Federal Ministry of Transport,
Building and Urban Development

Management of the
Federal Railway Accident Investigation
Office

Railway
Accident Investigation

ANNUAL REPORT

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Foreword

This Annual Report provides details of the activities of the Federal Railway Accident Investigation Office [Eisenbahn-Unfalluntersuchungsstelle des Bundes (EUB)] in accordance with Directive 2004/49/EC (the Railway Safety Directive).

The Annual Report only contains details of investigations which were carried out by the Federal Ministry of Transport, Building and Urban Development [Bundesministerium für Verkehr, Bau und Stadtentwicklung] acting as the investigating body in accordance with Article 5(1)(f) of the General Railways Act [Allgemeines Eisenbahngesetz (AEG)].

In the year under review, four accidents were investigated in accordance with Article 19 of the Railway Safety Directive.
In addition, the Annual Report contains information on the safety recommendations issued in the period under review and the measures taken by those involved on the basis of the safety recommendations issued.

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1. Federal Railway Accident Investigation Office (EUB)

1.1 Statutory basis

Directive 2004/49/EC on safety on the Community's railways (the Railway Safety Directive) required EU Member States to set up a safety authority (Article 16) and an independent investigating body (Article 19).

The Railway Safety Directive was transposed into national law in Germany by the Fifth Railway Regulations Amendment Act of 16 April 2007 and the Second Regulation on the Enactment and Amendment of Railway Regulations of 5 July 2007.

The requirements for its structure and composition and the conduct of investigations were set down and fine-tuned by the Federal Ministry of Transport, Building and Urban Development's in its organisational decree 'On the creation of a "Federal Railway Accident Investigation Office" in accordance with Article 5(1)(f) of the General Railways Act'.

1.2 Aim and purpose of investigation

The aim and purpose of the investigations is to establish the causes of dangerous events and hence to derive ways of improving safety. Investigations by the Federal Railway Accident Investigation Office do not serve to establish fault or to clarify issues of liability or other claims in civil law. They are conducted independently of any judicial investigation.

Investigation includes collecting and evaluating information, drawing up conclusions including establishing the causes and, as appropriate, issuing safety recommendations. The Investigation Office's proposals for avoiding accidents and improving the safety of rail traffic are notified to the safety authorities and, as necessary, to other bodies and authorities and other EU Member States in the form of safety recommendations.

1.3 Reporting, categorising and investigating dangerous events

The obligation to report and the format for reports are specified in the 'Decision of general application on reporting dangerous events in railway operations' [Allgemeinverfügung zum Melden von gefährlichen Ereignissen im Eisenbahnbetrieb] which supplements

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Article 2(3) third sentence of the Railway Accident Investigation Regulation [Eisenbahn-Unfalluntersuchungsverordnung (EUV)].
A fundamental distinction between accidents and incidents is made when considering dangerous events within the meaning of this Decision of general application.
An accident is defined as an unwanted or unintended sudden event in railway operations or a specific chain of such events which has harmful consequences for people, property or the environment. Accidents are classified into the following types of event:

- collisions;
- derailments;
- accidents involving persons;
- level crossing accidents;
- rolling stock fires; and
- other railway operating accidents.

An incident is an occurrence in railway operations which compromises the safe operation of trains, without having immediate harmful consequences for people, property or the environment. Included in these are:

- signals passed at danger;
- unauthorised entry to an occupied section of line;
- incidents at level crossings;
- incidents involving rolling stock;
- incidents involving infrastructure;
- incidents caused by operational error.

These events are to be reported by daily, supplementary and immediate reports to the Federal Railway Accident Investigation Office via infrastructure managers depending on the consequences of those events.

After reception of the reports in question they are categorised. In this process, a distinction is made between three different categories:

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Category A: ‘serious accident’

These events are defined in Article 5(1)(f)(1) and (2) of the General Railways Act. Investigations are conducted exclusively in accordance with principles laid down by the management of the Federal Railway Accident Investigation Office.

Category B: ‘other events worthy of investigation’

These are events that must be reported immediately but are not to be placed in category A, together with events for which the cause is unclear or there is a suspicion of systematic failings.

Accidents are investigated directly by the Central Investigation Office of the Federal Railway Accident Investigation Office itself. Investigation of the facts may take place on site and/or by making appropriate enquiries in accordance with Article 2(4) of the Railway Accident Investigation Regulation.

Category C: ‘other dangerous events’

These are events that are must be reported but which are not to be placed in categories A or B.

The Central Investigation Office of the Federal Railway Accident Investigation Office does not investigate ‘other dangerous events’ itself. The reports received are checked for plausibility, in specific individual cases, databases are consulted and subsequently the reports received are added to the accident database for follow up.

