movements controller must be made to comply closely with rules 408.0553 und 408.0581 through regular further training and monitoring. | The German Federal Railway Authority will monitor whether implementation has taken place in the context of regular further training. | The procedure has not yet been concluded. |

### *Table 2: Safety recommendations from previous years where no changes have occurred in the reporting year*

|  |  |  |
| --- | --- | --- |
| **Safety recommendation** | **Safety measure** | **Implementation status** |
| **Event: Vehicle fire at Wilhelmshaven on 25 April 2015** | | |
| 1. Aimed at the engine manufacturer:    * Stipulating the use of non-flammable and wear-resistant material for the diesel leakage pipe and defining a maximum length of use.    * Carry out fire-prevention measures on the turbocharger and exhaust gas pipe.    * Perform structural adaptation of the fuel return. | No change compared to the previous year. | The German Federal Railway Authority has extended the monitoring of the measures which the owners of the vehicles concerned had undertaken on the basis of this information to 2018. On doing so, findings from the reporting period 2017 were taken into account.  The procedure has not yet been concluded. |
| **Event: Train collision Gladbeck West 26.10.2013** | | |
| 1. Minimising the current procedure 'Staff authorised to carry out brake tests on trains' to an absolutely necessary extent (emergency case, e.g. after failure during a train journey, which makes a brake test necessary) | VDV Guideline 757 (Association of German Transport Undertakings) has been amended. | The procedure has been closed. |
| **Event: Level crossing accident Düsseldorf-Rath - Düsseldorf Eller 19.12.2012.** | | |
| As part of the planning and approval of level crossing safety, on the basis of a risk assessment, application of the technical level crossing protection measures in accordance with § 11(6) EBO should be specified and modified, with the aim of minimising damage caused by broken-down vehicles in the danger area of the level crossing as far as possible. | This issue must be addressed further. The infrastructure operator is currently amending the corresponding Guideline 815. Additionally, it is currently carrying out tests in the context of piloting various systems for monitoring danger zones. This was triggered by the fact that the tried-and-tested equipment for danger zone clearance signalling is no longer available at this time and so there is a need for equivalent systems. Solutions may also arise from this for general recognition of vehicles which have broken down. The first findings are expected in Q3 of 2018. | The procedure has not yet been concluded. |

## C.3 Measures implemented without reference to safety recommendations

To comply with the statutory railway-related provisions in individual cases, the Federal Railway Authority conducted administrative proceedings in 2017 as well, which were concerned with organisational or technical/operational improvement of the undertakings’ safety processes. The EBA also published technical notices on various cases. These are permanently available for download from the internet: <https://www.eba.bund.de/SiteGlobals/Forms/Suche/Expertensuche/FM_Expertensuche_Formular.html>

By way of an administrative decision, the German Federal Railway Authority has laid down an obligation for the railway and owner in their original competences at the end of 2017, to inform the authorities of dangerous incidents. The information acquired in this way has enabled the German Federal Railway Authority to carry out danger-prevention tasks, independently of other offices. This obligation first became legally binding in 2018.

Further measures are shown in the table below.

|  |  |  |
| --- | --- | --- |
| **Area concerned** | **Trigger moment** | **Action** |
| Infrastructure: Oberbau, points | On inspection, damage was found to the swing noses of Witten EB-Vollbainit type turnouts. Swing noses from Vollbainit have proved problematic in Germany, but there are still over 700 of this type installed. | These swing noses are now to be inspected every month, visually and with ultrasound. The three-month interval stipulated in the previous technical notice from 2017 is insufficient. If a deficiency is found, speed restriction of v=70 km/h are to be imposed. These additional inspections are to be carried out until all Vollbainit swing noses have been replaced. |
| Infrastructure: Earthworks, retaining structures | Retaining structures have to be surveyed and maintained in order to ensure safety. The basis for this is systematic records of these structures, drawn up by the infrastructure manager. Various incidents have demonstrated room for improvement in practice. | From now on, complete records must be drawn up on retaining structures when maintenance is carried out. |
| Infrastructure: Tunnels and culverts | Findings from the railway supervision shows that there is room for improvement in the way that the condition of tunnels and culverts are evaluated. | The infrastructure manager concerned has improved the procedures for evaluating the condition of tunnels and culverts. |

# D. Supervision

## D.1 Strategy and plan(s)

The EBA regularly monitors railway undertakings and infrastructure managers, and of the bodies responsible for the maintenance of other types of vehicles such as freight wagons, on the basis of random sampling. The monitoring is aimed at gathering information on

* the effectiveness of the safety management system and
* discharging safety responsibilities in railway operations, and also
* compliance with legal regulations on railways and
* generally accepted technical standards.

To this end, the EBA conducts audits and inspections and also uses information from other sources, such as for example the Federal Railway Accident Investigation Office. The EBA’s supervision work serves the purpose of maintaining the existing safety level within the scope of its legal responsibilities. The circle of undertakings concerned is permanently recorded, based on the legal requirements. The undertakings are informed of the scope and scheduling of the supervision, but unannounced inspections also make up a significant element of the supervision.

