Eisenbahn-Bundesamt

Report of the
Federal Railway Authority

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

Report Year 2010

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A.1. Scope of the report

The *Eisenbahn-Bundesamt* ERA [Federal Railway Authority] is the safety authority for railways in Germany and, as such, is responsible for carrying out all the tasks assigned to it by the *Fünftes Gesetz zur Änderung eisenbahnrechtlicher Vorschriften* [5th Law Amending Railway Legal Regulations] of 16 April 2007, by which the Directive on safety on the Community's railways (2004/49/EC, 'Safety Directive') was transposed into national law. Corresponding to the tasks listed in Article 16 of the Safety Directive these are in detail:

- Issuing licences for structural subsystems (authorising their putting into service) in accordance with the interoperability guidelines for the trans-European high-speed rail system (pursuant to Directive 96/48/EC) and the trans-European conventional rail system (pursuant to Directive 2001/16/EC),

- Monitoring that the basic requirements for operation and maintenance of the subsystems of the railway system are observed as well as the interoperability components,

- Issuing commissioning licences for vehicles that have not yet been the subject of a Technical Specification for Interoperability (TSI),

- Issuing safety certificates for railway undertakings and safety authorisations for rail infrastructure undertakings,

- Looking at and refining rail safety law, with respect to safety, including the national safety provisions,

- Registering vehicles in the National Vehicle Register.

In addition the EBA performs other tasks, such as for example, the planning for operating equipment for the State railways, helping to finance construction work by the Federal Railway Development Act (BSWAG), work in the area of dangerous goods, activities such as the implementation of Regulation (EC) No 1371/2007 on the rights and obligations of railway passengers or the planning, approving and monitoring of magnetic levitation railways.

In accordance with Article 18 of the Safety Directive this report is restricted to the activities as safety authority, in particular the development:
- of railway safety including the common safety indicators (CSI),
- of the legal framework in the area of railway safety,
- of the safety certification and authorisation as well as
- of the knowledge obtained from the supervision of the railway undertakings.

The layout the report follows a recommendation of the European Railway Agency (ERA).

A.2. Summary in English

The overall purpose of this report is to convey information on the performance of Eisenbahn-Bundesamt (EBA) [Federal Railway Authority] acting as National Safety Authority pursuant to Directive 2004/49/EC on safety on the Community's railways. This report is aimed at stakeholders in the German and European railway market and the interested public.

EBA was founded in 1994 in the context of German railway reform as one element of this reform. When transforming former state-railways Deutsche Bundesbahn and Deutsche Reichsbahn into the private undertaking Deutsche Bahn AG, sovereign tasks like, for example, type approval of vehicles and tracks or public financing of investments were allocated to EBA. Since 1994, EBA has acted as an independent authority inside the sphere of the German Federal Ministry of Transport, Building and Urban Affairs. Its headquarters is located in Bonn, while most of the approximately 1 250 employees work in twelve branch offices at fifteen locations throughout Germany.

In view of EBA's experience since 1994, it was a logical step to officially allocate the tasks of a National Safety Authority according to Article 16 of the Safety Directive to EBA as well. This step was taken in April 2007 when the '*Fünftes Gesetz zur Änderung eisenbahnrechtlicher Vorschriften*' [Fifth law amending railway legal regulations] came into force and completed the implementation of the provisions of the Safety Directive into German law.

Parts A, B and C of this report and the related annexes contain global information on the railway system in Germany as well as details concerning the legal background, tasks and organisation of EBA. Parts D to H focus on safety related issues:

- Chapter D lists important safety measures taken in 2010, separated into measures resulting from events like accidents, from safety recommendations or from other triggers like findings during supervision activities. Furthermore, it contains a trend analysis of Common Safety Indicators (CSIs). Annex C shows a table of CSI for 2010.

- Chapter F deals with safety certification and authorisation; Annex E contains figures related to this topic.

- Chapter G outlines how supervision of Railway Undertakings and Infrastructure Managers was performed by EBA in 2010.

- In Chapter H, the application of the CSM to risk evaluation and assessment is prescribed. The application is mandatory for significant changes to certain parts of the railway system from July 2010 on; it will become applicable to all significant changes by July 2012.

B. Introduction

1. General

This annual report provides information on the activities carried out by the EBA as the German safety authority for railways pursuant to the Safety Directive. It is primarily aimed at the railway sector in Germany and Europe, but also at representatives from other areas of politics, business and the press and interested members of the general public.

EBA was set up as an independent, unitary higher Federal authority within the ambit of the Federal Ministry of Transport, Building and Urban Development (BMVBS) when the railway system in Germany was restructured in 1994. It is the inspection and licensing authority for the *Eisenbahnen des Bundes* (EdB) [State railways] magnetic levitational railways and rail transport undertakings (RUs) based abroad for the territory of the Federal Republic of Germany. The EBA is now also responsible for inspecting non-federally owned railways that require a safety certificate or safety authorisation as well as network-based inspection in accordance with Section 5(1c) of the General Railway Act (AEG).

2. Railway structure information

On 31 December 2010, the public rail network in Germany consisted of approximately 38 000 km of track. of which about 20 000 km were connected to Germany's standard electrified system (15 kV, 16 2/3 Hz). This network of track is operated by a total of around 175 licensed public rail infrastructure undertakings. Around 32 500 km of track are operated by DB Netz AG, the largest infrastructure operator in Germany.

Over 400 public railway undertakings were licensed under Article 6 of the General Railway Act (AEG) to provide rail transport services on Germany's public rail network at the end of 2010. This corresponded to a licence pursuant to Directive 95/18/EC (2001/13/EC) on the granting of licences to railway undertakings. Foreign railway undertakings also operate in Germany on the basis of a licence acquired in another Member State of the European Union in accordance with Directive 95/18/EC (2001/13/EC).

In 2010 the decline in freight traffic on the German network noted in the previous year due to the economic downturn has been largely reversed. In the course of this the railway has won a bigger share of the total market. In the modal split of land traffic carriers (road, railway and inland waterways) the share of the railway within the year rose from 16.6% to 17.8% which was exactly the same figure as in 2008.[1] The number of passengers carried also rose slightly.

In 2010, the public railways carried 355.7 million tonnes of freight (+14.0% compared to the previous year). The transport performance rose rather less by 12.0% to 107.3

[1] Source: Bundesamt für Güterverkehr, Marktbeobachtung Güterverkehr – *[Federal Office for Freight Traffic, Market Research in Freight Traffic]* Annual Report 2010

billion tonne kilometres.[2] The continuing good order situation suggests that 2011 will produce favourable figures for the transport volume.[3]

Railway passenger traffic also rose slightly in comparison with the previous year. The number of passengers carried rose 2.0% within the year to 2.37 billion passengers, the transport performance also increased from 81.2 to 83.0 billion passenger kilometres (+ 2.2%).[4]

3. General trend analysis

In 2010 there was a total of 298 significant railway accidents on the railway network in Germany covered by the Safety Directive . Thus the number of significant accidents has fallen compared with the previous year by 4.0% (2009: 319 significant accidents). Based on the respective accident categories there was an increase in derailments, accidents on level crossings as well as 'other accidents'. On the other hand there was a decrease in events in the areas of collisions as well as especially the 'Accidents with personal injury which were caused by railway vehicles in motion' which in total led to a fall in the number of significant accidents.

Annexes

A map of the railway network in Germany is attached to this report as an Annex (**Annex A.1**). Likewise on the left are lists of the licensed railway undertakings and railway infrastructure managers (**Annex A.2**).

[2] Source: Statistisches Bundesamt, Technical series 8, Number 1.1, 07/2011
[3] Source: Bundesamt für Güterverkehr, Marktbeobachtung Güterverkehr – *[Federal Office for Freight Traffic, Market Research in Freight Traffic]* Annual Report 2010
[4] Source: Statistisches Bundesamt, Technical series 8, Number 1.1, 07/2011

C. Organisation

The EBA is, as already explained in the introduction, pursuant to Section 2(1) of the *Bundeseisenbahnverkehrsverwaltungsgesetz* (BEVVG) [State Rail Transport Management Act] an independent, unitary Federal authority within the ambit of the Federal Ministry of Transport, Building and Urban Development BMVBS.

The specific tasks of the EBA are laid down in detail in Section 3 BEVVG. Accordingly, the EBA is responsible for the following tasks:

1. Planning for operational equipment for the State railways,
2. Inspecting the railways,
3. Inspecting construction of operational equipment for the State railways,
4. Issuing and revoking operational licences,
5. Exercising its own authority as well as inspection and participation rights pursuant to other laws and regulations,
6. Preparing and carrying out agreements pursuant to Section 9 of the *Bundesschienenwegausbaugesetz* (BSchwAG) [Federal Railway Development Act],
7. Granting State funds to promote rail transport and to promote the combination of rail transport with other means of transport.

