Eisenbahn-Bundesamt

Report of the Federal Railway Authority

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

Reporting Year 2013

Eisenbahn-Bundesamt

Published by:

Federal Railway Authority [Eisenbahn-Bundesamt]

Heinemannstraße 6

53175 Bonn

Germany

www.eisenbahn-bundesamt.de

As at: 31.08.2014

Contents

A. Scope of the report

The Federal Railway Authority [Eisenbahn-Bundesamt] (EBA) is the safety authority for the railways in Germany and is responsible for carrying out the duties of a national safety authority as specified under Article16 of Directive 2004/49/EC (the "Railway Safety Directive"):

- issuing authorisations to place structural subsystems into service in accordance with directives on the interoperability of the rail system within the Community (in accordance with Directive 2008/57/EC);

- supervising compliance of the subsystems of the railway system with the essential requirements for operation and maintenance and likewise for the interoperability constituents;

- issuing authorisations to place rolling stock that is not yet covered by a technical specification for interoperability (TSI) into service;

- issuing safety certificates for railway undertakings and safety authorisations for infrastructure managers;

- monitoring and developing the safety regulatory framework including the system of national safety rules;

- registering vehicles in the national vehicle register.

In addition, the EBA performs other tasks such as, for example, planning the federal railways' operating facilities, helping to finance construction work under the Federal Railway Development Act [Bundesschienenwegeausbaugesetz] (BSWAG), work in the field of dangerous goods, activities involved with the enforcement of Regulation (EC) No 1371/2007 on the rights and obligations of railway passengers (the EBA is also responsible for passenger rights for ship and bus traffic), and planning, approving and acting as the supervisory authority for magnetic levitation railways.

In accordance with Article 18 of the Railway Safety Directive, this report is restricted to the EBA's activities as a safety authority, in particular the development of:
- railway safety, including the common safety indicators (CSIs);
- the legislative and regulatory framework supporting railway safety;
- safety certification and safety authorisation as well as
- the body of knowledge obtained from the supervision of railway undertakings.

The structure of this report follows the template recommended by the European Railway Agency (ERA).

B. Introductory section

1. General remarks

This annual report provides information on the activities carried out by the EBA as the German railway safety authority. It is primarily aimed at the railway community in Germany and Europe, but its target audience extends beyond that to include representatives from politics, business and the press from other sectors and interested members of the general public.

The EBA was set up as an independent, unitary higher federal authority within the Federal Ministry of Transport when the railway system was restructured in 1994. It is the supervisory and licensing authority for the federal railways [Eisenbahnen des Bundes] (EdB), magnetic levitation railways and railway undertakings (EVUs) based in other States for the territory of the Federal Republic of Germany. In addition to network-based supervision in accordance with Article 5(1)(c) of the General Railways Act [Allgemeines Eisenbahngesetz] (AEG), the EBA is also responsible for supervising non-federally owned railways which require a safety certificate or safety authorisation.

2. Railway structure information

On 31 December 2013, the public railway network in Germany consisted of a total of approximately 38 000 route km, of which about 20 500 km were electrified by the standard electricity system in Germany (at 15 kV, 16⅔ Hz). This network is operated by a total of around 180 licensed public railway infrastructure managers (EIUs). Over 32 000 km of track alone is operated by DB Netz AG, the largest infrastructure manager in Germany.

At the end of 2012, some 430 public railway undertakings (EVUs) were licensed under Article 6 of the General Railways Act to provide transport services by rail on Germany's public railway network. This is equivalent to a licence under Directive 2012/34/EU (formerly 95/18/EC) establishing a single European railway area. In addition, railway undertakings from other States operate in Germany on the basis of a licence issued in another Member State of the European Union in accordance with Directive 2012/34/EU (95/18/EC).

In 2013, after a slight decline in 2012, the positive trend seen between 2010 and 2011 returned. The German economy grew at a nominal rate of 2.2% and the quantity of goods transported (+1.7%) and the volume of goods traffic (+1.1%) also rose. Rail and inland shipping did markedly better here than road transport from the rise in transport volume. In the modal split between various forms of land transport carriers (road, rail, inland shipping), rail's share increased slightly to 18.0% over the course of the year.[1]

[1] Source: Federal Office for Freight Traffic, Market Research in Freight Traffic [Bundesamt für Güterverkehr, Marktbeobachtung Güterverkehr] – Annual Report 2013

In 2013, public railways carried some 373.7 million tonnes of freight (+2.1% compared to the previous year). Volumes transported likewise rose by 2.3% to 112.6 billion tonne km. The rise in volumes transported is largely down to combined traffic. Levels of traffic in 2014 are still expected to show a slight improvement, it being possible that rail transport will improve to a greater extent proportionally.[2]

Passenger traffic by rail grew inconsistently. The number of people transported increased by 1.4% over the course of the year to 2.58 billion passengers. Over the same period, however, transportation volumes fell slightly from 88.8 to 88.5 billion passenger kilometres (-0.3%). This means that the mean transportation distance fell slightly both in short- and long-distance traffic.[3]

3. General trend analysis

In 2013, there were a total of 301 significant railway accidents on that part of the railway network in Germany which is subject to the Railway Safety Directive[4]. The number of significant accidents therefore remains at the level seen in previous years (from 2007 to 2012 the number of significant accidents was between 285 and 329). Compared to the previous year, there has been an increase in the number of accidents in the categories of collisions, derailments, "accidents involving personal injury" and "other accidents", whereas there have been far fewer accidents on level crossings. The number of vehicle fires remained stable at a very low level.

The total number of fatalities caused by railway accidents continued to fall slightly (2010: 146 fatalities; 2011: 140 fatalities; 2012: 138 fatalities; 2013: 137 fatalities). The number of serious injuries also fell to 107 people compared to 115 seriously injured people the previous year (-7%).

Annexes

A map of the railway network in Germany is attached to this report as an annex (**Annex A.1**). Links to the lists of licensed railway undertakings and infrastructure managers are also to be found therein (**Annex A.2**).

[2] Source: Federal Office for Freight Traffic, Market Research in Freight Traffic [Bundesamt für Güterverkehr, Marktbeobachtung Güterverkehr] – Annual Report 2013
[3] Source: Federal Statistical Office [Statistisches Bundesamt], Technical series 8, Number 1.1, 07/2014, Table 2.1.1
[4] Pursuant to Directive 2004/49/EC (as amended) ‘significant accident’ means any accident resulting in at least one killed or seriously injured person or damage equivalent to EUR 150,000 or more or suspension of services for six hours or more.

C. Organisation

In accordance with Article 2(1) of the statute governing the administration of the federal railways, the Federal Rail Traffic Management Act [Bundeseisenbahnverkehrsverwaltungsgesetz] (BEVVG), the EBA is an independent, unitary, higher federal authority within the Federal Ministry of Transport and Digital Infrastructure (BMVI).

Article 3 BEVVG defines the specific tasks of the EBA in detail. Accordingly, the EBA is responsible for the following tasks:

1. approving plans for operational facilities for the federal railways;
2. acting as the supervisory authority;
3. supervising construction of operational facilities for the federal railways;
4. issuing and revoking operating licences;
5. exercising sovereign powers as well as supervisory and participation rights in accordance with other laws and regulations;
6. preparing and implementing agreements in accordance with Article 9 of the Federal Railway Development Act [Bundesschienenwegausbaugesetz (BSchwAG)];
7. technical investigation of dangerous incidents in railway operations in accordance with Article 5(1)(g) of the General Railways Act;
8. allocating federal funds to promote rail transport and to promote multimodality, combining rail transport with other means of transport.

To carry out its tasks, the EBA has a head office in Bonn and twelve outstations in fifteen locations throughout Germany. The EBA's head office has four departments (Head Office Services, Infrastructure, Rolling Stock and Operations, and the Finance Department). There are seventeen subordinate units. There are also specialist departments responsible for authority management, an Interoperability / International Affairs Certification Department and a National Passenger Rights / Tariff Monitoring Enforcement Department. The local tasks are carried out by five technical departments in the twelve outstations. They are coordinated by the respective specialist units at the head office. An organisation chart of the EBA and an overview of the outstation locations are given in **Annex B**.

The EBA has been set up as a higher federal authority under auspices of the BMVI. It is therefore answerable to that ministry. In addition to the EBA, three other bodies have responsibilities for railway activities in Germany:

The **Federal Railway Accident Investigation Office (EUB)** [Eisenbahn-Unfalluntersuchungsstelle des Bundes] is the investigating body for the purposes of Directive 2004/49/EC. The EUB manages and is responsible for the investigation of accidents on infrastructure which the Federal Republic supervises in accordance with Chapter V of the Railway Safety Directive. The BMVI provides the management of the EUB but its activities are carried out by an investigation centre within the EBA which reports functionally to the BMVI.

The **Federal Network Agency (BNetzA)** [Bundesnetzagentur] is the regulatory body in accordance with Directive 2012/34/EU (formerly 2001/14/EC) and as such it monitors non-discriminatory network access in Germany. The Federal Network Agency also regulates the electricity, gas, postal and telecommunications markets and is therefore organisationally answerable to the Federal Ministry for the Economy and Energy [Bundesministerium für Wirtschaft und Energie]. However, specialist regulation of railway activities is the responsibility of the BMVI.

Eisenbahn-Cert (EBC) is the notified body for interoperability in accordance with Directive 2008/57/EC on the interoperability of the rail system within the Community and as such it checks and certifies compliance with the European rules for interoperability components and subsystems of the rail system.

A schematic representation of the situation as at 31 December 2013 is attached to this annual report as **Annex B.2**.

D. The development of railway safety

Initiatives to maintain and improve the level of safety

This section contains a list of the measures decided upon by the EBA or implemented in Germany in 2013 to maintain or improve safety on the railways. EBA measures based on specific events, such as accidents, are shown in Table D.1.1, whilst measures triggered by other factors (such as findings during inspections) are shown in Table D.1.2.