On the basis of Regulation (EU) No 1077/2012 on a common safety method for supervision by NSAs and of general administrative law, the EBA configures its supervisory procedures in accordance with the following basic criteria:

* proportionality,
* consistency,
* fitness for purpose,
* transparency,
* accountability and
* cooperation.

The supervision comprises systematic checking whether the railways consistently comply with the requirements that apply for the granting of a safety certificate or safety authorisation - defined in Annex II to Regulations (EU) No 1158/2010 for railway undertakings and, as applicable, 1169/2010 for infrastructure managers. The EBA continues to check whether undertakings’ processes and procedures for the process of continuous improvement are being updated, where necessary, and whether the railways are applying the provisions of Regulation (EU) No 1078/2012 on a common safety method for internal monitoring to be applied by railway undertakings.

Supervision in the field of vehicles, operations and dangerous goods focuses on the provision of safe railway transport services on track operated safely for that purpose. The focus here is on safe organisation of the business activities of the railway undertakings and infrastructure undertakings in railway operations and technical matters, as well as the undertakings’ compliance with their general or special legal obligations. The strategy of taking a preventative approach to monitoring the completeness of the safety management system by way of process audits, as well as monitoring the company’s “sichere Fahrt” product through product audits and inspections, has proved successful. In this context, it is evident in the case of many undertakings that functioning safety management regulates itself, in the event that deviations from the targets set occur, with the aid of a corresponding control loop model. In the area of control of dangerous goods, the German Federal Railway Authority is pursuing a two-pronged approach of supervision close to time of dispatch and supervision focussed on deficiencies. This means that where more deficiencies have arisen, more frequent controls are carried out. This risk-oriented strategy is reinforced by focussing on priority areas when carrying out controls.

The EBA also monitors track operators, basically with relation to the undertakings. When doing so, the areas of construction of facilities, maintenance and operation are covered; generally, the overall working methods and implementation of the safety management system are assessed. For this purpose, the EBA conducts process-and site-related supervision and special supervision over the infrastructure managers. By these means, random checks are carried out as to whether the undertakings are implementing safety-related processes in practice in a manner compliant with the requirements and whether, during the use of the approved systems, they are also complying with the General Railway Act (AEG) and the legal regulations based upon that act, as well as recognised codes of engineering practice. A significant cornerstone of railway supervision is also the verification of the fulfilment of the railways’ safety obligations, as laid down in §4(3) AEG. The principles are further specified in the Administrative Regulation on monitoring the installation and maintenance of systems. The administrative rules are available on the internet.

<https://www.eba.bund.de/DE/RechtRegelwerk/Verwaltungsvorschriften/VVEA/vvea_node.html>

The German Federal Railway Authority monitors undertakings through random sampling. The random sample is established by the EBA at its own discretion in order to ensure that a representative cross section is monitored. In doing so, the EBA proceeds in a risk-oriented manner, i.e. taking into account the respective potential for danger in the technical fields of infrastructure, rolling stock and operations. In all fields, there are annual/multi-year plans for supervising the railways; these are regularly reviewed and, if necessary, revised on the basis of the results of the ongoing supervision. Announced and unannounced supervision measures take place on the basis of the plans. The aim is to inspect every undertaking, irrespective of size, at least once a year in the form of a process audit. Larger railway undertakings and infrastructure managers are monitored more often, on a differential basis according to region. The specialists at Head Office establish the requirements for the supervision plans and regularly liaise on this with the divisions of the EBA external offices. If there are findings arising from dangerous incidents or if there is a suspicion of systematic defects, the EBA conducts special and priority area inspections where necessary. The results of the supervisory measures are recorded in special databases and are then available as the basis of evaluations, for setting future priority areas, for adaptations of the supervision plans and for recertifying undertakings.

## D.2 Staff

A total of approximately 285 EBA employees are engaged in activities in the supervisory field.

## D.3 Skills

The sections of the EBA responsible for staff and organisation implement skills management in co-operation with the respective specialist offices of the EBA. The components are as follows:

* Defining requirements

Job descriptions contain both necessary expert skills and general qualifications such as interpersonal or methodological skills. The EBA regularly revises job descriptions and professional profiles.

* Establishing fulfilment of requirements

When a new person is appointed, their skills are verified by way of a structured thematic interview and possibly roleplaying exercises. For higher grades, a potential analysis may additionally be used in order to establish potential, especially in terms of interdisciplinary skills. Special induction courses given by the respective specialist departments prepare new employees for their future tasks.

* Continuing further training

The training needs of each employee and each organisational unit are reviewed once a year. The EBA Further Training Office organises targeted coverage of these needs. Furthermore, there are training officers in the specialist departments, who liaise closely with the Further Training Office and hold specialist training courses annually, to keep the knowledge specific to a specialist area up to date. Every year, around 250 further training courses are held. The trend is rising. E-learning programmes are also offered, e.g. for the subject areas of occupational safety - in the office and on the track.