For the purposes of carrying out its tasks the EBA has a Head Office in Bonn and 12 branch offices in 15 locations throughout Germany. The EBA's Head Office has four departments (Head Office Services, Infrastructure, Vehicles/Operation and Finance Departments), There are 18 subordinate units. The local tasks are carried out by five expert areas in the 12 outside offices. They are coordinated by the respective technical units in the Head Office. An organisational chart of the EBA as well as an overview of the locations of the branch offices is given in **Annex B**.

The EBA is set up as a higher Federal authority within the purview of the Federal Ministry for Transport, Building and Urban Development and is therefore answerable to that ministry. Alongside the EBA, three other bodies have responsibilities in the railway sector in Germany:

The **Federal Railway Accident Investigation Office (EUB)** which is the Investigation office as specified in Safety Directive 2004/49/EC, manages and is responsible for the investigation of accidents in pursuant to Chapter V of the Safety Directive for Infrastructures for which the State is responsible**.** Managing the EUB is the responsibility of the BMVBS, while operative tasks are carried out by an investigation centre technically answerable to the BMVBS within the EBA.

The **Federal Network Agency** (Bundesnetzagentur, BNetzA), which is a regulatory body pursuant to Directive 2001/14/EC, 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 Technology. However, specialist monitoring in the rail regulation sector is the responsibility of the Federal Ministry for Transport, Building and Urban Development (BMVBS).

Eisenbahn-Cert (EBC), which is the Notified Interoperability Body for the trans-European conventional and high-speed rail systems pursuant to Directives 96/48/EC and 2001/16/EC, checks and certifies compliance with the European rules for interoperability components and subsystems of the rail system.

A schematic representation of the situation on 31 December 2010 is attached to this annual report in **Annex B.2**. An overview of the cooperation between Notified Bodies and the EBA for issuing commissioning licences for structural subsystems is given in **Annex B.3**.

D.The development of rail safety

Initiatives to maintain/improve safety

This section contains a list of the measures decided on and taken by the EBA or transposed in Germany in 2010 to maintain or improve safety on the railways. EBA measures based on specific events such as accidents are shown in Table D.1.1. while EBA 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/precursors to accidents

Accidents/precursors which triggered the measure			Safety measure decided on
Date	**Place**	**Description of the event**	
Modernisation of level crossings with keepers			
2006 / 2010 2008	Hergensweiler Cadenberge	Fatal accident or dangerous events due to barriers on the level crossing not being closed.	Replacement by rail or road bridge or technical modernisation of level crossings with keepers.
Wheelset Axles of class 411 / 415 (ICE-T)			
Various	Various	Cracks were detected on several wheelset axles of ICE-T vehicles in connection with implausible calculations to establish the inspection interval.	The interval for crack detection was reduced and vehicles forbidden to run on curves with the tilt mechanism activated.
Wheel disc deformation on Class 146			
Various	Various	On class BR 146 vehicles there were several cases of wheel disc deformation.	The cause of the deformation was thought to be torsional loading of the wheelset resulting from the so-called 'burnishing action' or flanging process. Manufacturers and operators are working on a solution to reduce this rolling process technically to acceptable dimensions and in addition to quantify the damage of the wheelsets experienced in the past by drumming vibrations. The locomotives that are in service are examined at frequent intervals for wheel disc deformation.

Stop ridges on Type Lg(n)s 580 container wagons			
11/08/2010	Maschen marshalling yard (Rbf)	After the derailment of such a wagon, an abnormality on a stop ridge between the spring shackle and wheel disc was detected. The stop ridge was a later modification to the wagon type.	After appropriate testing it was found that the stop ridge did not fulfil the intended function but on the contrary under certain conditions it could damage the spring shackle. The ridges will be removed during special inspections by the end of 2011. Until then vehicles fitted with this feature will be specially checked during wagon inspections for abnormalities. Defects found will be reported to the EBA.

Table D.1.2. Safety measures with other triggers

Description of the triggers of the measure	Safety measure decided
Overhead lines and aerial cables	
During a nationwide special investigation by the EBA of overhead lines and aerial cable equipment a lot of defects were found which required immediate attention by the operator. The special inspections carried out by the infrastructure manager concerned confirmed these defects.	The central demand of the EBA to resolve the defects on overhead lines and aerial cables was implemented. In addition the corresponding documentation was suitably amended and extended.
Maintenance squads (Project Information System (PRINS) squads)	
Because of the negative experience of one squad the method of operation and personal equipment of the PRINS squads was checked by sampling.	The report was not confirmed by the nationwide sampling checks of the method of operation of the PRINS squads. The planned inspections were in general carried out at the right time and in accordance with the requirements of Ril 892. The staff were competent and equipped with the necessary tools, measuring equipment and materials. Serious defects were not found and minor problems were immediately resolved.
Remote surveillance of electronic equipment in railway stations	
Frequently a non-functioning or not yet available remote surveillance of electronic equipments in railway stations was the cause for the non-installation of this equipment.	Where no remote surveillance of electrical equipment operated, compensating measures were introduced (for example in the form of on-the-spot checks on foot).
Freight wagons with side buffers	
During checks it was found that, in particular, on vehicles which run in block trains the lubrication of buffers was insufficient,	The RUs involved were requested to introduce processes which ensure sufficient lubrication of buffers in service. The effectiveness of the measures was monitored by recorded checks by the RU as well as by own checks as part of the vehicle monitoring.

Payload residue outside the payload trough	
On vehicles for bulk goods payload residue was frequently found outside the payload trough.	The RUs were encouraged to introduce processes which avoid this problem. In addition all the places involved in the transport chain were advised about this and the effectiveness of the measures checked by minuted special investigations.
Checking wire strainers in mechanical signal boxes	
As a result of a derailment in 2009 which was caused by a pin which fell out of a wire strainer (for details see the annual report for 2009), sample checks were carried out on wire strainers of mechanical signal boxes.	Because of the age of the equipment there is corresponding wear, which until it is replaced requires careful attention by the operator. The specified fixing instructions for loose track rods cannot be carried out. A revised version of the technical instruction is in the process of being agreed between the infrastructure manager concerned and the EBA.
Passenger protection	
During the safety analysis of protection measures on pedestrian level crossings in stations a need for action was identified for certain conditions.	To protect passengers from dangers arising from railway operations, the use of barriers or chains to secure passenger level crossings had been prescribed for certain conditions but, instead, the installation of an optical warning device coupled to an acoustic warning was planned, following an alternative solution suggested by the infrastructure manager involved.
Braking behaviour of freight vehicles	
A report of the Swiss Monitoring Authority drew attention to some points which are not clear in the treatment of freight wagons with two distributors, one valve of which is defective.	RUs and owners were instructed that on wagons which have two distributors, one valve of which is defective at least, the defective valve on this wagon part shall be isolated. Contrary to the information painted on the wagon no braked weight should be calculated for the wagon.

Detailed data trend analysis

Annex 1 of the Safety Directive specifies Common Safety Indicators (CSIs) which the safety authorities should give details of in their annual reports. The various categories of CSIs include:

- Number of accidents;
- Number of fatalities;
- Number of persons injured;
- Number of precursors (forerunners) to accidents;
- Costs of all accidents, time spent on safety and
- Technical safety of the infrastructure and its implementation and safety management.

Since 2007, the data on which the Common Safety Indicators are based is taken from the safety reports made by the railways to the EBA. The data source for 2006 was the database of hazardous incidents reported to the EBA. The threshold for recording accidents is based on Directive 2009/149/EC amending Directive 2004/49/EC of the European Parliament and of the Council in respect of the common safety indicators and common methods for the criteria included in accident cost calculation. Accordingly, only those accidents are included in which at least one moving railway vehicle is involved and in which

- at least one person was killed or seriously injured or
- considerable damage was caused to vehicles, lines, other equipments or the environment (damage of at least EUR 150 000) or
- significant operational incidents (disruption to traffic on a main line for six hours or more).

As a result, the reported accident figures for 2007 et seq have fallen sharply in comparison to those for 2006 and cannot in any way be compared with the 2006 values. This is very clear in the categories of collisions, derailments and vehicle fires. It will therefore only be possible to use the CSIs to analyse trends from 2007. The definition to be used for broken rails also changed in 2007. Since then broken rails which did not pose a concrete danger also need to be listed, which has led to an increase in the number of broken rails in 2007 and thereafter. As far as signals passed at danger are concerned from 2009 for the CSI, in accordance with the definition, only events in connection with train running are considered, thus the number of cases of signals passed at danger has fallen sharply compared with the previous years.

The CSI for accidents, people fatally and seriously injured were agreed with the figures obtained from the State Statistical Office. The values are not identical since the State Statistical Office considers all the public railways in Germany, while in this report the common safety indicators as specified in Directive 2004/49/EC only

include those from undertakings which require a safety certificate or safety authorisation. For this reason the number of accidents from the State Statistical Office is higher than the values of the CSI given in this report.