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2 Investigation

2.1 General remarks

In the period under review, four events were placed in category A and the appropriate investigations conducted by the investigating body in accordance with Article 5(1)(f)(2)of the General Railways Act. These events are described in greater detail in Sections 2.1.1-2.1.4.

2.1.1 Collision between trains in Berlin-Karow station on 16 April 2009

(for missing pictures see the original version)

Short description:

At about 22:16 on 16 April 2009 there was a collision in Berlin-Karow station between train RE 38399 running on the through line (track 2) towards Berlin-Blankenburg and freight train FTZ 53185 also leaving for Berlin-Blankenburg.

In accordance with the Special Traffic Notice [Fahrplananordnung (Fplo)] for that day, the freight train was to run through but continue on via Berlin-Blankenburg. RE 38399, which was also running through, ran into the last wagon of the freight train.

Consequences:

Eleven passengers were slightly injured and two staff members severely injured.
In addition, there was severe damage to the installations and rolling stock estimated as being some EUR 800 000.

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Causes:

The draft investigation report has been drawn up and, in accordance with Article 5(4)(1) of the Railway Accident Investigation Regulation; those involved now have the opportunity to comment on the facts and conclusions which are relevant for determining the causes of the accident.

Safety recommendations:

The draft includes safety recommendations.

2.1.2 Other railway operating accident in train RE 10123 running between Lövenich and Horrem on 27 June 2009

Short description:

At about 20:25 on 27 June 2009, Regional Express RE 10132 came to rest on the line between Lövenich and Horrem because of a binding brake. Because of a build up of smoke in the train, passengers got out on to the open line.

Consequences:

The straight air brake of the driving trailer was rubbed during the journey, the brake pads overheated and in this specific case led to scorching of the pipe-work. The smoke from this was sucked into the coaches by the air conditioning and thus got into the passenger accommodation.
Twenty-four people were slightly injured, of whom twenty were passengers and four police officers.

Causes:

A straight air brake applied or not completely released led to the incident. The investigation has not yet been completed.

Safety recommendations:

In accordance with Article 6 of the Railway Accident Investigation Regulation, a safety recommendation worded as follows was issued.

‘At least investigate the following:

1. Whether it is necessary to retrofit warning lights within the driver's field of vision which would indicate to him that the straight air brake on the driving trailer had been applied or that it had not been completely released.
2. Whether operating measures up to prohibiting the use of straight air brakes when running with a driving trailer leading are to be initiated.
3. Whether the air intake for the air conditioning should be moved to another suitable site, away from the braking equipment.'

2.1.3 Derailment on the Bünde (Westphalia) to Bruchmühlen line on 17 July 2009


Short description:

A hot box on train 61084 was detected at about 00:20 on 17 July 2009 between Bruchmühlen and Bünde (Westphalia) on the line from Löhne to Rheine at km 102.190. The train came to rest at km 99.2 after it was stopped by the signaller at Bünde.

After investigating, the driver confirmed that the leading bogie of the sixteenth wagon, loaded with fuel oil, had derailed.

Consequences:

There was no personal injury nor did any dangerous goods escape. The permanent way was severely damaged.

Causes:

The investigations carried out to date show that the derailment is to be attributed to a broken axle, itself the result of an axle box running hot.

Safety recommendations:

In the context of the investigation of the accident and in accordance with Article 6 of the Railway Accident Investigation Regulation, a safety recommendation worded as follows was issued:

'The following rolling stock-related measures are currently recommended to avoid further axle failures caused by hot boxes:

- replace riveted brass cages by plastic bearing cages;
- investigate whether fitting further derailment detectors and/or hot box detectors could contribute to preventing derailments.'

2.1.4 Derailment in Nuremburg Stein on 7 August 2009

(for missing pictures see the original version)

Short description:

On 7 August 2009 freight train FIR 51629, running from Seelze to Nuremburg marshalling yard, derailed between Nuremburg Stein and Nuremburg marshalling yard.

The train, which was hauled by electric locomotive 152 068, consisted of 24 wagons and had a trailing weight of 1 483 tonnes and a length of 466 m.

The location of the derailment was on a curve with a radius of 350 m. The wagons which derailed were the sixth to the eighteenth in the train. The train divided between the sixth and seventh wagon.

Consequences:

The derailment caused significant damage to rolling stock and infrastructure.

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Cause:

The freight train derailed because the track spread under the moving train.

The draft investigation report has been drawn up and will shortly be sent to those involved in accordance with Article 5(4)(1) of the Railway Accident Investigation Regulation. Those involved will then have the opportunity to comment on the facts and conclusions which are relevant for determining the causes of the accident.

Safety recommendations:

The draft includes safety recommendations.