* Quality assurance in further training

At the end of each further training course, there is an anonymous evaluation sheet which can be completed. The Further Training Office evaluates these and passes them on to the respective event organisers. This makes it possible to constantly improve the targeted training on offer.

* In-house training

The EBA offers career-oriented training courses in high-level and senior technical grades, in up to five different subjects, depending on the future field of activity. Following on from their regular studies, new employees are offered the best possible preparation, initially for one or two years, primarily in relation to their technical tasks. By observation and training courses, they can profit from the knowledge and skills of experienced staff already in post. This ensures retention of specialist knowledge at the EBA and task-specific training of new entrants. Furthermore, depending on need, the EBA offers dual vocational courses in various disciplines, for example for employees specialising in office communication or administrative staff.

## D.4 Decision-making

The German Federal Railway Authority takes decisions within the framework for supervising railway undertakings and infrastructure managers, on the basis of the legal provisions in force, which have been specified in the administrative rules. In doing so, it takes into account the underlying principles of EU Regulation 1077/2012 on supervision by national safety authorities, including proportionality, coherence and transparency.

The EBA draws on the following sources to determine the criteria of its supervision:

* information from the evaluation of the safety management system,
* results of past supervisory work, especially supervision of railways,
* accident reports and recommendations from the BEU (German Federal Railway Accident Investigation Board).
* other reports or data on accidents or disruption,
* railway safety reports,
* information from authorisations for placing in service,
* communications from national safety authorities from other Member States,
* information from the European Union Agency for Railways,
* reports and complaints from the public and
* other resources.

Those affected by the decisions of the EBA can lodge objections to them by way of administrative proceedings, and can bring an action before the administrative courts if an objection is overruled.

The enforcement by the authorities of organisational improvements in the undertakings’ safety management systems has proved to be a challenge for the EBA. The underlying administrative procedure must include enforceability of official instructions, but the undertakings’ freedom to select suitable organisational solutions runs counter to this.

## D.5 Co-ordination and co-operation

The EBA cooperates closely with national safety authorities of other countries. This includes information exchange and the possibility of co-ordinating aspects of supervision (primarily the monitoring of railway undertakings working across borders and in relation to rolling stock). In 2017, joint supervision operations were occasionally carried out with the supervision authorities of neighbouring countries (especially Belgium, Switzerland and the Netherlands). Contact is also maintained with the safety authorities in the Czech Republic, Poland and Italy in relation to dangerous goods. For the Fehmarn Belt Fixed Link, a cross-border project between Denmark and Germany, as in previous years, supervisory and authorisation procedures are coordinated on a regular basis between the Danish safety authority and the EBA. Initial discussions have been held in relation to the conclusion of co-operation agreements with the authorities of neighbouring countries, as envisaged in EU Directive 1077/2012. The aim is to achieve better coordination in the supervision of railway undertakings active in cross-border transport.

## D.6 Lessons learned from measures adopted

Both the supervision strategy and the measures adopted under it have proved to be fundamentally successful. With regard to internal measures, the measures to increase the use of databases particularly have intensified in recent years and proved to be an effective and valuable support for the proper supervision of railways. Priority area inspections and the discussion of all technical topics with the affected railways, which particularly rely on new information and accumulated experience, are a suitable method for increasing awareness at the railway undertakings of the issues being monitored.

# E. Safety certification and authorisation

## E.1 Guidelines

Those applying for safety certificates A/B can still rely on a guideline and related additional notes. The guideline had been in force unchanged since 24 August 2012. During the reporting year, the German Federal Railway Authority launched an update process, which was completed in 2018. The guidelines dated 01.04.2018 along with further information have been published on the German Federal Railway Authority website. Link:

<https://www.eba.bund.de/DE/Themen/Eisenbahnunternehmen/SiBe/sibe_node.html>

Since 23/04/2009, the ‘Guideline on the Issue of Safety Authorisations’ (version 1.0) has applied to the granting of safety authorisations. This guideline is also available on the EBA website. Link:

<https://www.eba.bund.de/SharedDocs/Downloads/DE/Infrastruktur/SiGe/Leitfaden_SiGe_23_04_2009.html>

## E.2 Contacts with other national safety authorities

An increased cooperation with foreign safety authorities was evident in 2017, in particular regarding re-certification of railway undertakings active in cross-border transport.

## E.3 Procedural aspects

No procedural anomalies can be reported for 2017. In all cases, differences in the processing of applications at individual undertakings are in every case caused by content-related aspects, or shortcomings of the application documentation. As for safety authorisations, the situation can be presented as follows: On 31.12.2017, a total of seven infrastructure managers had been granted a safety authorisation in accordance with § 7c AEG. One infrastructure manager holds a preliminary safety authorisation, in accordance with § 38 Abs. 5 c AEG.