In 2010 there was a total of 298 significant railway accidents on the railway network in Germany covered by the Safety Directive. Thus the number of significant accidents has fallen again compared with the previous year (2009: 319 significant accidents, -4.0%).

The number of people seriously injured in railway accidents in 2010 was 118, which was about the same number as in 2009. After a reduction of about 25% in the previous year the number has been stabilised at the lower level. Thus, the number of seriously injured passengers in the year fell from 13 in the previous year to eight. There was also a reduction in the number of unauthorised people injured. On the other hand the number of people seriously injured in railway accidents in the category of employees and other people increased slightly. The number of seriously injured level crossings users has also increased. Over half (about 52%) of all seriously injured people are users of railway level crossings or unauthorised people on railway premises.

The number of the people who died in railway accidents reduced significantly from 170 in 2009 to 146 in 2010 (-14.1%). Approximately 85% of the fatalities are in the categories 'Users of railway crossings' and 'Unauthorised persons on railway premises'. Fortunately no passengers were fatally injured. Detailed consideration shows that the decrease in the number of people fatally injured in railway accidents was caused by a considerable decrease in fatalities to unauthorised people on railway premises. Nevertheless this group alone accounts for more than half the people killed.

In 2010, for the first time details of the economic consequences of accidents are included. Consequently in accordance with Directive 2009/149/EC details are given of the damage to property and environmental damage as well as a calculation of the costs due to delays and the costs and business losses of the casualty. The basis of the calculations were the results of the 'HEATCO' Project recommended by the European Railway Agency (EU-commissioned project for working out the basis for the economic assessment of infrastructure projects, more under http://heatco.ier.uni-stuttgart.de)

The data for the individual CSIs for the report year 2010 as well as the definitions used for the determination of the CSIs are given in **Annex C** of this report.

Results of safety recommendations

In 2010 the following safety recommendations were issued by the Investigation Agency:

After the collision of an ICE with associated derailment in Landrücken Tunnel on 26 April 2008 it was recommended that:

1. in order to increase the safety against derailment in high speed traffic, consideration should also be given to whether fencing the line or sections of the line can be still be dispensed with or whether similar events can be prevented in future by other means.
2. the recognisability of escape routes and emergency equipment in coaches should be checked and optimised.
3. Ril 123 regarding Module 123.150 Outside Rescue should be revised, in particular there must be a clear division of responsibility between the Emergency Manager / the Emergency Control Centre / and the Operations Management.
4. the operating instructions should be checked to see what action the operating staff should take when there is a collision with a herd of animals.
5. renewed instruction and regular training should be given to the responsible rescue services regarding the locality and safety equipment as well as the planning and carrying out of tunnel rescue practices.

Recommendations No.1, 3 and 5 are at present being discussed between BMVBS, EBA and the infrastructure manager concerned. The process is not yet concluded. Regarding recommendation No. 2 the vehicle operator was able to demonstrate that the train had suitable equipment and credibly explain that even though that accident had occurred there was no optimisation requirement. When recommendation No.4 was considered no requirement for modification of the relevant operating instructions was identified.

As a result of the train collision on 16 April 2009 in Berlin-Karow station a safety recommendation with the following content was issued:

1. the regulations for cases where signals autonomously drop back to the ‘stop’ position should be formalised for (old) signal boxes without automatic track clear signalling equipment with the object of installing this as soon as possible.
2. the project planning for cases where signals autonomously drop back to the ‘stop’ position should be checked with comparable signal boxes in the existing network.
3. comparable stations should be checked to see whether automatic track clear signalling equipment should be provided.

As a result of this recommendation the infrastructure manager concerned has produced a technical instruction with the title 'Rules for the signal stop position of the exit signal and fitting with track clear signalling equipment'. This contains clear instructions for cases where signals autonomously drop back early to the ‘stop’ position. These should basically be applied to new constructions of and to larger conversions of signalling equipment and track clear equipment. The technical instruction came into force immediately.
The complete network of the infrastructure manager concerned was investigated with the object of identifying comparable cases in the complete system, with similar danger potential. The consideration of the presence of a signal track clear report, of Entry/Exit repetition blocks and the removal of the effect point for cases where signals autonomously drop back to the ‘stop’ position. The infrastructure manager concerned has prepared comprehensive data material and derived corresponding risk analyses form these. Localised problems have subsequently been remedied.

In the report of the investigation of a derailment on 7 August 2009 on the line from Nürnberg-Stein to the Nuremberg marshalling yards (Nürnberg Rbf) it was

recommended that the track documents regarding the inspection of track and switches of the track type K-54-B58 should be revised and extended to:

1. Specify a graded inspection roster for the investigation of the tightness of fastening materials in tracks and switches. In the grading line speed/line loading as well as exposed places in the network (e.g. tight curves, lines with wooden sleepers which have been in position for a long time, track types with 'indirect fastening', with other restrained points) should be considered.
2. Specifying a test method to check the tightness of fixing materials as well as corresponding test values. As a suitable test, for example, the tightness can be measured by means of a torque spanner.

There are currently discussions between the EBA and the infrastructure manager involved on the recommended revision of the documentation. The procedure is not yet concluded.

In addition, in 2010 a safety recommendation was issued by the Austrian Investigation Office after the derailment of a freight train following a brake failure between Hintergasse and Braz. The safety recommendation referred to a design detail of the wagons concerned which was responsible for the brake failure. Similarly equipped vehicles had to be checked by a special examination arranged by the operator and during the normal maintenance of the wagons to see that the design of the suspension of the main brake pipe hose on the short coupling end is correct. As a result of the cooperation with the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT) no further action was necessary.

Postscript to the safety recommendations mentioned in the previous year's report which at present are not yet concluded:

In 2007 a safety recommendation was made by the Investigation Agency which referred to the introduction of hot box detectors (HBD). The EBA has discussed possible improvements based on the necessary distances apart, detection possibilities and basic assumptions for the temperature rise with the infrastructure managers. The draft of a new specification for hot box detectors and *Festbremsortungsanlagen* (FBOA) [dragging brake detection equipment] was prepared by the infrastructure manager concerned and submitted to the EBA in May 2010. In several technical discussions, finally in the first quarter of 2011 further instructions were supplied by the EBA to the DB Netz AG specification writer. A final submission to the EBA and the associated procedure for the granting of an assurance should be completed by the end of the year. The specification contains improved requirements for the detection (trend recognition for temperature developments), methods of assessment (diagnosis) – according to statements by the operator in future a management system is envisaged – and equipment stability. Also by the further development of HBD / FBOA equipment already in service improved requirements (e.g. recognition and exclusion of faulty alarms, improved detection) are currently being tested or are already converted.

A further safety recommendation from 2007 was based on a railway accident on 20 November 2006 due to the insufficient braking power of a suburban train at Berlin-

Südkreuz. The certification of the railway undertaking concerned for the modified brake equipment and brake control is ongoing. In the meantime the service runs with speed restrictions.

A 2008 safety recommendation goes back to the derailment of an ICE 3 in Cologne Main Station due to a driving axle fracture on 9 July 2008 and recommended a check of the initial date of the material used for the wheelset with respect to the fatigue strength certificate. The procedure regarding this event is not yet concluded. The measures introduced after the derailment of recurring non-destructive testing of axles for internal defects continue.

A 2009 safety recommendation was based on an event with strong smoke generation in a double deck driving trailer of a local train where the auxiliary brake had not completely released. The recommended fitting of a warning light in the field of view of the train driver to indicate an applied or not completely released auxiliary brake on the driving trailer has been in existence for some time. The additional recommended check to see whether the suction shaft of the air conditioning equipment could be fitted in another position has not, however, been completed.

The second safety recommendation issued in 2009 was based on the results of the investigation of a derailment of a freight train due to an axle fracture resulting from a hot axlebox. The recommended exchange of riveted brass cages in the axle bearing for plastic bearing cages is at present being assessed. The second aspect, the investigation of derailment detectors or sensors to recognise hot axle bearings is at present being discussed on the European or international level in the corresponding committees of the ERA and the Regulations concerning the International Carriage of Dangerous Goods by Rail (RID, Annex C of COTIF). The procedure is not yet concluded.

E. Important changes to legal and regulatory provisions

During 2010, no changes were made to railway law in Germany that affect railway safety.

The table in **Annex D** is therefore empty (no changes in the period of the report).

F. The development of the safety certification and authorisation

1. National Law - Starting dates - Availability

In 2007, the Safety Directive was transposed into national law by the Fifth Law Amending Railway Regulations and the Second Regulation Amending and Enacting Railway Regulations. The start date for issuing safety certificates and safety authorisations was the date the Fifth Law Amending Railway Regulations came into force, i.e. 21 April 2007. Up to this point, safety certificates had been issued by the Federal Railway Authority pursuant to Directive 2001/14/EC.