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3 Safety recommendations

In accordance with Article 6 of the Railway Accident Investigation Regulation, the body responsible for the investigation of serious accidents may issue safety recommendations at any time. These are to be addressed to the safety authorities and, as necessary, to other bodies or authorities or to other EU Member States.

The safety recommendations made in the period under review are summarised again in Section 3.1. The following section includes information on the action that has already been taken as a result of earlier safety recommendations.

3.1 Safety recommendations made in 2009

3.1.1 Other railway operating accident in train RE 10123 running between Lövenich and Horrem on 27 June 2009

Safety recommendations:

‘At least investigate the following:

1. Whether it is necessary to retrofit warning lights within the driver’s field of vision which would indicate to him that the straight air brake on the driving trailer had been applied or that it had not been completely released.
2. Whether operational measures going as far as prohibiting the use of straight air brakes when running with a driving trailer leading are to be initiated.
3. Whether the air intake for the air conditioning should be moved to another suitable site, away from the braking equipment.’

Information about the measures already taken:

On 1: The rebuild described in the safety recommendation has been in hand since 2007. Nothing requires to be checked here.

On 3: A request to investigate is not a safety recommendation but documents that the investigation of the accident is not yet finished.

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3.1.2 Derailment on the Bünde (Westphalia) to Bruchmühlen line on 17 July 2009

Safety recommendations:

'The following rolling stock-related measures are currently recommended to avoid further axle failures caused by hot boxes:

- Replace riveted brass cages by plastic bearing cages
- Investigate whether fitting further derailment detectors and/or hot box detectors could contribute to preventing derailments.'

Information about the measures already taken:

On the first bullet point:

A start on evaluating the action recommended has been made.

On the second bullet point:

A request to investigate is not a safety recommendation but documents that the investigation of the accident is not yet complete. Irrespective of that, the deliberations are being taken further within the ERA as well in the RID [Committee of Experts] at European level.

3.2 Feedback on measures taken as a result of earlier safety recommendations

Subsections 3.2.1 and 3.2.1 provide feedback on safety recommendations made in 2007 and 2008.

3.2.1 Feedback on safety recommendations from 2007

3.2.1.1 Collision in Berlin Südkreuz on 20 November 2006

Safety recommendations:

'Send the expert's report to S-Bahn Berlin GmbH.

Issue a notice to the S-Bahn Berlin GmbH containing the requirement to ensure that the sanding equipment on class 480 and 481 S-Bahn trains works reliably and it always contains enough sand.

Check the design of the brake system of vehicles of classes 480 and 481 in conjunction with the manufacturer and operator taking the points made by the expert into account.

Prepare a hazard analysis to combat the probable cause of this accident, the combination of "dirty rail head and slight dampness", or to limit their effects by appropriate operational measures.'

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Information about the measures already taken:
The railway undertaking is in the process of providing evidence of changes to the braking system. In the meantime, speed restrictions apply to operations.

3.2.1.2 Derailment in Rotenburg/Wümme on 28 February 2007

Safety recommendations:
'Ask specialist groups to consider to whether and to what extent the distance between hot box detection installations can or must be improved to be able to respond more effectively to a hot box which is developing relatively quickly; take the findings of the accident investigation and the results of the report on the metallurgical tests into account.'

Information about the measures already taken:
Potential improvements relating to the spacing required, options for detection and basic assumptions on the rate of heating have been discussed with the infrastructure manager. A start has been made on writing the requirements and the functional specification for the hot box detection installations.

3.2.2 Feedback on safety recommendations from 2008

3.2.2.1 Derailment in Cologne central station [Köln Hbf] on 9 July 2008

Safety recommendations:
'The safety recommendation for ICE-3 multiple units with axles of 34CrNiMo6 material is as follows:
Examine incoming data for the materials for evidence of its fatigue strength when designing axles to take account of the structural inhomogeneity discovered in the course of the tests done by the Federal Institute for Materials Research and Testing [Bundesanstalt für Materialforschung und Prüfung (BAM)].'

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Information about the measures already taken:

All axles have been and are being tested for internal flaws by non-destructive methods.

A start has been made on considering the speed of crack propagation, techniques include calculations and tests and the results will be used to confirm the test intervals. Neither approach has been carried through completely.

3.2.2.2 Collision between trains in Recklinghausen Ost on 25 November 2008

Safety recommendations:

'Investigate, at least, whether drivers of light engines fitted with disc brakes must notify the signaller if sanding equipment has been used or initiated automatically and the locomotive has come to a stop, so as to avoid wrong side indications by track circuits indicating that the track is clear.'

Information about the measures already taken:

On the basis of the safety recommendations, the safety authority has issued instructions to infrastructure managers and railway undertakings.