## E.4 Feedback

The general administrative process in German provides applicants with the option of lodging an appeal once the decision has been issued, or lodging a complaint in a separate procedure. Applicants also have the option of submitting observations at any time during the processing of their applications As railway undertakings present in the market for years have already gone through certification repeatedly, it can be observed in the actions of the undertakings that the procedures are well-established.

In 2017, one company submitted a complaint due to being refused a safety certificate. The procedure has not yet been concluded. In addition to that, one company has appealed and lodged a complaint due to having a safety certificate withdrawn. These proceedings are also still underway.

# F. Changes to statutes and regulations

## F.1 Railway Safety Directive

Directive 2004/49/EC on safety on the Community’s railways has been implemented into national law in Germany. The relevant legal acts implementing Directive 2004/49/EC were as follows:

* Fifth Act Amending the Statutory Provisions Governing Railways of 16 April 2007 (BGBl. I p. 522), containing:
  + Amendment to the General Railway Act (Allgemeinen Eisenbahngesetzes - AEG); and
  + Amendment to the Federal Rail Traffic Management Act Bundeseisenbahnverkehrsverwaltungsgesetzes - (BEVVG).
* Second Regulation on the Enactment and Amendment of the Statutory Provisions Governing Railways [Zweite Verordnung zum Erlass und zur Änderung eisenbahnrechtlicher Vorschriften] dated 5 July 2007 BGBl. I p. 1305), containing:
  + Enactment of the Trans-European Railway Interoperability Regulation (Transeuropäische-Eisenbahn-Interoperabilitätsverordnung - TEIV),
  + Enactment of the Railway Safety Regulation (Eisenbahn-Sicherheitsverordnung - ESiV),
  + Enactment of the Railway Accident Investigation Regulation (Eisenbahn-Unfalluntersuchungsverordnung - EUV),
  + Amendment of the Railway Operations Manager Regulation (Eisenbahnbetriebsleiterverordnung - EBV),
  + Amendment to the Railway Operations Manager Examination Regulation (Eisenbahnbetriebsleiter-Prüfungsverordnung - EBPV),
  + Amendment to the Regulation on Access to the Occupation of Railway Entrepreneurs (Eisenbahnunternehmer-Berufszugangsverordnung - EBZugV),
  + Amendment to the Federal Railway Charges Regulation (Bundeseisenbahngebührenverordnung - BEGebv).

The same applies to the 2008, 2009 and 2014 amendments to this Directive, the implementation status of which appears in [Table 1 of Annex B](#_Tabelle_1:_Umsetzung_1).

## F.2 Changes in legislation and administrative regulations

[Table 2 of Annex B](#_Tabelle_2:_%C3%84nderungen) contains all the amendments to the national legal framework relating to railway safety (legal acts and administrative regulations) that were made in the reporting year.

# G. The application of CSM to risk evaluation and assessment

## G.1 Experience of the safety authority

Commission Regulation (EC) No 352/2009 of 24 April 2009 on the adoption of a common safety method for risk evaluation and assessment, as referred to in Article 6(3)(a) of Directive 2004/49/EC of the European Parliament and of the Council, has had binding effect since 1 July 2012. This Regulation was repealed as of 21 May 2015 and replaced by Regulation (EU) No 402/2013. The following areas already mentioned in the previous year show uncertainties from the point of view of the EBA:

* Interpretation of the terms ‘change’ and ‘significance’, in particular assessment criteria for examining significance and relevance to safety;
* Requirement for a reference system, possibly an explicit one, for risks identified in the simplified procedure.

The EBA does not perform a full review of all significance checks of the federal railways, as obligation to notifying or submit these does not exist in all cases. As part of its supervision, the EBA rather monitors the application of the CSM risk assessment and evaluation by random sampling, including significance checks carried out. In doing so, the EBA did not find any systematic deficits.

Infrastructure

The federal railways have generally applied their procedures for CSM risk evaluation and assessment in the reporting year and developed them further. The infrastructure managers submitted their documentations in relation to the application of the CSM procedure to the EBA for approval in individual cases, or as part of the construction of works, with consideration to stipulations such as exceptions and non-application in the case of insufficient significance.

Operations

It is also to be noted that the criteria of ‘significance’ and ‘safety relevance,’ which are not specified more precisely in the CSM risk evaluation and leave the undertakings considerable leeway in their handling of the process. Even the Federal Railway Authority can also only intervene in rare cases to correct administrative action, because these two legal terms cannot be interpreted as they are not sufficiently unambiguous for enforcement. An example for this is the integration of new transport activities or the initial operation of an undertaking into the method, including all possible scenarios for vehicle deployment, having them run on the network, and for operative duties during operation. Increasing practicability and safe actions e.g. by the corresponding training for undertakings and the authorities should be in the focus of the activities of the European Union Agency for Railways in relation to CSM risk evaluation in the future.