As national safety regulations, the provisions are applicable in accordance with the Communication from the Government of the Federal Republic of Germany to the European Commission of 25 January 2008 on relevant national safety provisions for the rail system in Germany pursuant to Article 8(2) of Directive 2004/49/EC. This Communication is available on the EBA homepage. The annexes to the Communication contain the classification of regulations in accordance with Annex II of Directive 2004/49/EC, together with further details as per the form developed by the ERA, including links to the individual regulations. The availability is ensured by public access to national laws and decrees in various media. The documentation of the infrastructure manager for access to the network that forms the national safety regulations is available on its internet portal or can be requested by media logistics as a document. That the access to the regulations in the meantime continues not to be a problem should be seen at various places as being due to the trend of the customer orientated simplification of the data access.

2. Numerical data

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

In 2010 the following applications were received by the EBA:

- 2 applications for the issue of safety authorisations
- 1 application for the issue of a safety certificate Part A
- 2 applications for the issue of a safety certificate Part B

The applications for the issue of a safety authorisation in 2010 were - as were all applications from the previous year – put forward by infrastructure managers who participated on 21 April 2007 in the railway operation. Under Section 38(5)(c) of the

General Railway Act (AEG), the safety authorisations were, therefore, deemed to have been provisionally issued until a final decision was taken on the applications.

3. Procedural aspects

3.1.Safety certificates – Part A

In 2010 no amendments / revisions were made to Safety certificates Part A. The processing of the applications for safety certificates Part A was delayed mainly because of the need to make changes to the certificates to be produced or due to implausibilities which were found during the assessment of the applications. In addition it must be stated that for some applications the separation of the purely organisational based Part A from the certificate management for the Part B did not meet the particular requirements of the respective network from the start.

In the opinion of the national safety authority there are problems because it is difficult to have definitions that are sufficiently harmonised and requirements on the minimum expectations are lacking, as well as a basis for the scope of checking in the assessment of the application.

Formal feedback procedures for rail transport undertakings in connection with the process for issuing safety certificates are not required under either the Safety Directive or national legislation. However, undertakings are free to submit their views on the procedures informally. The following problems were quoted by undertakings:

- Structuring of an SMS that covers the most historically grown authority functions of the undertaking
- Understanding the safety directed objectives of an SMS compared with QMS.
- Responsibility for and control of the risks of providing services or resources by suppliers, service providers and contractual partners

3.2. Safety certificate Part B

In 2010 no amendments / revisions were made to Safety certificates Part B. In addition it must be stated that for some applications the separation of the purely organisational based Part A from the certificate management for the Part B does not meet the particular requirements of the respective network completely from the start.

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. The railway undertakings have, in particular, problems in connection with the requirements for preparation of the maintenance schedule for vehicles in application of DIN 27200 et seq.

3.3. Safety authorisations

The applications received so far are still being processed, since the examination could not yet be completed, in particular, because of missing or incomplete application documents. No definite decisions have yet been taken.

G. Supervision of railway undertakings and infrastructure managers

The following section explains how railway undertakings and infrastructure managers in Germany were inspected by the Federal Railway Authority in 2010. In 2010, there were about 175 staff available to the Federal Railway Authority for carrying out inspections in the areas described below.

Inspection of permanent-way and structural equipment (Unit 21)

Monitoring of infrastructure managers to ensure that equipment meets prescribed standards and complies with rules for the inspection and servicing of equipment is carried out by Unit 21 and Field 2 of the EBA branch offices during inspections of permanent-way and structural equipment. Railway inspections which are done by sampling, enable it to be established whether during the use of the approved equipment the AEG and the associated legal regulations as well as the recognised engineering rules, are complied with. The main purpose of the railway inspection is to check that the railway undertaking is meeting the safety obligations laid down in Section 4(1) of the General Railway Act.

General monitoring during the railway inspection is basically limited to random checks. In this respect, the Federal Railway Authority distinguishes between three kinds of monitoring in accordance with the Administrative Regulation on the Inspection of Structural Equipment of the State railways:
a) Monitoring of undertakings
b) Monitoring of installations
c) Special monitoring
These types of monitoring are supplemented as necessary by special investigations.

The railway administration regulation (VV EA) on building installations is available to view or download under the following link to the EBA internet site:
http://www.eba.bund.de/cln_030/nn_342570/DE/Infothek/Infrastruktur/Allg__Vorschriften/VVEA/VVEA__node.html

On 8 February 2010 the VV EA withdrew the 'Administrative Regulation on railway inspection of structures and mechanical equipment and carrying out the technical inspections of safety in the workplace' (VV TAU) which had applied up to this time. The VV EA which was based on the VV TAU has been extended on the basis of the process orientation in order to take into account the requirements of the Safety Directive (granting of safety certificates / auditing as part of the safety management system, etc.). The process orientation also improves the possibility of a systematic assessment, based on individual types of equipment of the maintenance organisation of the monitored railway undertakings.

The division into three parts described above is an attempt to introduce an assessment of the maintenance activity of the infrastructure operator that is as flexible and reliable as possible. The individual types of inspection are described below:

a) The *unternehmenbezogene Überwachung* (ubÜ) [the inspection of undertakings] is to see to what extent existing - partly inside the undertaking - rules for carrying out of the maintenance in the sense of DIN 30541 (servicing, inspection, maintenance) have been implemented and observed. It consequently assesses the maintenance organisation of the operator by looking at the offices responsible for the equipment and basically carrying out an audit of the maintenance organisation. This type of monitoring is carried out at regular intervals (about every 2 years).
b) The *objektbezogene Überwachung* (obÜ) [physical checks] is done by sampling. It enables an assessment to be made of the equipment condition on site as well as the monitoring of the staff involved in the maintenance. It is carried out by observing the equipment inspections carried out by the operator. It is regularly done for the different types of maintenance work.
c) The EBA reserves the right in cases in which the ubÜ and/or obÜ do not reach a clear assessment of an installation to carry out a special investigation. In addition special investigations can be carried out, in particular, after accidents or exceptional events.

In the investigations carried out in 2010 in the field of permanent way and structural equipment no important deficiencies were found in the maintenance system of the State railways. Orders to the infrastructure managers only had to be made in a small percentage of the investigations for the individual equipment.

In the field of track a special investigation focussed on whether rail faults of the head check type were dealt with as specified in the documentation. It was found that the vast majority of cases of head check damage was found by the infrastructure manager. There were deficiencies in the documentation and in the measures to be taken. Maintenance tended not to be preventative, but to be carried out only in the later stages of the development. The discussion of the results of the special testing is not yet concluded.

Inspection of signalling, telecommunication and electrical equipment (Unit 22)

The EBA has reorganised the process of railway inspection on the basis of knowledge of management practice of the last few years and due to changed European specifications. In this connection it has also taken into account changed staff basic conditions.
In the field of railway inspection of signal, telecommunications and electronic equipment a new management procedure came into force at the beginning of 2010. The new procedure for railway inspection based on a risk and defect orientated approach for the inspection of equipment depending on its safety significance and additionally depending on the frequency of defects in it is contained in 'Management regulations for railway inspection of signal, telecommunications and electrical equipment' (VV EA-STE). This procedure uses a methodically protected statistical

approach. With representative samples a very high 'hit rate' is achieved to assess the quality of maintenance with operators of the equipment so that problems can be recognised at the right time and then followed up. In addition to the systematic sampling test of all equipment, a regional and nationwide programme of undertaking and process based inspections is carried out that is flexible on subjects.

By combining the statistically based core programme and the special theme programmes the danger protection remit of the EBA can be fulfilled with an efficient use of resources. Thus, danger areas can be checked in a targeted way, critical subjects such as the maintenance management system of the railway infrastructure undertakings effectively investigated and defects or difficulties found nationwide cab be quickly dealt with. A national standard management system is guaranteed by specifying test contents and scope of testing in testing guidelines per subject (check lists for each subject). All data from the statistical records is captured and assessed by a newly designed data bank tool. This enables a rapid identification of new critical points.
The VV EA-STE can be seen or downloaded at
http://www.eba.bund.de/cln_031/nn_342570/DE/Infothek/Infrastruktur/Allg__Vorschriften/VVEASte/VVEASte__node.html

Beside the representative samples specified in the safety register, the priorities in the inspections carried out in 2010 were in the following areas:

- Building measures by electronic equipment in railway stations
- Checking the insertion of infrastructure elements in the SAP computer application of DB Netz
- Maintenance of Siemens-motor relays
- Wire strainers in mechanical signal boxes
- Overhead lines and air cable equipment
- Checking maintenance gangs
- GSM-R base stations

The monitoring of State railways carried out in 2010 showed no serious safety faults. Where faults were discovered that had safety implications, instructions were given to restore safety and order in relation to the rail equipment.

Inspection of railway vehicles (Unit 32)

Unit 32 of the Federal Railway Authority is responsible for inspecting railway vehicles. The frequency and scope of the inspections depend on the quality and the extent of the observation of all technical and legal obligations by the railway undertakings. In order to determine the extent to which railway undertakings meet their legal obligations under Section 4(1) of the General Railway Act in relation to the safe construction and safe condition of vehicles, the EBA uses a system-based approach. The EBA therefore carries out:

- Systematic examinations of organisations and undertakings,
- Systematic examinations of vehicle types and design series, and
- Examinations of specific installations.