Table D.1.1. Safety measures triggered by accidents or precursors to accidents

Accidents/precursors which triggered the measure			Safety measure decided upon
Date	**Place**	**Description of the event**	
Effectiveness of intermittent automatic train control in an active magnetic track brake			
24.09.2013	Leipzig-Dresden	In an active magnetic track brake, influences from intermittent automatic train control (PZB) are not registered in the vehicle.	An adjustment was first made through operational instruction of the railway undertaking concerned. When vehicles are newly built, the magnetic track brake and PZB magnet are not supposed to be arranged directly next to one another; the EBA has published a technical notice to that effect (Technical Notice 05/2014, available at www.eba.bund.de). Whether it is necessary for existing vehicles or infrastructural installations to be modified is currently being looked at by a working group from the electromagnetic compatibility team to which relevant representatives of the railway sector and the EBA are party.
Sand impairing the effectiveness of track circuits			
22.02.2013	Itzehoe	Through the sanding of railway rolling stock, in both cases an insulation effect was created and the effectiveness of track circuits was thereby impaired.	The scope of the operational measures already ordered by the EBA the previous year in respect of all railway undertakings (see, in respect hereof, also the 2012 report) was extended to include all journeys.
01.08.2013	Mainz		

Stability of aluminium pylons			
25.07.2013	Siegburg	A lighting pylon made of aluminium collapsed. After a similar pylon had already collapsed in 2011, a number of discussions and hearings were held on this subject.	The cause in both cases was corrosion. After the first pylon collapsed, the infrastructure manager concerned implemented a series of measures to establish the causes and prevent similar incidents. An action algorithm was set out in a set of technical instructions: 1. Establishment of recognisable mechanical damage; if damage is spotted replace, if not continue to 2. Examination of whether there are any plastic sleeves; if so carry out a (non-destructive) examination on a 10% sample using the LIMAtest, if not continue to 3. Visual check of whether there are any grey protective bandages provided 30 cm above platform surface; if so carry out LIMAtest on 10%, if not continue to 4. 100% LIMAtest. The non-destructive LIMAtest was carried out on approx. 4 000 aluminium pylons and the pylons were designated as stable. The pylon which collapsed in 2013 was estimated as being stable until 2021 following this 2011 test. As an immediate measure, all comparable pylons in Siegburg were supported. In addition, a procedure to investigate and remedy possible causes was agreed between the infrastructure manager and the EBA. As Siegburg is what is referred to as a modular platform and a tram passing underneath (direct current) could be an influencing factor, a series of investigations were required which have not yet been completed and are being continued in 2014. At the same time, the infrastructure manager concerned will look at other non-destructive methods of investigation in order then to revise the maintenance plan. Neither new nor replaced aluminium pylons are being used in the meantime.

Table D.1.2. Safety measures with other triggers

Description of the area of concern	Description of the trigger	Safety measure decided upon
Protection against fire and disaster		
Planning, construction and operation of railways	Experience has shown that it is sensible to set specific requirements in order to guarantee the safety level standardised under Article 4(3) AEG with regard to protection against fire and disaster in said area (open section).	Issue of the guideline "Requirements for protection against fire and disaster in the planning, construction and operation of railways according to AEG", available at http://www.eba.bund.de/DE/HauptNavi/Infrastruktur/IOH-Anlagen/Ingenieurbau/ingenieurbau_node.html
Calculations of interference of signal boxes missing or not up to date		
Control-command and signalling subsystem, here: Signal boxes	As was already reported in 2012, it was discovered during the railway inspection that the absolutely essential calculations of interference were often missing or not up to date (in 75% of the signal boxes concerned).	The infrastructure manager in question was instructed to present a schedule showing signal boxes to be investigated prioritised as a function of danger, to monitor its implementation from the centre and to report to the EBA on a monthly basis. The calculations have since largely been concluded in accordance with the agreed schedule. Any measures still to be implemented are the subject of activities in 2014.
ICE 3 wheelset bearing		
Rolling stock subsystem; wheelset	In the case of rolling stock from the ICE 3 series, damage to bearings with similar characteristics arose as a result of overstressing.	Reduction in the maximum mileage and intervals between maintenance by the railway undertaking in question. The introduction of new diagnostic technology is planned and is currently being agreed between EVUs and EIUs.
BR 403/406 air cushion failures		
Rolling stock subsystem; suspension	During a railway inspection, insufficient action was discovered in operation and maintenance in relation to recognisable damage to the air cushion system in rolling stock from the 403/406 series.	Revision of the rules on dealing with air cushion failures by the railway undertaking in question.
MD 33-36 series bogies		
Rolling stock subsystem; bogie	The final and absolute general regulations of the EBA from 2001 no longer corresponded to the applicable legal standards.	Revision and supplementation of the general regulations in line with the current legal position. The general regulations may be viewed at http://www.eba.bund.de/SharedDocs/Publikationen/DE/GesetzeundRegelwerk/Allgemeinverf/32_allgvfg_MD-Drehgestelle2.pdf

Calculations of interference in signal boxes on electrified lines		
Control-command and signalling subsystem: signal boxes on electrified lines	In the event of new construction and rebuilding of control and safety technology installations or when a change is made to circuits, a check on interference by the electromagnetic environment must be made. This has been laid down in the regulations applicable since 1996 as a must since both the ability of the installation to function and also human safety can be compromised. During a railway inspection, the EBA found that these calculations were often missing.	A request for information was ordered. The outcome was that, of the 1 970 signal boxes across the Federal Republic, no calculation or no up-to-date calculation was available for some 75%. Hence it could not be guaranteed that any necessary protective measures had been taken. Since the procedures can no more ensure compliance than can the obligation set down in the regulations applicable since 1996, implementation is to be monitored more strictly internally. The infrastructure manager in question was instructed to present a schedule showing signal boxes to be investigated prioritised as a function of danger, to monitor its implementation internally from the centre and to report to the EBA on a monthly basis. Agreed date for the termination of the calculations is the end of 2013 (or March 2014 in the case of some installations with a low level of risk).
Defects in three-layer motor relays		
Control-command and signalling subsystem: Three-layer motor relays	During a railway inspection, it was found that a three-layer motor relay was not in an 'occupied' position despite occupation of the section by a train. The block relay had fallen owing to the lack of a 'danger' position. The reason for this was that a dust-protection frame which had slipped off was blocking the two indicators of the respective position. The older series three-layer motor relay found had a latest series connector and was provided with additional holes on the baseplate in order to be able to secure the plastic housing of the latest series motor relay. Using the latest plastic housing on the old baseplate results in an impermissibly large distance between the plastic housing and the test terminal block which allows displacement of the cover frame and therefore blocking of the motor relay. The relay therefore did not meet the standards of the regulatory drawings.	The infrastructure manager in question was ordered to ascertain the number of three-layer motor relays concerned as soon as possible and replace them with three-layer motor relays that complied with the regulations. It was found that two-layer motor relays were not affected by this problem. Replacement of the three-layer motor relays concerned with relays that complied with the regulations was completed at the end of August 2013.

Detailed data trend analysis

Annex 1 of the Railway Safety Directive specifies the common safety indicators (CSIs) on which the safety authorities are to report in their annual reports. The various categories of CSIs include:

- number of significant accidents;
- number of fatalities;
- number of persons injured;
- number of accidents related to dangerous goods;
- number of suicides;
- number of precursors to accidents;
- consequences of accidents (costs and delays);
- technical safety of the infrastructure and its implementation together with safety management.

Since 2007, the data on which the common safety indicators are based has been taken from the safety reports made to the EBA by the railways. The data source for 2006 was the database of dangerous incidents reported to the EBA. The threshold for recording accidents since 2007 has met the criteria introduced in Directive 2009/149/EC amending Directive 2004/49/EC of the European Parliament and of the Council as regards common safety indicators and common methods to calculate accident costs. Accordingly, only significant accidents are included: those are accidents in which at least one moving railway vehicle is involved and in which

- at least one person was killed or seriously injured; or
- significant damage was caused to rolling stock, tracks, other installations or the environment (damage that is equivalent to EUR 150 000 or more); or
- there was extensive disruption to operations (suspension of services on a main line for six or more hours).

As a result, the accident figures reported for 2007 et seq. have fallen sharply by comparison with those for 2006; as absolute figures, they cannot be compared with the 2006 values. That becomes very clear in the collisions, derailments and vehicle fires categories. It is therefore only possible to use the CSIs to analyse trends since 2007. The definition to be used for broken rails also changed in 2007. From that date broken rails which did not pose an actual danger have also had to be included and that has led to an increase in the number of broken rails in 2007 and subsequently. In accordance with the definition used for the purposes of the CSIs, with effect from 2009 signals passed at danger only include events linked to train running. Hence the number of cases of signals passed at danger has fallen sharply compared with previous years.

The CSIs for accidents, fatalities and people seriously injured were coordinated with figures from Federal Statistical Office sources. The scope of the data cannot be aligned precisely since the Federal Statistical Office considers all the public railways

in Germany, whilst the common safety indicators specified in Directive 2004/49/EC for reporting purposes only include those from undertakings which require a safety certificate or safety authorisation. For that reason the number of accidents reported by the Federal Statistical Office is higher than the CSI values given in this report.

In 2013, there were a total of 301 significant railway accidents on that part of the railway network in Germany which is subject to the Railway Safety Directive. Accordingly, the number of significant accidents has risen slightly again although it is still below the average level between 2007 and 2012.

The number of people seriously injured in railway accidents in 2013, at 107 people, was well below the figure for the previous year (115 seriously injured, -7%) and also below the average level over previous years. It is at its lowest level since CSI records began. The number of seriously injured passengers has fallen year on year from 9 to 6. Nearly 60% of all seriously injured people are level crossing users or unauthorised persons on railway premises. This group also saw a reduction. By contrast, the number of people seriously injured in railway accidents who were employees rose sharply.

The total number of the people who died in railway accidents fell slightly from 138 in 2012 to 137 in 2013. About 90% of all fatalities are in the ‘level crossing users’ and ‘unauthorised persons on railway premises' categories. Well over half the total number of people killed was unauthorised persons on railway premises (66%). A detailed examination reveals that changes in the individual categories varied: In the area of users of level crossings there was a sharp fall, while the number of passengers, employees and other people killed in each case fell only slightly. By contrast, the number of unauthorised persons killed rose sharply, almost completely offsetting the falls in the other categories. On a positive note, it should be emphasised that no passengers were killed in a railway accident in 2013.

Details of the economic consequences 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 damage to property and environmental damage as well as a calculation of the costs resulting from delays and the costs and societal losses through victims of accidents. The values used in the calculations were derived from the results of the 'HEATCO' Project. This project was commissioned by the EU to work out a basis for the economic assessment of infrastructure projects and was recommended by the European Railway Agency; for further details, see http://heatco.ier.uni-stuttgart.de.

The data for the individual CSIs for 2013 and the definitions used for calculating the CSIs are provided in **Annex C** of this report.

Results of safety recommendations

The following section contains the results of and measures proposed in relation to safety recommendations of the Federal Railway Accident Investigation Office.