Vehicle licensing

The situation has not changed as regards the licensing of vehicles. The framework is determined by the Administrative Regulation on Authorisation for Placing Railway Rolling Stock in Service (Verwaltungsvorschrift für die Inbetriebnahmegenehmigung von Eisenbahnfahrzeugen - VV IBG), the guideline on CSM Risk Evaluation and Assessment and Rolling Stock Safety Regulations (Sicherheits-Regelwerk Fahrzeuge - SIRF). The VV IBG has annexes, which may serve as a template for the safety assessment report in accordance with the CSM. The procedure outlined therein is used for authorisations to place new vehicles in service and for notifications/authorisations for placing in service of modifications to existing vehicles. In addition to the use of the risk assessment when placing vehicles into service within the framework of the VV IBG, the ‘Sector Agreement MoU on Vehicle Licensing’ also stipulates the use of the CSM risk assessment when licensing vehicles. As a rule, the applicants submit the documents envisaged in the ‘MoU on Vehicle Licensing’ (result of safety assessment report and related declaration): for all significant changes, a risk management procedure must be applied and a declaration must be given that the result of the safety assessment report confirm that the relevant risks have been identified by all suitable methods and the implemented measures for verification sufficiently cover all risks arising from the significant change. Where Regulation (EU) No 402/2013 is applied, this is done in the proposer’s written declaration under Article 16 of that Regulation.

Vehicle monitoring

When carrying out vehicle monitoring, the German Federal Railway Authority also considers the way in which the CSM applies risk assessment. In doing so, uncertainty continues to arise with regard to the correct procedure. As in previous years, the basic obligation to apply risk assessment in the case of a number of actors is not supported by appropriate processes. As a result, these actors only applied the CSM and identified the necessity to incorporate it into their processes when asked to do so by the Federal Railway Authority.

## G.2 Feedback from providers

A formal feedback procedure has still not been introduced (e.g. use of questionnaires). The affected undertakings did not report directly to the EBA on any experience with the application of CSM for the evaluation and assessment of risks. A survey of the undertakings in the form of interviews still shows that they do not have a unified understanding of the method and its management.

## G.3 Revision of national safety regulations to take account of the Commission Regulation on CSM for risk evaluation and assessment

No special national safety regulations to take account of the Commission Regulation on CSM for risk evaluation and assessment have been enacted in Germany. This was not necessary. Instead, the current EU Regulation is being directly applied.

# H. Application of CSM monitoring

Regulation (EU) No 1078/2012 of 16 November 2012 on a common safety method for monitoring to be applied by railway undertakings, infrastructure managers after receiving a safety certificate or safety authorisation and by entities in charge of maintenance (‘CSM Monitoring’) entered into force on 7 June 2013. The Regulation describes the requirements for the internal monitoring of the safety management system by the undertakings themselves.

Infrastructure

The EBA monitors the establishment and effectiveness of internal monitoring procedures which are generally a component of the SMS by, on the basis of random sampling,

* comparing the results of internal audits that the railway operations managers (EBL) carry out with the findings from the supervision activities of the EBA pursuant to Regulation (EU) No 1077/2012;
* participating in the railway operations managers' (EBL) audits at the bodies performing the maintenance.

As in the previous year, the findings of the EBA fundamentally correspond to those of the EBLs. Accordingly, there are no negative findings as regards the manner of functioning of the monitoring procedures of the EIUs.

As the internal monitoring procedure generally forms part of the SMS, a check also takes place on the basis of the criteria set out in Regulation (EU) No 1169/2011 in the context of the granting of the safety authorisation pursuant to Section 7(c) AEG. Where deficits are identified, the EBA reports these to the undertaking concerned in the context of the authorisation procedure. However, a complete substantive review of all processes does not take place, since the examination is generally limited to the existence of processes and, in certain cases, fundamental plausibility.

Rolling stock / Operations

Experience from monitoring shows that application of this shared safety method still remains difficult for undertakings. First, this involves the technical integration of the method in relation to the SMS and its scheduling as individual tasks in the management. The undertakings require corresponding competence for this in order to abstractly handle managerial duties. Second, the appropriate consideration to and the regular work with the method also requires appropriate resources.

In part, the EBA had issued decisions which, where there were known to be a cluster of certain shortcomings, required the companies to draw up and implement action plans in accordance with Article 3 of Regulation 1078/2012. This demonstrated some success in 2017.

# I. Exceptions to the ECM certification system

In this reporting year, the EBA has issued no exceptions pursuant to Article 14(a)(8) of Directive 2004/49/EC regarding the method for certifying the entity in charge of maintenance (ECM). Therefore, there was no need to define alternative measures.