In the system audit of organisations, the procedures, responsibilities and structures specified by the State railways, applied by them to ensure the safety of vehicles are examined to assess their effectiveness and plausibility. When carrying out system audits of vehicle types and series, examinations differ according to vehicle type and series.

The aim of substantive testing during physical checks 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 the examination of process-related factors like the existence of certificates, the implementation of safety management systems in relation to the vehicle, etc.

Besides the preventative vehicle inspection, inspection resulting from a cause as a reactive inspection process forms a further part of vehicle inspection. The aim of inspection resulting from a cause is to protect against dangers in individual cases if these are necessary after an investigation into the facts of a case.

In 2010 the wheelsets of ICE trains and the vehicles of the Berlin S-Bahn were the focus for defect based monitoring. In addition, in the case of the Berlin S-Bahn the defect based monitoring was linked with systematic tests of the undertaking. The maintenance of axles of freight wagons after the serious accident in the Italian Viareggio was the subject of agreement and coordination. The EBA has been very much involved in this.

Operational railway inspection (Unit 34)

Unit 34 of the Federal Railway Authority is responsible for carrying out the monitoring of operations. This takes the form of an examination of an undertaking's systems (in part as an audit) and an examination of specific installations (physical inspection).

The system comprises an examination of the
1. Organisation and documentation of safety management systems,
2. Organisation and delegation of functions involving safety responsibilities,
3. Instructions to railway operation managers.

The examination of an undertaking's systems is usually carried out in cooperation with other EBA departments by special agreement.

A further object of railway inspection is the assessment of how the undertakings comply with their internal safety management systems (SMS). This was previously done when safety problems became known or when there were significant innovations. In this connection, the inspection also examines whether rail transport undertakings are further developing their SMS to constantly make them more effective and whether they make an appropriate response, on their own initiative, to the lessons of dangerous incidents. The examination of the undertaking's systems also focuses on the railway undertakings' procedures for risk assessment and risk control. The railway undertakings are required to demonstrate their ability to assess the effects on the level of safety of any changes in their processes and to initiate suitable compensatory measures.

The physical checking (inspection) of installations extends, among other things, to the following areas:

1. Organisational units of IMs and RUs responsible for planning, controlling and monitoring with implications for operational safety,
2. Organisational units of IMs and RUs responsible for staff management and planning with implications for operational safety,
3. Organisational units of the railway operation managers of IMs and RUs,
4. Organisational units charged with monitoring disruption in rail services,
5. Locally manned places for the operation of signalling equipment and installations (e.g. signal boxes and level crossing keepers' houses),
6. Places responsible for train formation, handling and preparation,
7. Visiting sites and travelling along sections of track on inspection journeys,
8. Visual inspections of standard and special vehicles and their loads,
9. Inspectors riding with the driver in the cab of railway vehicles,
10. Inspectors travelling in passenger trains to monitor safety devices, external doors of passenger coaches and the departure procedure,
11. Jobs within the risk area of the track relating to operational management and protection against threats to rail services.

To remedy safety-related issues, instructions were issued to rail transport and infrastructure undertakings to restore safety and order in railway operations. These instructions mostly related to the removal of situations that contravened the regulations, or the compliance with existing safety rules. In this connection it appeared that the railway undertakings had difficulties in some cases in ensuring that all the staff carried out the regulations in all situations. The violations of the rules found in railway operation were, however, generally only of minor importance from the safety point of view, so that the maintenance of the safety level by the railway undertaking was basically guaranteed.

H. Reporting on the application of the common safety methods (CSM) on risk evaluation and assessment

Regulation (EC) No 352/2009 of the Commission of 24 April 2009 on the specification of a common safety method for the evaluation and assessment of risks pursuant to Article 6(3)a of Directive 2004/49/EC of the European Parliament and of the Council is mandatory from 1 July 2012. However, it is already in use from 19 July 2010 for significant modifications to vehicles or significant modifications to structural subsystems in which Article 15(1) of the Directive 2008/57/EC or a TSI specifies this. For the projects developed in 2010 the transitional regulation applies to any projects in an advanced stage of development as per Article 2(4) of the Regulation (EC) No 352/2009.

The use of Regulation (EC) No 352/2009 was discussed in workshops with representatives of the undertakings and organisations of the German railway sector. In the results of this work the EBA has prepared a manual, which was published at the beginning of July 2010 under the title 'Instructions for the use of Regulation No. 352/2009 of the Commission of 24 April 2009 on the specification of a common safety method for the evaluation and assessment of risks as per Article 6(3)(a) of Directive 2004/49/EC of the European Parliament and of the Council by the EBA'. The document is available in the internet under the following link:
http://www.eba.bund.de/cln_033/nn_201964/DE/Infothek/Infrastruktur/Allg__Vorschriften/CSM__Risiko/CSM__Risiko__inhalt.html

For workshops with sector representatives the definition of what is a significant modification as well as how to apply this in practice became a particular problem. But the inclusion of the process in the CSM risk evaluation and assessment in the complete process of the approval of the commissioning of structural subsystems brings difficulties both for the internal processes of the applicant as for the interaction with the authority.

I. Conclusions – Priorities

The monitoring and inspections of the railway undertakings and infrastructure managers carried out by the Federal Railway Authority in 2010 showed, in general, no serious safety issues. The frequency of these issues has remained fairly constant for several years, as a result of which no critical influence on the level of safety can be inferred from them. Considering the actual trend in accidents of the past year with increasing traffic flows on the German rail network, the level of safety in railway operations can be said to be steady.

Where faults were discovered that had safety implications, the Federal Railway Authority issued instructions for the proper maintenance of railway equipment and vehicles and for the safe running of operations pursuant to Section 2(4) of the Railway Construction and Operation Order. The main initiatives and measures taken by the Federal Railway Authority to maintain and improve safety standards are

summarised in Section D, Part 1. Based on the findings in 2010, no specific examinations were ordered for 2011 in addition to regular monitoring with the previous priorities.

The new process orientation of the railway inspection on the permanent way and structural equipment introduced in 2010 should give EBA a better picture in future of the condition of the maintenance organisation of the infrastructure manager as well as an assessment of the effectiveness and functioning of the safety management systems, especially with respect to the implementation of a continuous improvement process. First experience and results of the process orientated railway inspection have not shown up any significant problems in the maintenance processes. Reliable statements regarding a continuous improvement process are not expected until 2012 and later. The assessment of the results of the process orientated railway inspection will be a priority subject in the supervision.

J. Annexes

ANNEX A: Railway Structure Information

A.1. Map of the rail network


DÄNEMARK
NIEDERLANDE
POLEN
BELGIEN
LUXEMBOURG
FRANKREICH
SCHWEIZ
ÖSTERREICH
TSCHECHISCHE REPUBLIK
Westerland
Flensburg
Kiel
Puttgarden
Sassnitz
Stralsund
Rostock
Lübeck
Hamburg
Bremen
Emden
Osnabrück
Münster
Hannover
Braunschweig
Magdeburg
Berlin Zoo
Frankfurt(O)
Stendal
Wittenberge
Uelzen
Leipzig
Halle
Dresden
Erfurt
Kassel
Göttingen
Köln
Düsseldorf
Aachen
Koblenz
Frankfurt a. M.
Mainz
Mannheim
Karlsruhe
Stuttgart
Ulm
Würzburg
Nürnberg
Regensburg
Passau
München
Augsburg
Freiburg
Basel
Lindau
Salzburg
Saarbrücken
Trier
Fulda
Hof
Chemnitz
Cottbus
Görlitz

A.2. Lists of railway undertakings and infrastructure managers

Up-to-date lists of public railway undertakings and rail infrastructure managers – as well as plenty of other information – can be found on the Federal Railway Authority website:

A.2.1. List of public rail infrastructure managers in Germany

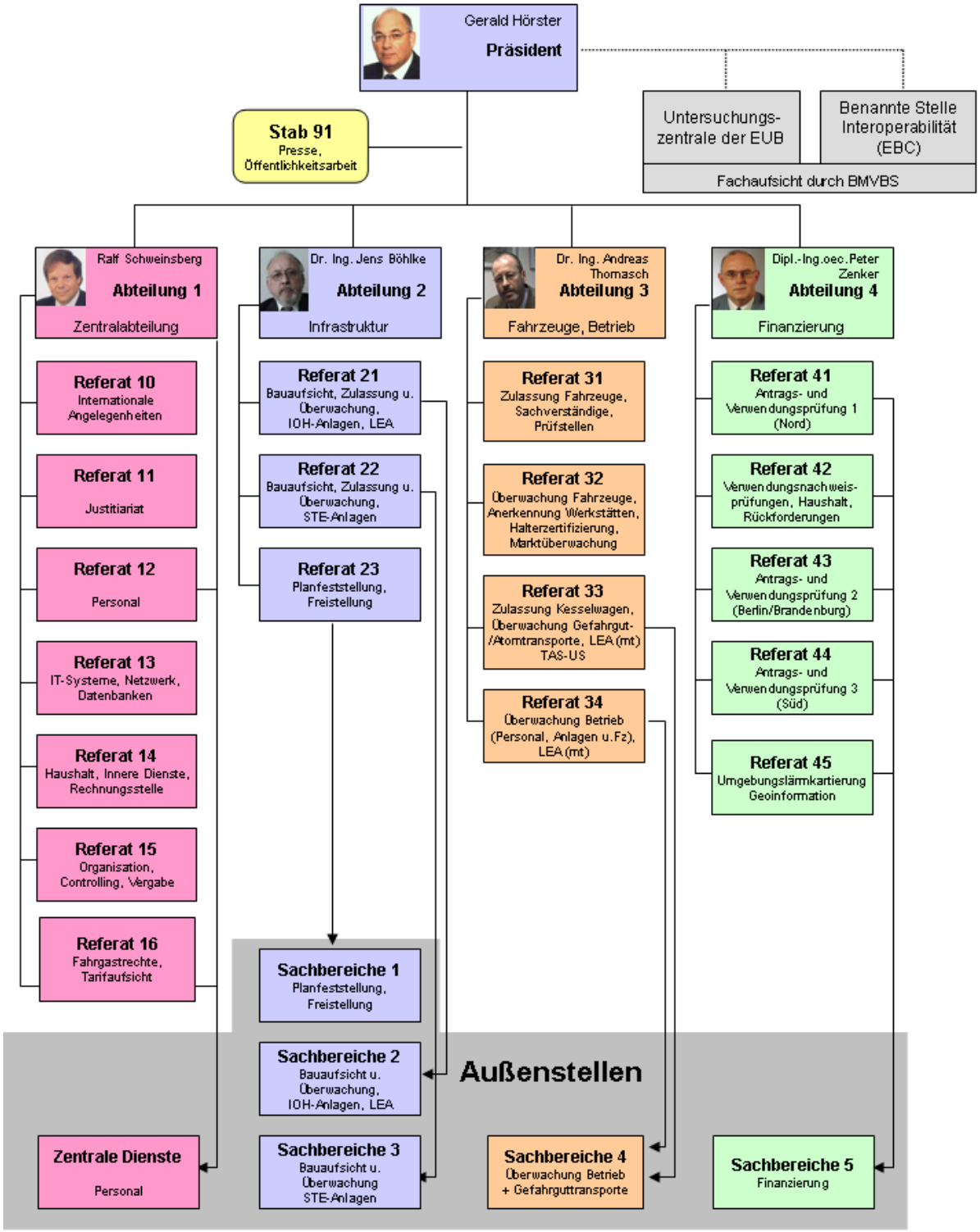
http://www.eba.bund.de/cln_007/nn_204046/DE/Infothek/Eisenbahnunternehmen/EIU/eiu__node.html

A.2.2. List of public railway undertakings in Germany

http://www.eba.bund.de/cln_007/nn_202596/DE/Infothek/Eisenbahnunternehmen/EVU/evu__node.html

ANNEX B: Organisational chart

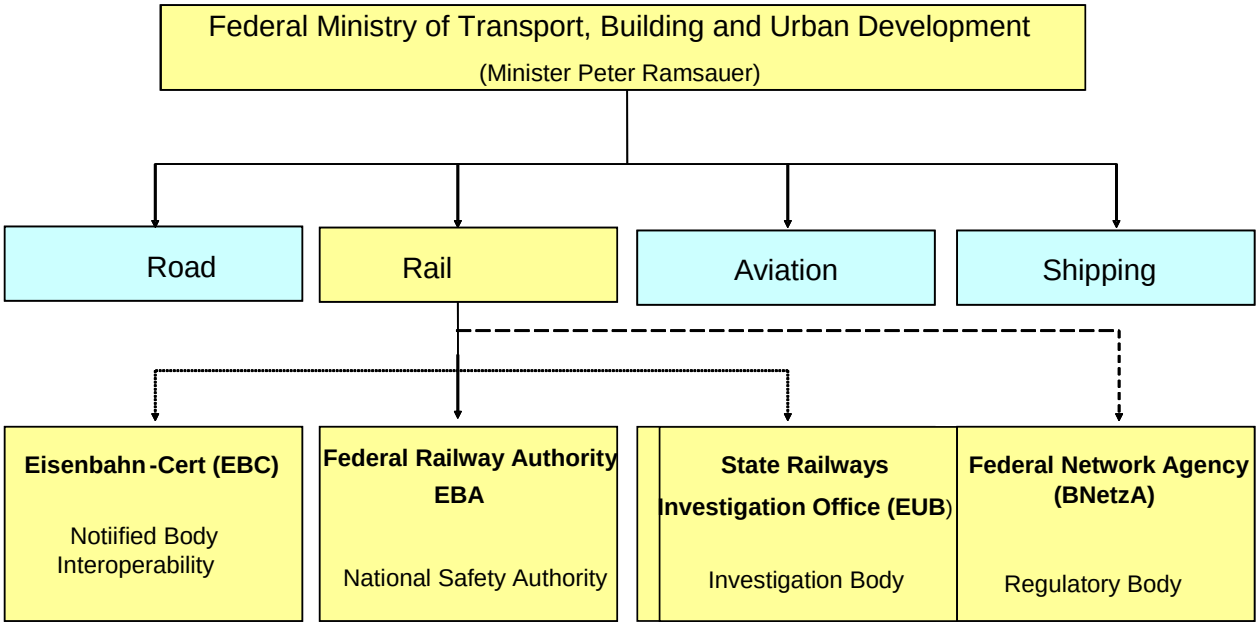
B.1.1. Diagram: Internal Organisation (as at May 2011)



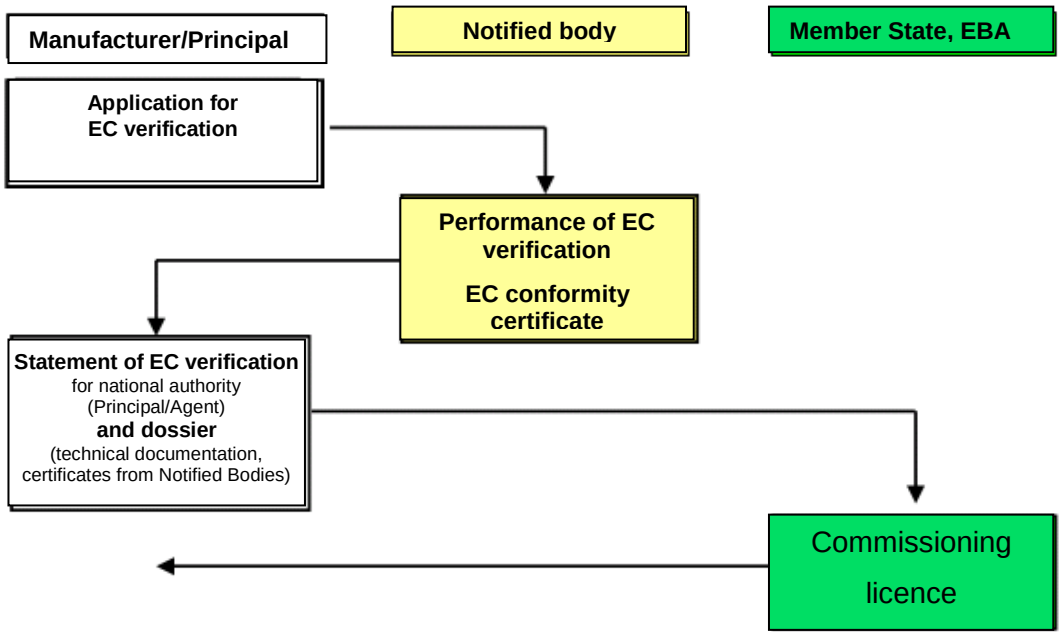
Gerald Hörster President			
Unit 91 Press Office		Investigation office of the EUB	Notified body interoperability (EBC)
		Specialist inspection by BMVBS	
Ralf Schweinsberg **Department 1** Central Department	Dr. Ing. Jens Böhlke **Department 2** Infrastructure	Dr. Ing. Andreas Thomasch **Department 3** Vehicles, operating	Dipl. Ing. oec. Peter Zenker **Department 4** Finance
Unit 10 International Affairs	**Unit 21** Building inspection, approval and monitoring IDH-premises, LEA	**Unit 31** Approval of vehicles, experts, testing facilities	**Unit 41** Application for and appropriation of funds 1 (North)
Unit 11 Legal	**Unit 22** Building inspection and monitoring signal, telecommunications and electrical equipment	**Unit 32** Monitoring of vehicles, approval of workshops, holder certification market monitoring	**Unit 42** Scrutiny of statements of appropriation of funds, budget, recovery
Unit 12 Staff	**Unit 23** Planning, making available	**Unit 33** Approval of tank wagons, monitoring of consignments of dangerous goods / nuclear material, State Railway Offices (LEA) (mt) TAS-US	**Unit 43** Application and appropriation of funds 2 (Berlin/Brandenburg)
Unit 13 IT systems, network, databases		**Unit 34** Monitoring operation (staff, equipment and vehicles), LEA (mt)	**Unit 44** Application for and appropriation of funds 3 (South)
Unit 14 Budget, Internal Services, Accounts Office			**Unit 45** Environmental noise mapping
Unit 15 Organisation, Controlling, Award			
Unit 16 Passenger law, tariff supervision	**Field 1** Planning, discharge		
	Field 2 Building inspection and monitoring IDH equipment, LEA	**External offices**	
Central Services Staff	**Field 3** Building inspection and monitoring STE equipment	**Field 4** Monitoring operation + transport of dangerous goods	**Field 5** Finance