2013 safety recommendations

Train derailment between Gröbers and Großkugel on 11.02.2011
As a result of the train derailment caused by track location errors, the following safety recommendation was announced: With respect to the standard deviation of the overall signal of the longitudinal level, mutual altitude and height of camber calculated over 250 m at intervals of 25 m, Directive 821.2001 stipulates no values at which maintenance measures have to be carried out. However, revision is required such that the assessment measures SR 100, SRlim or limit values are likewise set for the standard deviation.
A similar cause of accident is also presumed in respect of the derailments at Lorch/Rhein on 09.06.2013 and at Oldenburg on 01.07.2013. Model calculations were then ordered. The findings should also be used in further deliberations over any necessary change to the rules. However, they have not yet been provided. The process has therefore not yet been completed.

Vehicle fire in Berlin Ostbahnhof on 26.07.2011
This incident resulted in the safety recommendation to check whether, for traction vehicles from the structurally similar 112, 114 and 143 series, measures should be put in place which increase fire safety on the conductor rails and traction motor clamping points (in particular traction motor clamping points 1 and 4) and prevent impermissibly high transfer resistances and differing power distribution.
The process has not yet been completed.

Train collision between Werlau and St. Goar on 11.09.2011
The safety recommendation stated as follows:
1. In a risk assessment, the likelihoods of any occurrence and the amounts of rainfall to be expected in the future (instances of heavy rainfall triggering the event) should be estimated. Then, gutters/drainage facilities along with associated drainage basins should be checked in order to identify and implement any additional safety measures that may be required.
2. Creation of "another telecommunications link" according to Ril 408.0581 to provide an emergency stop request by train personnel on stretches without telephones.

The following state of affairs in respect of these safety recommendations can be reported:
On point 1.
To the knowledge of the EBA, all instances of rockfalls and mudflows attributable to heavy rainfall over recent years started on areas of land that are not owned by the EIU. Nevertheless, the (sloping) areas of land adjoining the operational facilities are jointly inspected by the EIU. If defects are discovered, the owner is notified and asked to remedy the situation. If there is any imminent danger, the EIU remedies the defect itself.
Numerous checks of the EIU's facilities managers by the EBA have shown during railway supervision that the planned inspections are carried out regularly. In addition, surveys of the slopes on either side of the Rhine have been and are carried out by a building ground institute. On the basis of this survey, the slopes are graded for poten-

tial danger. This grading forms the basis of further geological investigations and measures and of inspections by the EIU in question.
On point 2.
In its rules regarding technical access to the network, the infrastructure manager has taken account of requirements set out in safety recommendations. The EBA monitors whether the EVUs implement further measures and whether these are plausible; this applies, in particular, to alternative communication channels to avoid operational hazards.

Train collision in Bleicherode on 21.09.2011
As a result of the investigation, it was recommended that it be checked whether automatic track clear notification devices should be provided in the main lines passing through stations.
For the station in Bleicherode, as part of the planning for the provision of an electronic signal box in Wolkramshausen, the intention is to equip it with track clear notification devices. A basic examination of the need for any retrofitting of track clear notification devices in the existing network has already been carried out after an earlier accident (collision in Berlin-Karow, cf. 2010 report). The conclusion reached in the risk assessment carried out at the time is being adhered to.

Level crossing accident between Lübbecke and Espelkamp on 09.01.2013
This safety recommendation contained the following aspects:
1. The signs of the guards to stop road traffic should also be given after the provision of auxiliary equipment. This requirement should be specified in Ril 456 and the clear use of the term "auxiliary equipment" revised in the corresponding Annexes 2 and 5.
2. In the case of plannable or relatively lengthy decommissioning of level crossing protection devices and installations for protection through guards, the risk of any error on the part of the guard that has safety implications should be identified in order to determine an acceptable maximum period of guard protection and establish this for the future.
3. In the case of plannable or relatively lengthy decommissioning, coordination should be carried out with the transport authorities (special level crossing inspection).
4. In the case of plannable or relatively lengthy decommissioning, mobile barrier systems with light signals and half-barriers (e.g. TH BÜP model) for easier visibility of guard protection for road users should be used more often. In connection herewith, the rules on the provisions of signals should be changed.
5. For the purposes of protection and to make them easier to see, guards should wear high-visibility clothing that is easier to see (Class 3, at least vest and trousers).
6. Invalid light signals should only ever be covered up using means corresponding to the Technical Notice. Visibility of auxiliary equipment should be improved.
7. In the case of plannable or relatively lengthy decommissioning, more mobile lighting should be used when it is dark if this makes the crossing area easier to see, even if the rules have not previously prescribed level crossing lighting.

From the EBA's point of view, the following state of affairs in respect of the individual aspects of the safety recommendation can be reported:

On point 1.
The EIU in question has implemented the measures that are possible according to the Road Traffic Act and put corresponding internal rules in place.
On point 2.
Investigations are ongoing. The process in relation hereto has not yet been completed.
On point 3.
The road traffic authorities are invited to carry out regular traffic inspections. Special traffic inspections may be requested by any crossing partner. Requests are to be decided upon on a case-by-case basis.
On point 4.
There is now a second supplier of mobile barrier systems so the availability of such systems should be improved and the rate of use should increase. Discussions on changing the rules on the provision of signals are ongoing; innovations such as a mobile reflective folding pyramid (cf. 6.) or reflective barriers tapes are also under development. The process has not yet been completed.
On point 5.
The EIU in question has implemented corresponding measures.
On point 6.
The current rule on covering up light signals is set out in a Technical Notice. As supplementary equipment, the EIU in question has since developed a mobile reflective folding pyramid with a red light on top and presented it to the BMVI. There are no real concerns over this. Use can now begin in practice.
On point 7.
Implementation has to be decided upon by the EIU in each individual case, possibly in consultation with the road maintenance authority.

Safety recommendations from previous years

In some cases further information is available on safety recommendations shown in annual reports from previous years which had not been completely discharged at the time of publication:

After the collision of an ICE and the derailment which followed in Landrücken Tunnel, the following recommendation, inter alia, was made in 2010:

- consider whether it is possible to continue to do without fencing of the line or parts of the line, or whether similar events can in future be prevented by other methods so as to improve the margin of safety against derailment for high speed trains;

Wildlife fences have since been erected at the Landrücken Tunnel. Additional relevant sections of the line have been identified.

As a result of the investigation of a derailment on the line from Nürnberg-Stein to the Nürnberg marshalling yard (Nürnberg Rbf) it was recommended that permanent way regulations for the inspection of track and switch installations of type K-54-B58 be updated and supplemented in the near future:

1. Lay down a graduated inspection frequency for testing the tension of securing fittings on track and switches. In deciding the categories, line speed, traffic densi-

ty and sensitive locations on the network (for example tight bends, track on timber sleepers that have been there a long time, permanent way with ‘indirect fastenings’ and other constraints) should be taken into consideration.

2. Establish a method of testing to check the tension of securing fittings and appropriate test values. The measurement of design tension by means of a torque wrench, for example, would be considered as a suitable test.

The EBA and the EIU in question have discussed the facts. A change to the regulations was decided upon as an action point which was carried out in 2013 in the form of a Technical Construction Specification. The latter stipulated the following regarding damage found at rail support points which are secured with two sleeper screws to sleeper types B 55 or B 58:

1. If there is damage (including broken-off or damaged sleeper screws, loose sleeper mounting points), immediate repair is to be carried out on bends of less than 800 m. If this is not possible, as a replacement measure, a temporary speed restriction with a maximum permissible speed of 30 km/h is to be imposed. The line is to be closed if the stability of the track is threatened and cannot be guaranteed even through the use of track fixture devices.
2. If there is damage on bends of more than 800 m and on straight sections, an additional inspection is to be carried out in which the state of tensioning is checked and the extent of repair necessary is determined and fixed. Immediate repair work is to be started or, if this is impossible, a temporary speed restriction with a maximum speed of 30 km/h is to be imposed as a replacement measure.

E. Important changes in legislation and regulations

The following changes to the statutory framework for railways relating to railway safety were made in Germany in the course of 2013:

Eighth Regulation Amending the Statutory Provisions Governing Railways

[Achte Verordnung zur Änderung eisenbahnrechtlicher Vorschriften]

With the Eighth Regulation Amending the Statutory Provisions Governing Railways of 22 November 2013 (BGBl. I p. 4008, which came into force on 29 November 2013), the following statutory changes were implemented:

- The Regulation over Theoretical Checking of the Obtaining of a Traction Vehicle Driver's Licence (Traction Vehicle Driver's Licence Checking Regulation – TfPV) came into force;
- the new Article 8(a) of the Traction Vehicle Driver's Licence Regulation (TfV) contains rules on obtaining, storing and using personal data for identification purposes;
- the Trans-European Railway Interoperability Regulation (TEIV), with its new Article 7(b), now contains rules on the licensing of vehicle types, and the scope of application was also specified in Article 1(3);
- the Federal Railway Fees Regulation (BEGebV) was given the official fees belonging to the vehicle type licence introduced in the TEIV.

The table in Annex D contains an overview in tabular form of the changes made 2013.

F. The development of safety certification and authorisation

1. Numerical data

Annex E contains a summary of various numerical data on safety certificates and safety authorisations.

2. Procedural aspects

General

The EBA charges fees for the work it does in issuing Part A and Part B Safety Certificates and safety authorisations. These fees are determined by the length of time required to handle the application. In accordance with Article 2(2) of the Federal Railway Fees Regulation (BEGebV) the rate per hour was EUR 100 in 2013.

2.1. Part A Safety Certificates

In 2013, no amendments or revisions were made to Part A Safety Certificates.

Within the period covered by the report, no enquiries by safety authorities from other countries were received in connection with Part A Safety Certificates which had been issued in Germany. No problems arose with respect to the use of harmonised formats for Part A Safety Certificates or the mutual recognition of Part A Safety Certificates.

Formal feedback procedures for EVUs to comment on the process for issuing safety certificates are not required under either the Railway Safety Directive or its transposition into national legislation. However, undertakings are free to submit their views on the procedures informally. Action through the courts is also an option available to all undertakings. The following problems were mentioned by undertakings:

- understanding the distinction between safety-related objectives of a safety management system compared with a quality management system;
- responsibility for, and control of, the risks arising from services and resources provided by suppliers, service providers and contractual partners.

2.2. Part B Safety Certificates

In 2013, no revisions were made to Part B Safety Certificates.

No problems arose in connection with the use of harmonised formats for Part B Safety Certificates. The EBA does not consider there to have been any particular difficulties with the application process.

There is no provision for a formal feedback procedure for Part B Safety Certificates either, although undertakings can submit their views informally at any time.

2.3. Safety authorisations

No new applications for the granting of safety authorisations were received by the EBA in 2013.