# ANNEX A: Common Safety Indicators

**Safety indicators in accordance with Annex I to the Railway Safety Directive (Directive 2004/49/EC)**

1. Indicators relating to accidents
   1. **Total number of significant accidents and average number of significant accidents (per million train-kilometres), broken down into the following types of accident**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All types of accident | Collisions of trains with a rail vehicle | Collisions of trains with an obstacle within the clearance gauge | Train derailments | Level crossing accidents including accidents involving pedestrians | Accidents resulting in injury, in which a moving train is involved, with the exception of suicides and suicide attempts. | Vehicle fires | Other accidents |
| Total | 346 | 3 | 35 | 8 | 73 | 198 | 0 | 29 |
| Average number | 0.323 | 0.003 | 0.033 | 0.007 | 0.068 | 0.185 | 0.000 | 0.027 |

Level crossing accidents including accidents involving pedestrians and average number of these accidents (per million train-kilometres), broken down into the following types of accident

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | passively protected level crossing [6.2 a)] | active level crossing, manual  [6.2 b) i)] | actively protected level crossing, automatic with user-side warning  [6.2 b) ii)] | actively protected level crossing, automatic with user-side protection  [6.2 b) iii)] | actively protected level crossing with trackside protection [6.2 b) iv)] |
| Total | 17 | 3 | 13 | 34 | 6 |
| Average number | 0.016 | 0.003 | 0.012 | 0.032 | 0.006 |

* 1. **Total number and average number (per million train-kilometres) of serious injuries and fatalities by type of accident, broken down into the following categories**
     1. Seriously injured persons

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All types of accident | Collisions of trains with a rail vehicle | Collisions of trains with an obstacle within the clearance gauge | Train derailments | Level crossing accidents including accidents involving pedestrians | Accidents resulting in injury, in which a moving train is involved, with the exception of suicides and suicide attempts. | Vehicle fires | Other accidents |
| Total number of seriously injured persons | 165 | 37 | 3 | 1 | 34 | 88 | 0 | 2 |
| Average number of seriously injured persons | 0.154 | 0.034 | 0.003 | 0.001 | 0.032 | 0.082 | 0.000 | 0.002 |

Of which:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Passengers | 41 | 35 | 0 | 0 | 0 | 6 | 0 | 0 |
| Average number of seriously injured passengers | 0.038 | 0.033 | 0.000 | 0.000 | 0.000 | 0.006 | 0.000 | 0.000 |
| Average number of seriously injured passengers per billion passenger-kilometres | 0.431 | 0.368 | 0.000 | 0.000 | 0.000 | 0.063 | 0.000 | 0.000 |
| Average number of seriously injured passengers per million passenger train-kilometres | 0.051 | 0.044 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 |
| Employees or contractors | 21 | 2 | 3 | 1 | 3 | 10 | 0 | 2 |
| Average number of seriously injured employees, including contractors | 0.020 | 0.002 | 0.003 | 0.001 | 0.003 | 0.009 | 0.000 | 0.002 |
| Level crossing users | 31 | 0 | 0 | 0 | 31 | 0 | 0 | 0 |
| Average number of seriously injured level crossing users | 0.029 | 0.000 | 0.000 | 0.000 | 0.029 | 0.000 | 0.000 | 0.000 |
| Trespassers | 60 | 0 | 0 | 0 | 0 | 60 | 0 | 0 |
| Average number of seriously injured trespassers on railway premises | 0.056 | 0.000 | 0.000 | 0.000 | 0.000 | 0.056 | 0.000 | 0.000 |
| Other persons on platforms | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| Average number of seriously injured other persons on platforms | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.000 | 0.000 |
| Other persons not on platforms | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Average number of seriously injured other persons not on platforms | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |

* + 1. Fatalities

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All types of accident | Collisions of trains with a rail vehicle | Collisions of trains with an obstacle within the clearance gauge | Train derailments | Level crossing accidents including accidents involving pedestrians | Accidents leading to personal injury involving a moving railway vehicle, excluding suicide and suicide attempts | Vehicle fires | Other accidents |
| Total number of fatalities | 157 | 0 | 0 | 0 | 44 | 113 | 0 | 0 |
| Average number of fatalities | 0.146 | 0.000 | 0.000 | 0.000 | 0.041 | 0.105 | 0.000 | 0.000 |

Of which:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Passengers | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Average number of passengers killed | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |
| Average number of passengers killed per billion passenger-kilometres | 0.021 | 0.000 | 0.000 | 0.000 | 0.000 | 0.021 | 0.000 | 0.000 |
| Average number of passengers killed per million passenger train-kilometres | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |
| Employees or contractors | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| Average number of employees, including contractors, killed | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.000 | 0.000 |
| Level crossing users | 44 | 0 | 0 | 0 | 44 | 0 | 0 | 0 |
| Average number of level crossing users killed | 0.041 | 0.000 | 0.000 | 0.000 | 0.041 | 0.000 | 0.000 | 0.000 |
| Trespassers on railway premises | 93 | 0 | 0 | 0 | 0 | 93 | 0 | 0 |
| Average number of trespassers on railway premises killed | 0.087 | 0.000 | 0.000 | 0.000 | 0.000 | 0.087 | 0.000 | 0.000 |
| Other persons on platforms | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 |
| Average number of other fatalities on platforms | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 |
| Other persons not on platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average number of other fatalities not on platforms | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