B.1.2. Internal organisation - locations of EBA

B.2. Chart: Relation with other national bodies as at 12/2010



B.3. Chart: Cooperation with Notified Bodies



ANNEX C: CSI data – Definitions applied

C.1. CSI Data

Safety indicators pursuant to Annex 1 of Safety Directive (2004/49/EC)

1. Accident related indicators

1.1. Total number of significant accidents and (per million train-km) average number of significant accidents, broken down according to the following types of accident

	All types of accident	Collision of trains including collisions with obstacles within the loading gauge	Train derailment	Accidents at level crossings including those in which pedestrians were involved	lAccidents to persons caused by rolling stock in motion, with the exception of suicides	Vehicle fires	Other accidents
Total number	297	13	19	73	166	2	24
Average number	0.288	0.013	0.018	0.071	0.161	0.002	0.023

1.2. Total number and (based on million train kilometres) average number of serious and fatal injuries per type of accident broken down into the following categories

12.1 Serious injuries

	All types of accident	Collision of trains including collisions with obstacles within the loading gauge	Train derailment	Accidents at level crossings including those in which pedestrians were involved	Accidents to persons caused by rolling stock in motion with the exception of suicides	Vehicle fires	Other accidents
Total number of seriously injured	118	4	1	37	68	0	8
Average number of seriously injured	0.114	0.004	0.001	0.036	0.066	0.000	0.008
of which:							
Passengers	8	3	0	1	4	0	0
Average number of seriously injured passengers	0.008	0.003	0.000	0.001	0.004	0.000	0.000
Average number of seriously injured passengers per billion passenger kilometres	0.096	0.036	0.000	0.012	0.048	0.000	0.000
Average number of seriously injured passengers per billion passenger kilometres	0.010	0.004	0.000	0.001	0.005	0.000	0.000
Staff including staff of contractors	18	0	1	4	7	0	6
Average number of seriously injured staff including contractors	0.017	0.000	0.001	0.004	0.007	0.000	0.006
Users of level crossings	32	0	0	32	0	0	0
Number of seriously injured users of level crossings	0.031	0.000	0.000	0.031	0.000	0.000	0.000
Unauthorised persons on railway premises	29	0	0	0	29	0	0
Average number of seriously injured unauthorised persons on railway premises	0.028	0.000	0.000	0.000	0.028	0.000	0.000
Other persons	29	1	0	0	28	0	0
Average number of seriously injured other persons	0.028	0.001	0.000	0.000	0.027	0.000	0.000

1.2.2 Deaths

	All types of accident	Collision of trains including collisions with obstacles within the loading gauge	Train derailment	Accidents at level crossings including those in which pedestrians were involved	Accidents to persons caused by rolling stock in motion with the exception of suicides	Vehicle fires	Other accidents
Total number of deaths	146	0	0	45	101	0	0
Average number of deaths	0.141	0.000	0.000	0.044	0.098	0.000	0.000
of which:							
Passengers	0	0	0	0	0	0	0
Average number of deaths passengers	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Average number of deaths passengers per billion passenger kilometres	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Average number of deaths passengers per million passenger kilometres	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Staff including staff of contractors	8	0	0	1	7	0	0
Average number of deaths staff including contractors	0.008	0.000	0.000	0.001	0.007	0.000	0.000
Users of level crossings	44	0	0	44	0	0	0
Average number of users killed of level crossings	0.043	0.000	0.000	0.043	0.000	0.000	0.000
Unauthorised persons on railway premises	80	0	0	0	80	0	0
Average number of deaths Unauthorised persons on railway premises	0.077	0.000	0.000	0.000	0.077	0.000	0.000
Other persons	14	0	0	0	14	0	0
Average number of deaths Other persons	0.014	0.000	0.000	0.000	0.014	0.000	0.000

2. Indicators in relation to dangerous goods

Total number and (based on million train kilometres) average number of accidents in connection with the carriage of dangerous goods, broken down into the following categories

	Accidents, in which at least one railway vehicle carrying dangerous goods was involved	Accidents in which dangerous goods were released
Total number	2	2
Average number	0.002	0.002

3. Indicators relating to suicides

Total number and (based on million train kilometres) average number of suicides

	Suicides
Total number	899
Average number	0.871

4. Indicators relating to incidents and near misses

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

	All incidents and Near misses	Broken rails (only IM)	Rail buckles (only IM)	Signalling failures (only IM)	Signals passed at danger	Broken wheels	Broken axles
Total number	1030	599	71	0	352	4	4
Average number	0.998	0.580	0.069	0.000	0.341	0.004	0.004
				Resulting in an accident		4	4
				Found in service		4	4
				Found during regular maintenance		0	0

5. Indicators relating to the results of significant accidents

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

	Number of deaths and serious injuries multiplied with the value of avoiding accident victims	Costs of damage to vehicles or Infrastructure	Costs in connection with environmental damage *	Costs of delays caused by accidents
Total costs	316,156,540	57,764,418	not recorded separately	30,453,079
Average costs	306,270	55,958	not recorded separately	29,501

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

6.1 Automatic train protection

Percentage of tracks with automatic train protection (only IM)	93.2%
Percentage of tracks using operational train protection systems per train kilometre run	not available

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

	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	999	1,051	6,269	1,100	325	436	133
Average number per line kilometre	0.030	0.031	0.185	0.033	0.010	0.013	0.004
Average number per track kilometre	0.016	0.016	0.098	0.017	0.005	0.007	0.002

	Total number
Passively protected level crossings	7,080
Average number per line kilometre	0.209
Average number per track kilometre	0.111

7. Indicators in relation to safety management

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

* Costs in connection with environmental damage are included in the costs of damage given.
** The number of level crossings as specified in the new categories introduced in 2010 could in some cases be determined only approximately.

C.2. Definitions used in the annual report

C.2.1. Applicable definitions pursuant to (EC) Regulation No. 91/2003

Fatalities
Anyone who dies either immediately after an accident or within 30 days as a result of injuries sustained in an accident – with the exception of people who have committed suicide;

Seriously injured persons
Any injured person spending more than 24 hours in hospital after an accident, apart from people attempting suicide;

Passenger kilometres
The unit of measurement for the transportation of a passenger by rail over a distance of one kilometre. Only the distance covered in the territory of the reporting country is taken into account;

Passenger
A person travelling by rail who is not a member of staff. For the purposes of the accident statistics, passengers who try to jump on or off a moving train are included;

Suicide
An act of deliberate self-harm resulting in death, as registered and classified by the relevant national authority;

Significant accident
Any accident involving at least one moving railway vehicle in which at least one person is seriously injured or killed or which results in extensive damage to rolling stock, the tracks, other equipment or the surrounding area or considerable disruption to services. Accidents that occur in workshops and stores and at operational sites are excluded;

Train
One or more railway vehicles pulled by one or more locomotives or railway vehicles, or a single moving railway vehicle travelling under a specific number or a separate designation from a fixed starting point to a fixed finishing point. Light locomotives (locomotives running on their own) are not counted as trains;

Train kilometres
The unit of measurement for the movement of a train over a distance of one kilometre. The distance taken into account is – where known – the distance actually travelled; otherwise, the standard network distance between the start and end point is used. Only the distance covered in the territory of the reporting country is measured;

C.2.2 National requirements

For accident-based CSIs and CSIs relating to faults and near accidents, in addition to the definitions in regulation (EC) No. 91/2003, the definitions of Annex 1 of Directive 2004/49/EC of the European Parliament and of the Council amended by Directive 2009/149/EC were used to the greatest possible extent to calculate the common safety indicators and common methods for the accident cost. These definitions were published with the EBA's guidance note on the drafting of safety reports. The guidance note is available online under the Link

http://www.eba.bund.de/cln_016/nn_201964/DE/Infothek/Bahnbetrieb/Sicherheitsbericht/sicherheitsbericht__inhalt.html

If an accident leads to other types of accident (e.g. a derailment leads to a fire), recording is under the type of accident that triggered the chain. This applies regardless of the severity of the consequences of the accident.