Of the previously received applications, at the end of the 2013 financial year five were still being processed because checks could not be completed (in four cases owing to missing or incomplete application documents and in one case owing to administrative court proceedings), as a result of which the time frame sought under Article 12(1) of Directive 2004/49/EC could not be adhered to. For the undertakings in question, provisional authorisation is valid until a final and binding decision has been reached according to Article 38(5)(c) AEG.

There was no feedback from EIUs in 2013 within the framework of a formalised feedback procedure.

G. Supervision of railway undertakings and infrastructure managers

The following section explains how railway undertakings and infrastructure managers in Germany were supervised by the Federal Railway Authority in 2013. In 2013, there were about 210 staff available to the Federal Railway Authority to supervise in the areas described below.

Supervision of permanent way and structural installations

Monitoring of infrastructure managers to ensure that installations meet prescribed standards and that infrastructure managers comply with the regulations for the inspection and servicing of installations is carried out in the EBA as part of the process of supervision of permanent way and structural installations. The railway supervisory process makes use of sampling techniques to establish whether the General Railways Act, the statutory regulations associated with it and recognised engineering rules are complied with when approved equipment is being used. Checking that the railways are meeting the safety obligations laid down in Article 4(3) of the General Railways Act is a key task in railway supervision. General monitoring during the railway supervisory process is basically limited to sampling checks. In this process, the EBA distinguishes between three kinds of monitoring in accordance with the Administrative Regulation on the Inspection of Structural Installations of the Federal Railways [Verwaltungsvorschrift zur Eisenbahnaufsicht über die baulichen Anlagen der Eisenbahnen des Bundes, VV EA]:
a) monitoring of undertakings [unternehmenbezogene Überwachung (ubÜ)];
b) monitoring of installations [objektbezogene Überwachung (obÜ)];
c) special monitoring [Sonderüberwachungen].

The VV EA can be viewed on and downloaded from the Internet at the following address:
VV EA auf www.eisenbahn-bundesamt.de

These types of checks are supplemented as appropriate by audits of key areas. The approach adopted when shaping the process of supervising permanent way and structural installations facilitates the systematic evaluation of the supervised EIU's maintenance organisation and processes geared to specific types of installation. The division into three described above represents an approach to evaluating the maintenance activities of the EIU which is as flexible and reliable as possible.

As far as the individual types of monitoring are concerned:

a) Monitoring of undertakings is intended to determine the extent to which existing regulations – largely internal to the undertaking – for maintenance within the meaning of DIN 30541 (servicing, inspection, repair) have been implemented and observed. As a consequence, it assesses the operator's maintenance organisation by evaluating the organisations responsible for the installations and es-

sentially represents an audit of the maintenance organisation. This type of monitoring is carried out at regular intervals (about every two years).

b) Monitoring of installations is carried out through sampling by observing the inspections of the installation by the operator. It enables an assessment of the condition of the installation to be made on site as well as the monitoring of the staff involved in maintenance. Monitoring of installations is also carried out regularly for the various types of maintenance work.

c) The EBA reserves the right to carry out special inspections in those cases where the monitoring of undertakings and/or installations does not permit an unambiguous assessment of an installation. Special inspections may also be scheduled, inter alia, after accidents or exceptional events.

In addition to the forms of monitoring described above, the EBA looks at the basic question of whether the railway undertakings are consistently meeting their obligation to provide and properly implement safety management so that all risks associated with their activities are controlled and the particular requirements for safe design, maintenance and operation of the railways are met. This includes ensuring that

- the requirements applicable to the granting of any safety authorisation (defined in Annex II of Regulation No 1169/2010) are always met and, if necessary, the processes and methods are updated to ensure a process of continual improvement and
- Regulation (EU) No 1078/2012 for internal checks of the EIU is applied (e.g. railway manager audits).

This monitoring is also referred to as safety authorisation supervision (SMS).

No significant deficiencies in the maintenance system of the federal railways were found in the course of monitoring permanent way and structural installations in 2013. Only for a small proportion of the individual installations monitored was it necessary to give instructions to the infrastructure managers.

Two targeted inspections were carried out in the 2013 financial year:

1. Rescue areas, access points, access routes and entries to tunnels;
2. Defects in track geometry and replacement measures.

Both targeted inspections served to provide a representative picture of the frequency and development of defects in said areas.

Supervision of signalling, telecommunications and electrical installations

The procedure for inspecting signalling, telecommunications and electrical equipment (STE installations) is set down in the ‘VV EA-STE’ administrative instructions. It uses a risk and fault-based approach for the inspection of installations which takes account of their importance in safety terms and the frequency of faults. The administrative instructions are available online:
VV EA-STE auf www.eisenbahn-bundesamt.de
The procedure uses dependable statistical methodology. It achieves a very high 'hit rate' with representative samples to assess the quality of maintenance achieved by the operator of the installation. This allows deficiencies to be recognised with certainty, followed up and evaluated. In addition to the systematic sampling test of the

installations, a regional and nationwide programme of undertaking and installation inspections on various subjects is carried out.

The combination of the statistically based mandatory programme and the themed special focus programme allows the EBA to make efficient use of its resources to fulfil its remit to protect society from danger. Thus, particularly hazardous areas can be targeted, critical areas such as EIU's maintenance management systems can be investigated effectively and those faults and deficiencies which are found can be dealt with quickly throughout the country.

A uniform national administrative approach is guaranteed by defining the content and extent of tests in test guidelines (checklists for each technology). All the data captured from the statistical tests are fed into a newly designed database and evaluated. The latter allows rapid identification of new areas requiring action. At least as important are the verifiable and statistically defensible findings on the defects in the maintenance organisation that arise from this work, i.e. processes which are lacking or not carried out. In discussions that take place annually, the findings which are summarised in the annual reports are discussed both centrally and by the infrastructure managers on site with the EIU managers there. The objectives and commitments decided at that time can then be verified in a comprehensible way so that a process of continuous improvement is created.

Normal monitoring (mandatory programme), safety register

Annually updated mandatory sampling figures for Section 3 in the safety register form a key part of normal monitoring in accordance with Article 6(a) VV EA-STE. There are some fifty significant types of installation evaluated in terms of the following safety criteria:

- extent of damage;
- age of type of installation;
- wear;
- servicing cost and probability of making errors in maintenance;
- failure mode and fault rate;
- disclosure of failure.

Following this categorisation of safety assessments into high, middle or slight, the reliability desired for the sampling is decided as 99%, 95% or 90%. The number of samples by technology and year is derived from the total number of types of installation and the reliability of the results desired. Hence, the supervisory actions of the EBA are focused on those technologies which contain the greatest potential risk or where the hazards are least well-controlled (including within the meaning of Annex III point 4 of Regulation (EU) No 1169/2010). The actions are ascribed to individual EIUs. Checking the quality of maintenance of the EIU is therefore based on process- and object-related inspection of the specific infrastructure which can be understood in detailed terms.

The following procedural changes were introduced in 2013:
Regulation (EU) No 1077/2012 describes the duties of monitoring after the granting of safety authorisation by the safety authority. Monitoring the maintenance of STE installations has already been carried out by means of VV EA-STE 01 since 2010

largely in accordance with this regulation. The basic principles of Regulation VO (EC) No 1077/2012 have already essentially been taken into account in VV EA-STE 01 and are now being updated in certain areas. The isolated changes introduced in 2013 relate, for example, to:

- changes to the terminology and wording of Regulation (EU) No 1077/2012;
- monitoring of the safety management systems of the EIU;
- structuring of the reporting procedure (annual reports based on experience, discussion procedures and the provision of results, in particular with respect to a targeted evaluation of national monitoring results for rounds of talks with the EIUs held at central and regional levels);
- Handling of defects and levying of fees resulting therefrom.

General results:
The rate of defects out of all EIUs monitored by the EBA in relation to STE was on average low, so safe maintenance is essentially found to be carried out. There is also evidence of a process of continual improvement. The main problem area is and remains, and is unfortunately becoming more prevalent, the lack of any or of any up-to-date working plans which makes carrying out the correct maintenance measures more difficult to begin with. The second most common problem is inspections not being carried out in good time, and this is tending to be more prevalent too. Looking at all of the EIUs, procedural checks revealed further deficiencies not related to engineering:

- availability of documents on required measurements / functional checks;
- documented remedying of safety-relevant defects;
- availability, currentness and completeness of essential inventory documents,
- timely and complete performance of inspections.

Unfortunately, as has been evident for some years already, one EIU showed a significant requirement for improvement by comparison with the others. The proportion of defects relating to all the points tested is significantly higher than for other EIUs being monitored. Although the EIU announced a series of measures, its proportion of defects in the EBA's samples rose again in 2013 compared to the previous year.

Inspection of railway vehicles

The frequency and scope of the inspections of railway vehicles depend on the quality and the extent of the EVU's compliance with all their technical and statutory obligations. The EBA uses a system-based approach to determine the extent to which the party responsible for the condition of a vehicle (EVU, vehicle owner or ECM) meets their statutory obligations under Article 4(1) and (3) and Article 4(a) AEG in relation to the safe construction and safe condition of rolling stock.
Based on that approach, the EBA:

- checks organisation- and undertaking-related systems;
- checks systems relating to vehicle type and design series; and
- checks specific installations.

When checking organisation-related systems, the procedures, responsibilities and structures stipulated and applied by railways supervised by the Federal Railway Au-

thority to ensure rolling stock is safe to operate are checked to ensure their effectiveness is plausible. When carrying out system audits of vehicle types and series, examinations are adapted to suit the vehicle type and design series.
The aim of checks on specific installations is to compare the actual and desired condition of vehicles in accordance with the relevant legal provisions and recognised rules of engineering (depending on the vehicle) and to examine process-related factors like the existence of evidence or the implementation of safety management systems in relation to the vehicle. In addition to preventative vehicle inspection, inspection ‘for cause’ as a reactive inspection process forms a further part of vehicle supervision. The aim of inspection ‘for cause’ is to protect against dangers in individual cases should this prove necessary after an investigation into the facts of a case. The existing monitoring plan was revised in various areas with respect to the application of CSM Regulation 1077/2012/EU during the reporting period. The strategy being pursued involves all specialist units with monitoring responsibilities adopting the same approach; it is nevertheless still the case that all three pillars of vehicle monitoring can be applied.

In 2013, in addition to issues carried over from previous years, wheelsets and bogies on various types of vehicle became a key area of inspection ‘for cause’. In many cases, dialogue with those involved made it possible to dispense with issuing official instructions. The technical discussion on how to take account of operational influences on axles were held at European level with the significant involvement of the EBA.