1. Indicators relating to dangerous goods

Total number and average number (per million train-kilometres) of accidents in relation to the transport of dangerous goods, broken down into the following categories

|  |  |  |
| --- | --- | --- |
|  | Accidents in which at least one rail vehicle carrying dangerous goods was involved | Accidents in which dangerous goods were released |
| Total | 2 | 8 |
| Average number | 0.002 | 0.007 |

1. Indicators relating to suicides

Total and average number (per million train-kilometres) of suicides

|  |  |  |
| --- | --- | --- |
|  | Suicides | Suicide attempts |
| Total | 771 | 97 |
| Average number | 0.719 | 0.090 |

1. Indicators relating to incidents and near misses

Total number and average number (per million train-kilometres) of incidents and near misses, broken down into the following categories

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All incidents and near misses | Broken rails (only EIU) | Buckled rails and other track layout failures (only EIU) | Signalling errors (only EIU) | Signals passed at danger with the danger point being reached | Signals passed at danger without the danger point being reached | Broken wheels | Axle and wheelset axle breakages |
| Total | 845 | 284 | 17 | 1 | 112 | 431 | 0 | 0 |
| Average number | 0.788 | 0.265 | 0.016 | 0.001 | 0.104 | 0.402 | 0.000 | 0.000 |

1. Indicators relating to the consequences of accidents

Total amount in EUR and total delay in minutes and average values (per million train kilometres) for

|  |  |  |
| --- | --- | --- |
|  | Costs of damage to rolling stock and infrastructure | Costs of damage to the environment |
| Total costs | 58,244,772 | 175,000 |
| Average costs | 54,293.916 | 163.129 |

|  |  |  |
| --- | --- | --- |
|  | Minutes of delay in passenger transport | Minutes of delay in freight transport |
| Minutes of delay total | 92,387 | 171,519 |
| Minutes of delay average | 115.093 | 665.905 |

1. Indicators relating to technical safety of infrastructure and its implementation
   1. **Train protection systems**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | warning | warning and automatic stopping | Warning and automatic stopping as well as section-by-section speed monitoring | Warning and automatic stopping as well as continuous speed monitoring |  |
| Percentage of lines with automatic train protection (EIUs only) | 1.6% | 1.7% | 88.5% | 8.0% |  |
| Percentage of train-kilometres travelled for which on-board train protection systems are used | 0.0% | 1.0% | 85.4% | 13.5% | \* |

* 1. **Number of level crossings (in total, per line kilometre and per track kilometre), broken down into the following five types (only for EIU):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | manual | automatic with user warning | automatic with user protection | with trackside protection |
| Actively protected level crossings | 1,087 | 724 | 6,932 | 1,039 |
| Average number per line kilometre | 0.032 | 0.022 | 0.207 | 0.031 |
| Average number per track kilometre | 0.018 | 0.012 | 0.114 | 0.017 |

|  |  |
| --- | --- |
|  | Total |
| Passively protected level crossings | 4,202 |
| Average number per  kilometre of line | 0.126 |
| Average number per track kilometre | 0.069 |

\* The train-kilometres travelled using on-board train protection systems are available for only some of the railway undertakings. These undertakings together provide approximately 70% of train-kilometres.

# ANNEX B: Amended legal provisions

## Table 1: Implementation of the amendments to Directive 2004/49/EC

|  |  |  |  |
| --- | --- | --- | --- |
| **amendments to Directive 2004/49/EC** | **Implemented (Yes/No)** | **Main legislative act** | **Date of entry into force** |
| Directive 2008/57/EC | Yes | Eighth Act Amending the Statutory Provisions Governing Railways of 12 September 2012 (BGBl. I p. 1421) | 18.09.2012 |
| Seventh Act Amending the Statutory Provisions Governing Railways of 10 December 2012 (BGBl. I p. 2632) | 20.12.2012 |
| Eighth Act Amending the Statutory Provisions Governing Railways of 22 November 2013 (BGBl. I p. 4008) | 29.11.2013 |
| Directive 2008/110/EC | Yes | Eighth Act Amending the Statutory Provisions Governing Railways of 12 September 2012 (BGBl. I p. 1421) | 18.09.2012 |
| Directive 2009/149/EC | Yes | Fifth Regulation on the Enactment and Amendment of the Statutory Provisions Governing Railways dated 29.04.2011 (BGBl. I p. 705) | 07.05.2011 |
| Directive 2014/88/EU | Yes | Ninth Regulation on the Amendment of the Statutory Provisions Governing Railways dated 19.11.2015 (BGBl. I p. 2105) | 01.01.2016 |