A deviation from the definitions given in Chapter C.2.1 in regulation 91/2003 exists in the definition of a train regarding the consideration given to light locomotives:

Train
One or more railway vehicles pulled by one or more locomotives or railcars or a single railway vehicle travelling under a specific number or a separate designation from a fixed starting point to a fixed finishing point. A light locomotive that is to say a locomotive running alone is also considered to be a train.

C.3. Abbreviations

CSI	Common Safety Indicator
ERA	European Railway Agency
BÜ	Bahnübergang (Level crossing)
Million	10^6
Billion	10^9

ANNEX D: Important changes in legislation and regulation

	Legislation	Date on which legislation came into force	Reason for introduction (details of the new law or change to the existing law)	Description
General legislation on safety in national rail traffic				
Legislation in relation to the national safety authority				
Legislation in relation to notified bodies, assessors, external registration authorities, investigations, etc.				
National provisions on rail safety				
Regulations for national safety targets and methods				
Regulations on the requirements for safety management systems and the safety certification of railway undertakings				
Regulations on the requirements for safety management systems and the safety authorisations of infrastructure managers				
Regulations in relation to the requirements for wagon holders				
Regulations on the requirements for maintenance operators				
Regulations on the requirements for the approval of the commissioning and maintenance of new and significantly modified vehicles including rules for the exchange of vehicles between railway undertakings, registration systems as well as requirements for test procedures				
Common operating rules for the railway network, including rules for the signalling and traffic control system				
Regulations on the requirements for additional undertaking internal operating regulations, which must be issued by the infrastructure managers and railway undertakings				

Regulations on the requirements on staff entrusted with safety relevant tasks, including selection criteria, medical suitability, training and approval				
Regulations on the investigation of accidents and defects, including recommendations				
Regulations on requirements on the national safety indicators, including the recording and analysis of the indicators				
Regulations on the requirements for the approval of the commissioning of the infrastructure (rails, bridges, tunnels, energy, ATC, radio, signals, locking, level crossings, platforms, etc)				

ANNEX E: Development of safety certification and authorisation – Numerical data

E.1. Safety certificates as per Directive 2001/14/EC

Number of safety certificates issued in 2010 pursuant to Directive 2001/14/EC for railway undertakings	with a licence issued in Germany	0
	with the licence of another Member State:	0

E.2 Safety certificates as per Directive 2004/49/EC

		New	Updated/ amended	Renewed
E.2.1. Number of valid safety certificates pursuant to **Part A** for railway undertakings in 2010	registered in Germany:	6	0	0
	registered in another Member State:	0	0	0

		New	Updated/ amended	Renewed
E.2.2. Number of valid safety certificates pursuant to **Part B** for railway undertakings in 2010	registered in Germany:	6	0	0
	registered in another Member State:	4	0	0

			A	R	P
E.2.3. Number of applications for safety certificates (pursuant to **Part A**) from railway undertakings in 2010	registered in Germany:	new certificates	0	0	1
		updated/amended certificates	0	0	0
		renewed certificates	0	0	0
	registered in another Member State for:	new certificates	0	0	0
		updated/amended certificates	0	0	0
		renewed certificates	0	0	0

			A	R	P
E.2.4. Number of applications for safety certificates (pursuant to **Part B**) from railway undertakings in 2010	registered in Germany for:	new certificates	0	0	1
		updated/amended certificates	0	0	0
		renewed certificates	0	0	0
	registered in another Member State for:	new certificates	1	0	1
		updated/amended certificates	0	0	0
		renewed certificates	0	0	0

A = *accepted:* accepted application, certificate has already been issued
R = *rejected:* rejected application, certificate was not issued
P = *pending:* decision still outstanding, no certificate yet issued

E.2.5. List of countries in which railway undertakings applying for a safety certificate Part B in Germany have already received a safety certificate Part A.

Austria, Belgium, Denmark, France, Netherlands, Poland, Sweden

E.3. Safety authorisations according to Directive 2004/49/EC

	New	Updated/ amended	Renewed
E.3.1. Number of valid safety authorisations held by infrastructure managers registered in Germany in 2010.	11	0	0

(provisionally issued in accordance with Section 35(5)(c) of the General Railway Act)

		A	R	P
E.3.2. Number of applications received for safety authorisations for infrastructure managers registered in Germany in 2010.	new licences	0	0	2
	updated/amended licences	0	0	0
	renewed licences	0	0	0

A = *accepted:* accepted application, licence has already been issued
R = *rejected:* rejected application, licence was not issued
P = *pending:* decision still outstanding, no licence yet issued

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

		New	Updated/amended	Renewed
Mean time after having received all necessary information between the receipt of an application and the final delivery of a Safety Certificate **Part A** in year 2010 for Railway Undertakings.	registered in Germany:	24 months*	/	/
	registered in another Member State:	/	/	/

E.5. Procedural aspects – Safety Certificates (Part B)

		New	Updated/amended	Renewed
Mean time after having received all necessary information between the receipt of an application and the final delivery of a Safety Certificate **Part B** in year 2010 for Railway Undertakings.	Registered in Germany:	24 months*	/	/
	Registered in another Member State:	20 months*	/	/

* These figures include the total time from receipt of application to the issuing of the certificate including waiting time for the delivery of documents and certificates. This should not just be seen as processing time. For German undertakings the processing of the applications for Part A and Part B is done together and so the times are identical.

E.6. Procedural aspects – Safety Authorisations

		New	Updated/amended	Renewed
Mean time after having received all necessary information between the receipt of an application and the final delivery of a Safety Authorisation in year 2010 for Infrastructure Managers.	registered in Germany:	/	/	/
	registered in another Member State:	/	/	/

ANNEX F – Abbreviations

AEG	*Allgemeines Eisenbahngesetz* General Railway Act
BEGebV	*(Bundeseisenbahngebührenverordnung* Regulation on fees and charges of the State rail transport administrations (State Railway Fees Regulation)
BEVVG	*Bundeseisenbahnverkehrsverwaltungsgesetz* State Rail Management Act
BMVBS	*Bundesministerium für Verkehr, Bau und Stadtentwicklung* Federal Ministry of Transport, Building and Urban Development
BMVIT	*Bundesministerium für Verkehr, Innovation und Technologie* Federal Ministry for Transport Innovation and Technology (Austria)
BNetzA	*Bundesnetzagentur* Federal Network Agency
BSWAG	*Bundesschienenwegeausbaugesetz* Federal Railway Development Act
COTIF	*Convention relative aux transports internationaux ferroviaires* Convention concerning International Carriage by Rail
CSI	Common Safety Indicators
EBA	*Eisenbahn-Bundesamt* Federal Railway Authority
EBC	*Eisenbahn-Cert* Notified Interoperability Body
EBO	*Eisenbahn-Bau- und Betriebsordnung* Railway Construction and Operation Order
EIU	*Eisenbahninfrastrukturunternehmen* IM Infrastructure Manager
ERA	European Railway Agency
ESiV	*Eisenbahn-Sicherheitsverordnung* Railway Safety Regulation
EUB	*Eisenbahn-Unfalluntersuchungsstelle des Bundes* State Railways Investigation Office
EVU	*Eisenbahnverkehrsunternehmen* RU Railway Undertaking
GSM-R	Global System for Mobile Communications – Rail
HBD	Hot box detector
IOH	*Ingenieur-, Ober- und Hochbau* Permanent-way and structural equipment
LST	*Leit- und Sicherungstechnik* Control and Safety Equipment
ObÜ	*Objektbezogene Überwachung* Monitoring of Installations
RID	*Règlement concernant le transport international ferroviaire de marchandises Dangereuses* International Rules for the Transport of Dangerous Goods by Rail
SMS	Safety Management System
STE	Signalling, Telecommunication and Electrical Equipment
TEIV	*Transeuropäische-Eisenbahn-Interoperabilitätsverordnung* Trans-European Railway Interoperability Regulation
TSI	Technical Specification for Interoperability
UbÜ	*Unternehmensbezogene Überwachung* Monitoring of undertakings
VV EA	*Verwaltungsvorschrift zur Eisenbahnaufsicht über bauliche Anlagen* Administrative regulation on the inspection of railway structures
VV TAU	*Verwaltungsvorschrift über die Eisenbahnaufsicht von baulichen und maschinentechnischen Anlagen und Durchführung der technischen Arbeitsschutzaufsicht* Administrative regulation on the inspection of structural and mechanical rail equipment and performance of the technical inspections of safety in the workplace
VV TAU-STE	*Verwaltungsvorschrift für die Eisenbahnaufsicht über Signal-, Telekommunikations- und Elektrotechnische Anlagen* Administrative regulation for the inspection of railway signalling, telecommunication and electrical equipment
WKV	*Weichenklammerverschluss* Switch clamp lock