Official controls on dangerous goods (according to 1.8.1 RID)

In addition to the specifications of railway law in respect of railway undertakings, further regulations have been laid down in Germany regarding the transportation of dangerous goods under dangerous goods legislation. These are the Transport of Dangerous Goods Act (Gesetz über die Beförderung gefährlicher Güter, GGBefG) and, based thereon, the Order on the Transportation of Dangerous Goods by Road, Rail and Inland Shipping (Gefahrgutverordnung Straße, Eisenbahn und Binnenschifffahrt, GGVSEB), which mainly lay down the powers and duties of the respective transport carriers. By means of the GGVSEB, the "Order for the International Transport of Dangerous Goods by Rail" (Ordnung für die internationale Eisenbahnbeförderung gefährlicher Güter, RID) is also incorporated into German law. The RID sets out the provisions specifically to be observed when transporting dangerous goods by rail.
In order to monitor compliance with these provisions, the EBA carries out dangerous goods checks on vehicles carrying dangerous goods. The EBA primarily checks dangerous goods vehicles at railway yards, preferably where the dangerous good is being dispatched. Based on special administrative agreements with two Federal States, certain checks are also carried out within operations. Joint checks are also carried out with other responsible authorities of Federal States, e.g. trade control, or in neighbouring foreign countries, here with the Swiss or Dutch supervisory authorities.

Dangerous goods checks are also carried out when Class 7 radioactive materials are being transported. Measurements are also taken here, amongst other things, to check compliance with international limits for contamination and dose rate.

If the EBA discovers breaches of dangerous goods law when carrying out its checks, the parties responsible are informed and instructed to remedy the breaches. If necessary for safety reasons, the EBA prohibits onward travel until the defect has been remedied. In the event of larger or repeated complaints, the EBA carries out investigations of the facts relating to the checks, what are referred to as "duty of care checks", of the undertakings involved in the transportation of the dangerous goods, in particular at the premises of the senders, fillers, etc. These breaches are based on the GGVSEB ("has to ensure that").

In summary of the dangerous goods checks carried out in 2013, it can be stated that the complaint rate has levelled off at a pleasing 5 to 7% and that no overfilling has been discovered for years. In 2014, closer checks should be carried out on shipments from abroad as there has been a higher level of complaints in this area.

Operational railway supervision

Operational railway supervision is carried out within the EBA. Fundamentally, it involves making checks on undertakings by carrying out process- and object-related inspections and special inspections. These process and product audits are intended to monitor organisation and documentation together with the functioning of the undertakings' safety management systems and to check that the operators are meeting their safety responsibilities. In doing so, an assessment is also made of whether EVUs are continuing to develop their safety management systems to make them ever more effective and whether they are reacting appropriately, on their own initiative, to lessons learned from dangerous incidents.

The procedures which railway undertakings use to evaluate and control the risks of railway operation represent a further core issue when it comes to carrying out checks. In this area, railway undertakings must demonstrate that they are able to evaluate the effects of changes in their operations on levels of safety and to take appropriate compensatory action as necessary. Where undertakings note non-conformities with the requirements of their safety management systems they are to manage them through their continuous improvement processes.

The checking of installations extends, amongst other things, to the following areas:
1. leading organisational units of the EIUs and EVUs with strategic responsibilities to exercise operator responsibility,
2. EIUs' and EVUs' organisational units with staff and traffic management tasks which have implications for operational safety;
3. organisational units of local operations managers of EIUs and EVUs;
4. organisational units with the task of investigating incidents during rail operations;
5. staffed locations for the operation of signalling equipment and safety installations on site (for example, signal boxes and barrier boxes);
6. locations with the task of train formation, handling and preparation;

7. visiting sites and travelling along sections of line on inspection journeys;
8. visual inspections of standard rolling stock and track plant and their loads;
9. accompanying the driver in the cab of rail vehicles;
10. travelling in passenger trains to investigate safety devices, external doors of passenger coaches and the departure procedure;
11. areas of work within the hazardous area on and around the track and ensuring railway operations are protected from danger.

Particular areas where monitoring was focused as a result of experience and risk-based considerations during the reporting period were:

1. The EBA looked more closely at operational procedures and the interaction of the parties involved during construction and maintenance work on the railway infrastructure and safety-relevant processes for the organisation of simultaneous travel and construction. Particular attention was focused here on how a culture of safety is established in all (often external) undertakings participating in construction and maintenance in order to control risks during construction operations and how undertakings communicate and comply with safety rules.
2. On a number of occasions, the procedures and processes required for the safe organisation of business cooperation and involvement of third parties were monitored to check that there was sufficient organisational responsibility. The EBA is continually endeavouring to raise awareness among those responsible of their remaining overall responsibility.
3. Increasing numbers of operational staff are taken from personnel service providers or other undertakings, often at short notice. The EBA is checking more closely that these members of staff are also informed, in a procedure-safe manner, both of the internal rules applicable to the train of the respective EVU which are of importance for ensuring a safe journey, and the sets of operational rules and framework conditions applicable on the network. Examples of this are individual regulations to be laid down by railway undertakings with respect to train preparation, the securing of vehicles, internal communication channels, powers of functionaries and decision-making powers for dealing with technical defects in a vehicle.

H. Application of the common safety method (CSM) of risk evaluation and assessment

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 been mandatory since 1 July 2012. The transitional provision defined in Article 2(4) of Regulation (EC) No 352/2009 for projects which are at an advanced stage of development continued to apply at least to projects being developed in 2013. Representative experience of dealing with safety evaluation reports from independent evaluation bodies is therefore not yet available.

Infrastructure:
In 2013, the federal railways applied and continued to develop their processes for CSM risk evaluation and assessment. As far as the EBA is aware, there has been uncertainty, for example, over tests of significance.

A full review of all tests of significance of the federal railways is not being carried out because, particularly in the case of measures which do not require authorisation, there is no duty of evidence or submission; the EBA monitors the application of CSM risk evaluation and assessment on a sampling basis during supervision and also includes tests of significance carried out herein. It was found that the majority of measures by the railways were graded as insignificant changes within the railway system. The few safety assessment reports on significant changes submitted to the EBA indicate good processing quality and were usually accepted.

Vehicles
As regards rolling stock, the ‘Rolling Stock Safety Regulations’ [Sicherheits-Regelwerk Fahrzeuge (SIRF)] were added to the ‘Administrative Regulation on Authorisation for Placing Railway Rolling Stock into Service’ [Verwaltungsvorschrift für die Inbetriebnahmegenehmigung von Eisenbahnfahrzeugen (VV IBG)] and the ‘Manual on CSM Risk Evaluation and Assessment’ [Leitfaden zur CSM Risikoevaluierung und –bewertung] in 2011 and were updated in 2012. Annexes to the VV IBG were also drawn up; these annexes may serve as a template for the safety assessment report according to the CSM. The procedure which it outlines is used for the authorisation to place new vehicles into service and notification and authorisation of modifications to existing vehicles. In addition to the use of risk assessment when putting vehicles into service (IBG) within the framework of the VV IBG, the "Sector Agreement MoU on Vehicle Licensing" [Sektorvereinbarung MoU Fahrzeugzulassung"] also stipulates, from the middle of 2013, the use of CSM risk assessment when licensing vehicles.

I. Exceptions to the ECM certification system

Rules on exceptions according to Article 14(a)(8) of Directive 2004/49/EC regarding the method for certifying the entity in charge of maintenance (ECM) have not been issued by the certification body. There has therefore also been no need to lay down alternative measures.

J. Conclusions – Priorities

The supervisory work carried out by the Federal Railway Authority in 2013 against a background of stable safety levels again showed no serious safety deficiencies on the part of railway undertakings and infrastructure managers. Taken over several years, the frequency with which such deficiencies are found has remained fairly constant, so they do not allow us to conclude any critical impact on the level of safety. Considering the actual trend in accidents in recent years together with the increasing traffic flows on the German rail network, once again the level of safety in railway operations can be said to be stable.

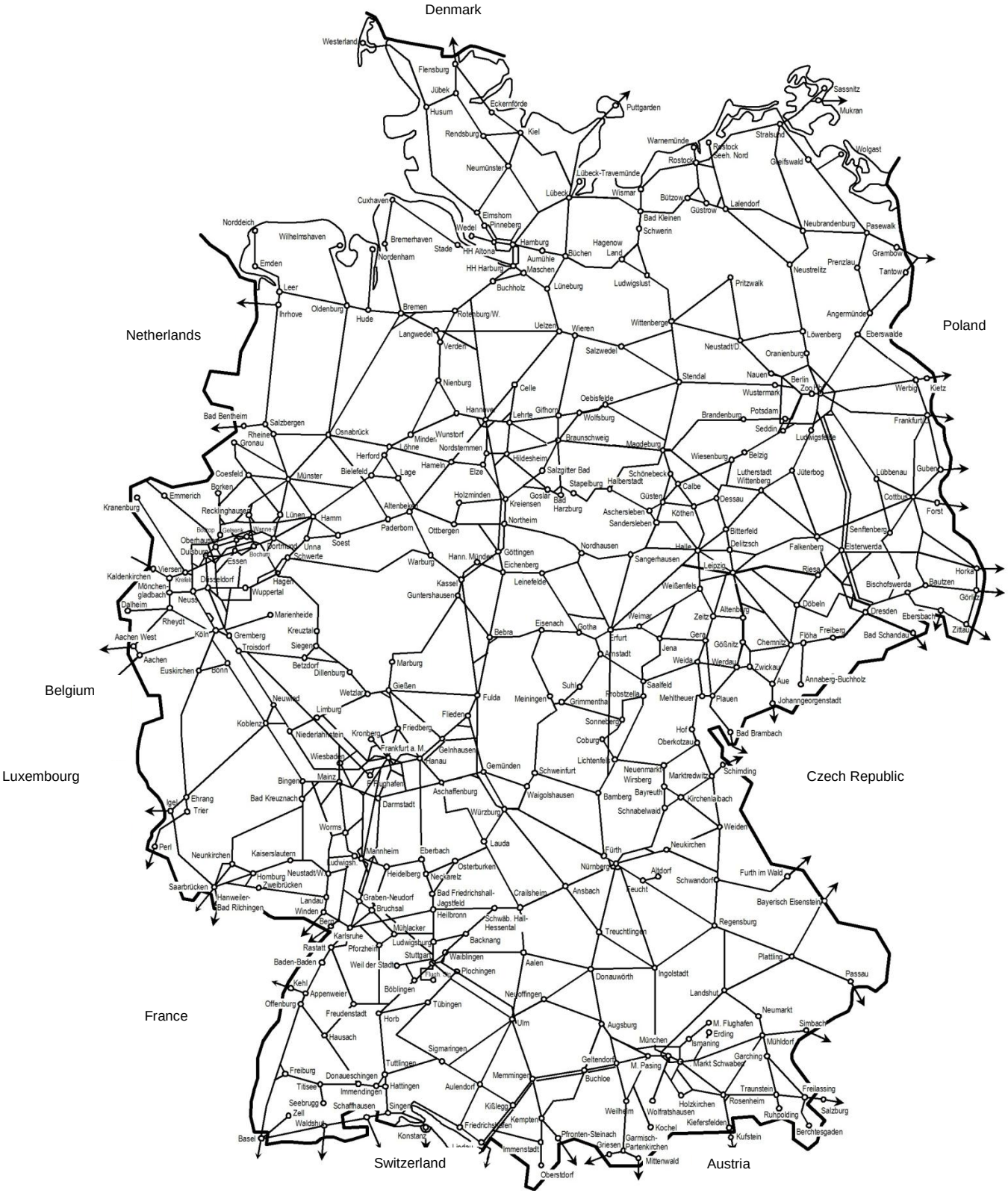
Where deficiencies that had safety implications were discovered, the EBA issued instructions for the proper maintenance of railway installations and rolling stock and for operations to be run safely in accordance with Article 2(4) of the Railway Construction and Operation Order (EBO). The main initiatives and measures taken to maintain and improve safety are summarised in Section D, Part 1. On the basis of the findings from 2013, no further targeted inspections were ordered for 2014 over and above routine monitoring with the same emphasis as hitherto.