## Table 2: Changes to the national legal framework during 2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Legal and administrative regulations** | **Provision** | **Date of entry into force** | **Description of the main change** | **Reasons for the change** |
| Concerns railway undertakings / infrastructure managers / ECMs | Gesetz zur Neuordnung der Eisenbahnunfalluntersuchung (German Federal Act on the Reorganisation of Railway Accident Investigations) of 27.06.2017 (BGBl. I p. 2085) | 05.07.2017 | Amendments to the Allgemeinen Eisenbahngesetzes (AEG) (German Railway Act), as well as to the Bundeseisenbahnverkehrsverwaltungsgesetztes (BEVVG) (German Federal Rail Traffic Management Act):  Establishing the BEU (German Federal Office for Railway Accident Investigations) |  |
| Concerns railway undertakings / infrastructure managers / ECMs | Eighth Act Amending the Statutory Provisions Governing Railways of 26/07/2017 (BGBl. I p. 3054) | 03.12.2015 and 01.01.2016 | Railway Construction and Operation Code (*Eisenbahn-Bau- und Betriebsordnung*, EBO):   * Amendment to §32(3) EBO (Ordinance on the Construction and Operation of Railways), regarding setting deadlines for maintenance to be carried out by the ECM.   Traction Vehicle Driver's Licence Checking Regulation (TfV):   * Option for exemptions from language requirements on cross-border lines. | Defining the obligations arising from Directive 2004/49/EC, as well as harmonisation with AEG.  Directive 2007/59/EC |

# ANNEX C – Abbreviations

|  |  |
| --- | --- |
| AEG | General Railways Act [*Allgemeines Eisenbahngesetz*] |
| AsBo | Assessment Body |
| BEGebV | Regulation on Fees and Charges of the Federal Railway Administrations (Federal Railway Fees Regulation) [*Verordnung über die Gebühren und Auslagen der Eisenbahnverkehrsverwaltungen des Bundes (Bundeseisenbahngebührenverordnung)*] |
| BEU | Federal Office for Railway Accident Investigation [*Bundesstelle für Eisenbahnunfalluntersuchung*] |
| BEVVG | Federal Rail Traffic Management Act [*Gesetz über die Eisenbahnverkehrsverwaltung des Bundes (Bundeseisenbahnverkehrsverwaltungsgesetz)*] |
| BGBl | Federal Gazette [*Bundesgesetzblatt]* |
| BÜ | Level crossing [*Bahnübergang*] |
| CSI | Common Safety Indicators |
| CSM | Common Safety Methods |
| DeBo | Designated Body |
| EBA | Federal Railway Authority [*Eisenbahn-Bundesamt*] |
| EBL | Railway Operating Manager [*Eisenbahnbetriebsleiter*] |
| EBO | Railway Construction and Operation Code (Eisenbahn-Bau- und Betriebsordnung) |
| EBPV | Regulation on the Examination for Railway Operations Managers [*Verordnung über die Prüfung zum Betriebsleiter für Eisenbahnen*] |
| EBV | Regulation on the Appointment, Confirmation, Tasks and Powers of Railway Operations Managers [*Verordnung über die Bestellung und Bestätigung sowie die Aufgaben und Befugnisse von Betriebsleitern für Eisenbahnen*] |
| EBZugV | Regulation on Access to the Profession of Railway Entrepreneur [*Eisenbahnunternehmer-Berufszugangsverordnung*] |
| ECM | Entity in charge of maintenance |
| EC | European Community |
| ESiV | Railway Safety Regulation [*Verordnung über die Sicherheit des Eisenbahnwesens (Eisenbahn-Sicherheitsverordnung)*] |
| EU | European Union |
| EUV | Regulation on the Investigation of Dangerous Occurrences in Railway Operations [*Verordnung über die Untersuchung gefährlicher Ereignisse im Eisenbahnbetrieb*] |
| EVU | Railway Undertaking |
| GSM-R | Global System for Mobile Communications – Rail |
| ICE | Intercity-Express |
| MoU | Memorandum of Understanding |
| NoBo | Notified Body Interoperability |
| PRINS | Project maintenance |
| PZB | Intermittent automatic train control |
| RL | Guideline [*Richtlinie*] |
| Dir | Deutsche Bahn Group Guideline |
| SIRF | Rolling Stock Safety Regulations [*Sicherheits-Regelwerk Fahrzeuge*] |
| STE | Signalling, telecommunication and electrical engineering [*Signaltechnik, Telekommunikation und* *Elektrotechnik*] |
| TEIV | Trans-European Railway Interoperability Regulation [*Verordnung über die Interoperabilität des* *transeuropäischen Eisenbahnsystems (Transeuropäische-Eisenbahn-Interoperabilitätsverordnung)*] |
| TSI | Technical Specification for Interoperability |
| VDV | Verband Deutscher Verkehrsunternehmen e. V. (Association of German Transport Undertakings) |
| VO | Regulation [*Verordnung*] |
| VV IBG | Administrative Regulation on Authorisation for Placing Rolling Stock in Service [*Verwaltungsvorschrift über die Inbetriebnahmegenehmigung von Eisenbahnfahrzeugen*] |
| Zs | Subsidiary signal |

1. Under Directive 2004/49/EC, ‘significant accidents’ involve at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage (at least EUR 150 000) to stock, track, other installations or environment, or extensive disruptions to traffic (suspension of train services on a main railway line for six hours or more). [↑](#footnote-ref-2)