The reorganisation of railway supervision of permanent way structural installations introduced at the beginning of 2010 has allowed a better assessment of the condition of infrastructure managers' maintenance organisation and is proving to be a key factor in evaluating the effectiveness and operation of safety management systems. Further development of the techniques for processing the results in order to evaluate the continuous improvement process, evaluation of the effectiveness of safety management systems and monitoring of compliance with guidelines and ancillary provisions which arise from the safety authorisations issued was further continued in the 2013 financial year. On 1.1.2014, it was therefore possible for a revised version of the administrative instructions applicable during the reporting period (1.1.2013 – 31.12.2013) to come into force, these now also containing the new elements of monitoring regarding safety management systems. The standard evaluation of results of railway supervision and their presentation to the EIUs being supervised is a further key issue in the further development of process-oriented railway supervision. The findings to date have shown that documentation of installation data is a key defect in maintenance processes. During final discussions at the end of the respective monitoring periods, amongst other things, these results were communicated to the EIUs in question and corresponding measures were agreed.

K. Annexes

ANNEX A: Railway structure information

A.1. Network map



A.2. Lists of EIUs and EVUs

Up-to-date lists of public EIUs and EVUs – as well as much other information – may be found on the Federal Railway Authority website.

A.2.1. A.2.1. List of public EIUs in Germany

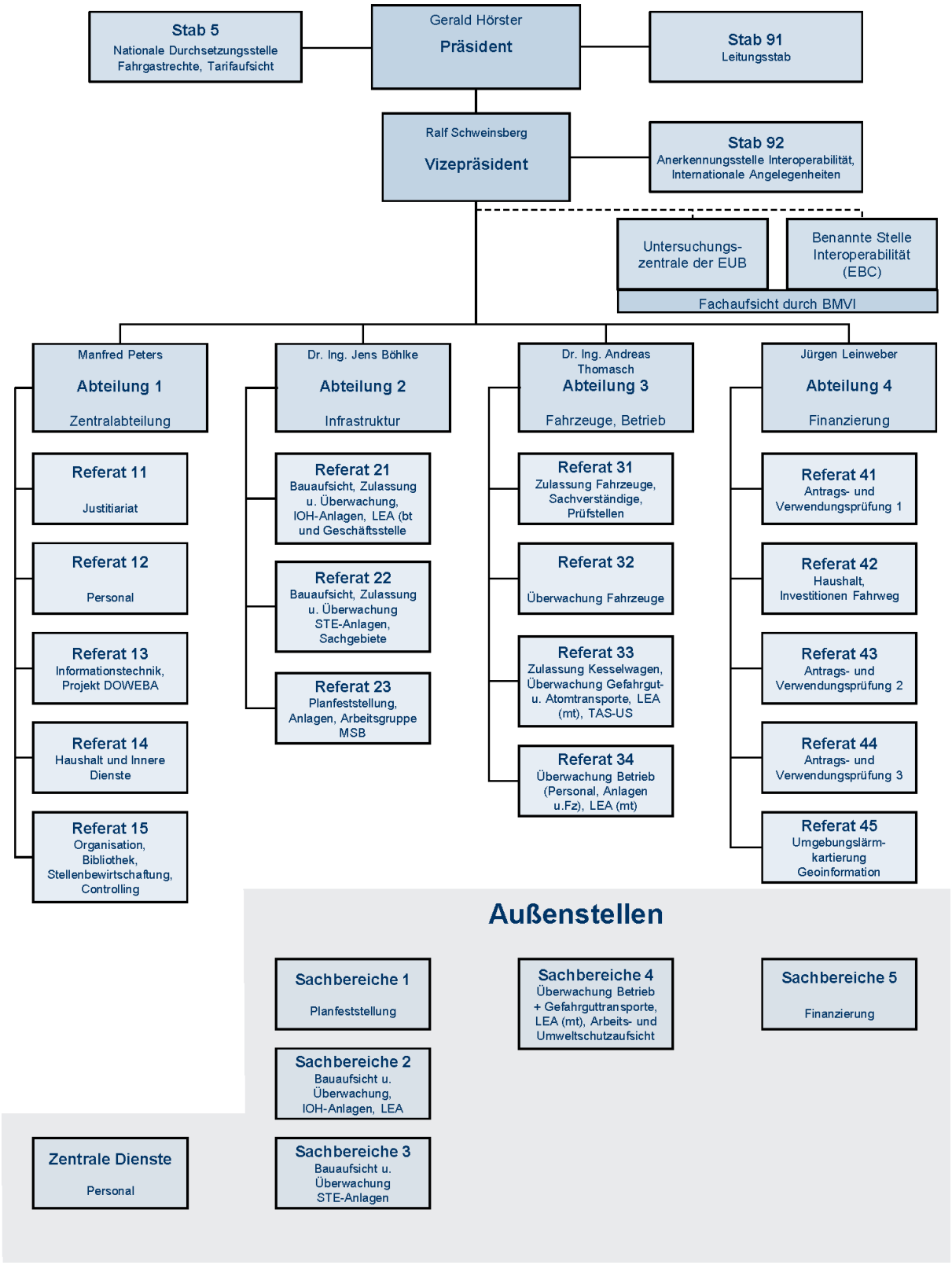
Liste der EVU auf www.eisenbahn-bundesamt.de

A.2.2. A.2.1. List of public EVUs in Germany

Liste der EIU auf www.eisenbahn-bundesamt.de

ANNEX B: Organisation chart

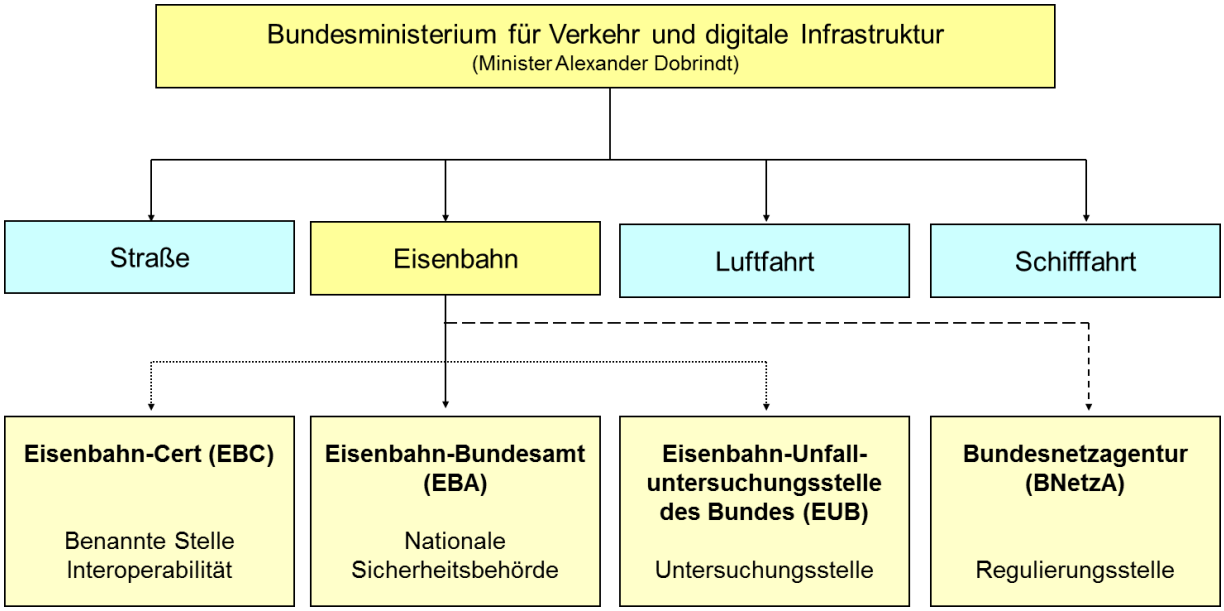
B.1.1. Chart: Internal organisation (as at August 2014)

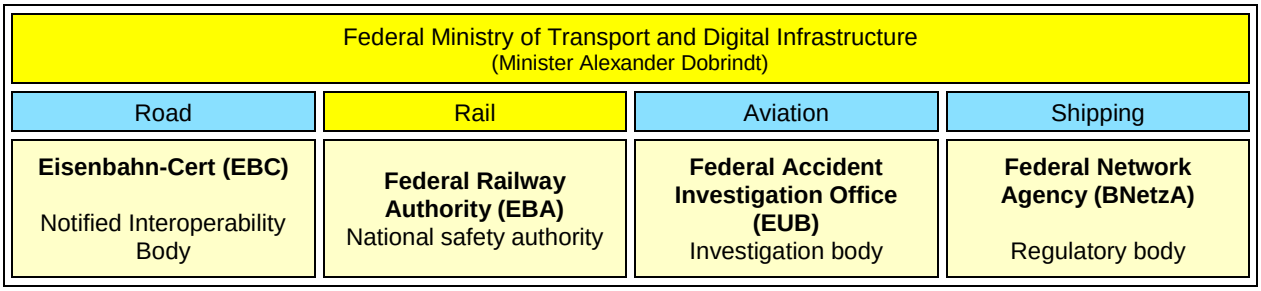


Unit 5 National enforcement body for passenger rights, tariff supervision	Gerald Hörster President		Unit 91 Executive management
	Ralf Schweinsberg Vice-President		Unit 92 Certification Department for Interoperability, International Affairs
		EUB Investigation Centre	Notified Interoperability Body (ECB)
		Specialist inspection by BMVI	
Manfred Peters Department 1 Central Department	Dr. Ing. Jens Bölke Department 2 Infrastructure	Dr. Ing. Andreas Thomasch Department 3 Rolling stock, operations	Jürgen Leinweber Department 4 Finance
Unit 11 Legal	Unit 21 Building inspection, approval and monitoring, permanent way and structural installations, Federal State railway supervision (bt) and office	Unit 31 Approval of rolling stock, experts, testing facilities	Unit 41 Application for and appropriation of funds 1
Unit 12 Staff	Unit 22 Building inspection, approval and monitoring of STE installations, specialist areas	Unit 32 Monitoring of rolling stock	Unit 42 Budget, investment in infrastructure
Unit 13 IT, DOWEBA project	Unit 23 Planning, installations, MSB working group	Unit 33 Approval of tank wagons, monitoring transportation of dangerous goods and nuclear material, Federal State railway supervision (mt), TAS-US	Unit 43 Application for and appropriation of funds 2
Unit 14 Budget and Internal Services		Unit 34 Monitoring of operations (staff, equipment and vehicles), Federal State railway supervision (mt)	Unit 44 Application for and appropriation of funds 3
Unit 15 Organisation, library, position management, controlling			Unit 45 Environmental noise mapping, geoinformation
	Outstations		
	Section 1 Planning	Section 4 Monitoring of operations + transportation of dangerous goods, Federal State railway supervision (mt), supervision of employment and environmental protection	Section 5 Finance
	Section 2 Building inspection and monitoring, permanent way and structural installations, Federal State railway supervision		
Central Services Staff	Section 3 Building inspection and monitoring STE installations		

B.1.2. Internal organisation – Locations of EBA offices

B.2. Chart: Relationship with other national authorities as at 12/2013





ANNEX C: CSI data and applicable definitions

C.1. CSI Data

Safety indicators according to Annex I of the Railway Safety Directive (Directive 2004/49/EC)

1. Indicators relating to accidents

1.1. 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 including collisions with obstacles within the clearance gauge	Derailments of trains	Level crossing accidents including accidents involving pedestrians at level crossings	Accidents leading to personal injury caused by moving railway vehicles, excluding suicides	Vehicle fires	Other accidents
Total	301	29	16	59	161	1	35
Average number	0.291	0.028	0.015	0.057	0.156	0.001	0.034

1.2. Total number and average number (per million train kilometres) of serious injuries and fatalities by type of accident, broken down into the following categories

1.2.1. Person seriously injured

	All types of accident	Collisions of trains including collisions with obstacles within the clearance gauge	Derailments of trains	Level crossing accidents including accidents involving pedestrians at level crossings	Accidents leading to personal injury caused by moving railway vehicles, excluding suicides	Vehicle fires	Other accidents
Total seriously injured	107	2	0	39	61	0	5
Average number seriously injured	0.103	0.002	0.000	0.038	0.059	0.000	0.005
Of whom:							
Passengers	6	0	0	2	4	0	0
Average number of seriously injured passengers	0.006	0.000	0.000	0.002	0.004	0.000	0.000
Average number of seriously injured passengers per billion passenger kilometres	0.068	0.000	0.000	0.023	0.045	0.000	0.000
Average number of seriously injured passengers per million passenger train kilometres	0.008	0.000	0.000	0.003	0.005	0.000	0.000
Employees, including the staff of contractors	18	2	0	2	10	0	4
Average number of seriously injured employees, including contractors	0.017	0.002	0.000	0.002	0.010	0.000	0.004
Level crossing users	35	0	0	35	0	0	0
Average number of seriously injured level crossing users	0.034	0.000	0.000	0.034	0.000	0.000	0.000
Unauthorised persons on railway premises	27	0	0	0	26	0	1
Average number of seriously injured unauthorised persons on railway premises	0.026	0.000	0.000	0.000	0.025	0.000	0.001
Others	21	0	0	0	21	0	0
Average number of others seriously injured	0.020	0.000	0.000	0.000	0.020	0.000	0.000

1.2.2. Person killed

	All types of accident	Collisions of trains including collisions with obstacles within the clearance gauge	Derailments of trains	Level crossing accidents including accidents involving pedestrians at level crossings	Accidents leading to personal injury caused by moving railway vehicles, excluding suicides	Vehicle fires	Other accidents
Total number of fatalities	137	1	0	32	104	0	0
Average number of fatalities	0.132	0.001	0.000	0.031	0.101	0.000	0.000
Of whom:							
Passengers	0	0	0	0	0	0	0
Average number of passengers killed	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Average number of passengers killed per billion passenger kilometres	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Average number of passengers killed per million passenger train kilometres	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Employees, including the staff of contractors	8	1	0	0	7	0	0
Average number of employees, including the staff of contractors killed	0.008	0.001	0.000	0.000	0.007	0.000	0.000
Level crossing users	32	0	0	32	0	0	0
Average number of level crossing users killed	0.031	0.000	0.000	0.031	0.000	0.000	0.000
Unauthorised persons on railway premises	91	0	0	0	91	0	0
Average number of unauthorised persons on railway premises killed	0.088	0.000	0.000	0.000	0.088	0.000	0.000
Others	6	0	0	0	6	0	0
Average number of others killed	0.006	0.000	0.000	0.000	0.006	0.000	0.000

2. Indicators relating to dangerous goods

Total and average numbers (per million train kilometres) of accidents in connection with the carriage 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	4	4
Average number	0.004	0.004

3. Indicators relating to suicides

Total and average numbers (per million train kilometres) of suicides

	Suicides
Total	834
Average number	0.806

4. 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 (EIUs only)	Buckled rails (EIUs only)	Signalling errors (EIUs only)	Signals passed at danger	Broken wheels	Broken axles
Total	858	453	37	0	368	0	0
Average number	0.830	0.438	0.036	0.000	0.356	0.000	0.000
				Resulting in an accident		0	0
				Found in service		0	0
				Found during regular maintenance		0	0

5. Indicators relating to the consequences of significant accidents

Total amount in Euro and average values (per million train kilometres) for

	Number of deaths and serious injuries multiplied by the value of avoiding accident victims	Costs of damage to rolling stock and infrastructure	Costs of environmental damage*	Costs of delays caused by accidents
Total costs	330,984,066	47,569,571	58,500	34,642,321
Average costs	320,052	45,998	57	33,498

6. Indicators relating to technical safety of infrastructure and its implementation

6.1 Automatic train protection

Percentage of tracks with automatic train protection (EIUs only)	96.5%
Percentage of train kilometres run using operational train protection systems	99.0%

6.2 Number of level crossings (in total, per line kilometre and per track kilometre), broken down into the following eight types: **

	With user-side automatic warning	With user-side automatic protection	With user-side automatic protection and automatic warning	With user-side automatic protection and automatic warning and with rail-side protection	With user-side manual warning	With user-side manual protection	With user-side manual protection and manual warning
Actively protected level crossings	799	193	6,714	1,002	111	159	942
Average number per line kilometre	0.024	0.006	0.201	0.030	0.003	0.005	0.028
Average number per track kilometre	0.013	0.003	0.109	0.016	0.002	0.003	0.015

	Total
Passively protected level crossings	4,176
Average number per line kilometre	0.125
Average number per track kilometre	0.068

7. Indicators relating to the safety management system

Total number of internal checks (audits) carried out	Not available
Percentage of internal checks (audits) carried out in relation to the number of checks stipulated or planned	Not available

* Some of the costs of environmental damage are also included in the costs of damage to property shown.
** In some cases, the number of level crossings according to the new categories introduced in 2010 could only be approximated.

C.2. Definitions used in the annual report

C.2.1. Definitions applicable in accordance with Regulation (EC) No 91/2003:

Person killed
means any person killed immediately or dying within 30 days as a result of an accident, excluding suicides.

Person seriously injured
means any person injured who was hospitalised for more than 24 hours as a result of an accident, excluding attempted suicides.

Passenger-km
means the unit of measurement representing the transport of one passenger by rail over a distance of one kilometre. Only the distance on the national territory of the reporting country shall be taken into account.

Rail passenger
means any person, excluding members of the train crew, who makes a trip by rail. For accident statistics, passengers trying to embark/disembark onto/ from a moving train are included.

Suicide
means an act deliberately intended to injure oneself resulting in death, as recorded and classified by the competent national authority.

Significant accident
means any accident involving at least one moving rail vehicle resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded.

Train
means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is not considered to be a train.

Train-km
means the unit of measurement representing the movement of a train over one kilometre. The distance used is the distance actually run, if available, otherwise the standard network distance between the origin and destination shall be used. Only the distance on the national territory of the reporting country shall be taken into account.

C.2.2 National definitions

In addition to the definitions in Regulation (EC) No 91/2003, the definitions of Annex 1 of Directive 2004/49/EC as amended by Directive 2009/149/EC amending Directive 2004/49/EC of the European Parliament and of the Council as regards common safety indicators and common methods to calculate accident costs were used for accident-related CSIs and CSIs relating to incidents and near misses. These definitions were published in the EBA's guidance note on the drafting of safety reports. The guidance note is also available online:
Guidance note on the drafting of safety reports [Leitfaden Sicherheitsbericht] at www.eisenbahn-bundesamt.de

If an accident leads to other types of accident (for example, a derailment leads to a fire), the accident is categorised as the type of accident that triggered the chain. This applies regardless of the severity of the consequences of the accident.

The definition used for a train is different from the definitions given in Annex C.2.1 from Regulation (EC) No 91/2003 in that account is only taken of locomotives travelling on their own (according to the definition in Directive 2004/49/EC):

Train
means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is likewise considered to be a train.

C.3. Abbreviations

CSI	Gemeinsamer Sicherheitsindikator (Common Safety Indicator)
ERA	Europäische Eisenbahnagentur (European Railway Agency)
BÜ	Bahnübergang (level crossing)
M	10^6
Bn	10^9

ANNEX D: Important changes in legislation and regulation

	Legislation	Date legislation came into force	Reason for introduction (details of the new law or amendment to existing legislation)	Description
General national railway safety legislation				
Legislation concerning the national safety authority	Eighth Regulation Amending the Statutory Provisions Governing Railways of 22 November 2013 (BGBl. I p. 4008)	29.11.2013	Further implementation of Directives 2007/59/EC and 2008/57/EC	Supplementing of the Traction Vehicle Driver's Licence Regulation with rules on handling personal data. Inclusion of the official fees belonging to the vehicle type licence introduced in the TEIV into the Federal Railway Fees Regulation (BEGebV).
Legislation concerning notified bodies, assessors, third party bodies for registration, examination, etc.				
National rules concerning railway safety				
Rules concerning national safety targets and methods				
Rules concerning requirements for safety management systems and safety certification of railway undertakings				
Rules concerning requirements for safety management systems and safety authorisation of infrastructure managers				
Rules concerning requirements for wagon keepers				
Rules concerning requirements for maintenance workshops				
Rules concerning requirements for the authorisation of placing in service and maintenance of new and substantially altered rolling stock, including rules for exchange of rolling stock between railway undertakings, registration systems and requirements on testing procedures	Eighth Regulation Amending the Statutory Provisions Governing Railways of 22 November 2013 (BGBl. I p. 4008)	29.11.2013	Further implementation of Directive 2008/57/EC	Amendment of the Trans-European Railway Interoperability Regulation TEIV: Inclusion of rules on licensing of vehicle types, specification of scope.

Common operating rules for the railway network, including rules relating to signalling and traffic procedures				
Rules laying down requirements for additional internal operating rules that must be established by the infrastructure managers and railway undertakings				
Rules concerning requirements for staff executing safety critical tasks, including selection criteria, medical fitness and vocational training and certification	Eighth Regulation Amending the Statutory Provisions Governing Railways of 22 November 2013 (BGBl. I p. 4008)	29.11.2013	Further implementation of Directive 2007/59/EC	Entry into force of the Regulation over Theoretical Checking of the Obtaining of a Traction Vehicle Driver's Licence (TfPV). Supplementing of the Traction Vehicle Driver's Licence Regulation with rules on handling personal data. Amendment of the Trans-European Railway
Rules concerning the investigation of accidents and incidents including recommendations				
Rules concerning requirements for national safety indicators including how to collect and analyse the indicators				
Rules concerning requirements for authorisation for placing infrastructure in service (tracks, bridges, tunnels, energy, ATC, radio, signalling, interlocking, level crossings, platforms, etc.)				

ANNEX E: The development of safety certification and authorisation – numerical data

E.1 Safety certificates in accordance with Directive 2004/49/EC

	Total number of Part A Certificates	Number of Part A Certificates in ERADIS
E.1.1. Number of Part A Safety Certificates issued in the reporting year and previous years that remain valid at the end of 2013	25	25

		Total number of Part B Certificates	Number of Part B Certificates in ERADIS
E.1.2. Number of Part B Safety Certificates issued in Germany in the reporting year and previous years that remain valid at the end of 2013	Number of Part B Certificates for which Part A has been issued in Germany	25	25
	Number of Part B Certificates for which Part A has been issued in another Member State	14	14

		A	R	P
E.1.3. Number of new applications for **Part A** Safety Certificates submitted by railway undertakings in 2013	New certificates	2	0	3
	Updated/amended certificates	0	0	0
	Renewed certificates	0	0	0

			A	R	P
E.1.4. Number of new applications for **Part B** Safety	Where Part A has been issued in Germany	New certificates	2	0	3
		Updated/amended certificates	0	0	0

Certificates submitted by railway undertakings in 2013		Renewed certificates	0	0	0
	Where Part A has been issued in another Member State	New certificates	1	0	3
		Updated/amended certificates	0	0	0
		Renewed certificates	1	0	0

A = *accepted*: application accepted, certificate has already been issued
R = *rejected*: application rejected, no certificate has been issued
P = *pending*: case is still pending, no certificate has been issued so far

	Total number of revoked certificates in 2013	Number of certificates revoked in 2013 in ERADIS
E.1.5. Number of Part A Certificates revoked in the current reporting year	0	0
E.1.6. Number of Part B Certificates revoked in the current reporting year	0	0

E.1.7. List of states from which EVUs applying for a Part B Safety Certificate in Germany have already obtained their Part A Safety Certificate.

Name of the railway undertaking	Member State in which the Part A Safety Certificate was issued
Crossrail Benelux N.V.	Belgium
Railtraxx (BVBA)	Belgium
SNCB Logistics N.A.	Belgium
Railion Scandinavia A/S	Denmark
ERS Railways	Netherlands
Kombi Rail Europe BV	Netherlands
Rotterdam Rail Feeding BV	Netherlands
RTS Rail Transport Service GmbH	Austria
Salzburg AG / Salzburg Lokalbahn	Austria
Wiener Lokalbahnen Cargo GmbH	Austria
Rail Cargo Austria AG	Austria
ÖBB Personenverkehr AG	Austria
PKP Cargo S.A.	Poland
Hector Rail AB	Sweden

E.2. Safety authorisations in accordance with Directive 2004/49/EC

	New	Updated/ amended	Renewed
E.2.1. Number of valid safety authorisations issued to infrastructure managers in the reporting year that remain valid at the end of 2013	0	3	0

		A	R	P
E.2.2. Number of applications for safety authorisations submitted by infrastructure managers in 2013	New authorisations	0	0	0
	Updated/amended authorisations	0	0	0
	Renewed authorisations	0	0	0

A = *accepted*: application accepted, authorisation has already been issued
R = *rejected*: application rejected, no authorisation has been issued
P = *pending*: case is still pending, no authorisation has been issued so far

E.2.3. Number of safety authorisations revoked in the current reporting year	0

E.3. Procedural aspects – Safety Certificates (Part A)

	New	Updated/amended	Renewed
The average time between receiving an application with the information required and the final delivery of a **Part A** Safety Certificate in 2013 for railway undertakings	18 months*	/	/

* These figures include the total time from receipt of the application to the issuing of the certificate, including waiting time for the delivery of documents and certificates. This should not be seen as just processing time. After all documents have been submitted, a decision is made within the statutory period of four months.

E.4. Procedural aspects – Safety Certificates (Part B)

		New	Updated/amended	Renewed
The average time between receiving an application with the information required and the final delivery of a **Part B** Safety Certificate in 2013 for railway undertakings	Where Part A has been issued in your Member State	18 months*	/	/
	Where Part A has been issued in another Member State	10 months*	/	/

* These figures include the total time from receipt of the application to the issuing of the certificate, including waiting time for the delivery of documents and certificates. This should not be seen as just processing time. After all documents have been submitted, a decision is made within the statutory period of four months. For German undertakings, the processing of the applications for Part A and Part B is done together and so the times given in E.3 and E.4 are identical.

E.5. Procedural aspects – Safety Authorisations

	New	Updated/amended	Renewed
The average time between receiving an application with the information required and the final delivery of a safety authorisation in year 2013 for infrastructure managers.	Approx. 2.5 years*	/	/
	/	/	/

* Time period for the actual processing of the authorisation: time from the first deposit of documents for assessment /first statement of the legal position until the formal issue or decision (for example, refusal) on the issue of the safety authorisation by means of a formal decision or administrative letter. The timespan of an average of about two years shown here refers to the three cases described in E.2.3 above.

ANNEX F: List of abbreviations

AEG	General Railways Act [Allgemeines Eisenbahngesetz]
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)]
BEVVG	Federal Rail Traffic Management Act [Gesetz über die Eisenbahnverkehrsverwaltung des Bundes] (Bundeseisenbahnverkehrsverwaltungsgesetz)
BGBl	Official Journal reference [Bundesgesetzblatt]
BMVI	Federal Ministry of Transport and Digital Infrastructure [Bundesministerium für Verkehr und digitale Infrastruktur]
BNetzA	Federal Network Agency [Bundesnetzagentur]
BÜ	Bahnübergang [level crossing]
COTIF	Convention concerning International Carriage by Rail [Convention relative aux transports internationaux Ferroviaires]
CSI	Common Safety Indicator
CSM	Common Safety Method
EBA	Federal Railway Authority [Eisenbahn-Bundesamt]
EBC	Eisenbahn-Cert [notified body for interoperability for the trans-European conventional and high-speed rail systems]
EBO	Railway Construction and Operation Order [Eisenbahn-Bau- und Betriebsordnung]
ECM	Entity in charge of maintenance
ESBO	Railway Construction and Operation Order for Narrow Gauge Railways [Eisenbahn-Bau- und Betriebsordnung für Schmalspurbahnen]
EIU	Railway infrastructure manager [Eisenbahninfrastrukturunternehmen]
ERA	European Railway Agency
ESiV	Railway Safety Regulation [Verordnung über die Sicherheit des Eisenbahnwesens (Eisenbahn-Sicherheitsverordnung)]
EUB	Federal Railway Accident Investigation Office [Eisenbahn-Unfalluntersuchungsstelle des Bundes]
EVU	Railway undertaking [Eisenbahnverkehrsunternehmen]
GGBefG	Transport of Dangerous Goods Act [Gesetz über die Beförderung gefährlicher Güter]
GGVSEB	Order on the Transportation of Dangerous Goods by Road, Rail and Inland Shipping [Gefahrgutverordnung Straße, Eisenbahn und Binnenschifffahrt]
GSM-R	Global System for Mobile Communications – Rail
HOA	Hot box detector [Heißläuferortungsanlage]
Hz	Hertz
IOH	Permanent way and structural equipment [Ingenieur-, Ober- und Hochbau]
kV	Kilovolt
LST	Control and Safety Equipment [Leit- und Sicherungstechnik]
ObÜ	Monitoring of installations [Objektbezogene Überwachung]
RID	Regulation concerning the International Carriage of Dangerous Goods by Rail [Règlement concernant le transport international ferroviaire de marchandises Dangereuses, Appendix C to COTIF]
SMS	Safety management system
STE	Signalling, telecommunication and electrical equipment [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

UbÜ	Monitoring of undertakings [Unternehmensbezogene Überwachung]
VO	Regulation [Verordnung]
VV EA	Administrative Regulation on the Supervision of Railway Structures [Verwaltungsvorschrift zur Eisenbahnaufsicht über bauliche Anlagen]
VV EA-STE	Administrative Regulation on the Supervision of Signalling, Telecommunication and Electrical Installations [Verwaltungsvorschrift für die Eisenbahnaufsicht über Signal-, Telekommunikations- und Elektrotechnische Anlagen]
VV IBG	Administrative Regulation on Authorisation for Placing Rolling Stock into Service [Verwaltungsvorschrift über die Inbetriebnahmegenehmigung von Eisenbahnfahrzeugen]