



## Supporting European railway safety through accident investigation

Rajan, J., Accou, B., Duquenne, N.,  
Niedwiedski, A., Rebentisch, M., Rumping, R.

European Railway Agency,  
120 Rue Marc le Francq,  
59300, Valenciennes, France.

### *Abstract*

*Independent investigation bodies are an integral part of the development and maintenance of railway safety in each Member State. Their role and scope of investigation is outlined in the Railway Safety Directive (2004/49/EC). The European Railway Agency has had a central role in the co-ordination of national investigation bodies (NIBs) at a European level, providing a focus for work on the development of common methods and approaches, sharing guidance and facilitating the exchange of experience.*

*The Agency website now provides access to the largest European database of serious accident investigations (from 1990 to the present day). Through the Agency's website investigation bodies can report investigations, access documents on line and report urgent safety information through the newly developed Safety Information System.*

*The European Union's network of national investigation bodies is now well established and the Agency is working with the bodies to develop guidance, good practice and common approaches in:*

- Accident and incident classification*
- Safety recommendations*
- Accident investigation methodology*
- The training and competence of accident investigators*

*This paper presents key developments in European wide accident investigation approaches, the benefits of a European wide approach and planned future developments to support railway safety development in the European Union.*

### *Background*

Independent national accident investigation bodies (NIBs) are now legally established in all Member States (<sup>1</sup>) of the European Union. The requirements for such bodies and their role and the scope of investigation is outlined in the railway safety Directive (2004/49/EC) which came into force in April 2006.

This Directive outlines key elements for assuring independence, the processes of investigation and reporting (Articles 19-25 and Annex V). The legislation includes the organisational relationship of the investigation body to other rail authorities, the rail sector and bodies in the Member States. It also lists key elements for the investigation process including access to evidence, relationship with the judiciary,

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<sup>1</sup> Includes Norway but excludes Malta and Cypress which do not have a railway

type of accidents to be investigated, reporting accidents and making recommendations. A 'blueprint' for the elements of the final investigation report is given in Annex V to this legislation.

### *Role of the Agency*

The role of the Agency is to support the national investigation bodies (NIBs) in their working implementation of the Directive. The Agency also has a central role in the co-ordination of national investigation bodies at a European level, providing a focus for work on the development of common methods and approaches, sharing guidance and facilitating the exchange of experience.

The railway safety directive introduces across Europe an approach to investigation which is based on independence, no allocation of blame, openness in the process and public reporting of accidents. This includes annual reporting of the recommendations made for the improvement of safety and the response to such recommendations (in most cases by the NSA) .

In some Member States independent investigation bodies were already established prior to 2006, often within a multi-modal body. In others the approach of the Safety Directive has required a cultural shift, presenting a diverse basis from which to develop European common methods and approaches to accident investigation amongst NIBs.

### *Network of Investigation Bodies*

The European Union's network of national investigation bodies is now well established, shortly to hold its 13<sup>th</sup> meeting. The Agency is working with the bodies to develop guidance, good practice and common approaches on topics including:

- Accident investigation methodology;
- The training and competence of accident investigators;
- Accident and incident classification;
- Safety recommendations.

Other key topics addressed by the NIB Network have included NIB relationships with the judiciary, requirements for on board data recorders, safety management systems, level crossing accidents and common safety indicators. Regular presentations on investigations in progress or recently completed support a sharing of knowledge and good practice in investigation.

### *Accident investigation methodology*

The development of common methods and approaches has been supported by the development of guidance to the Articles in the safety directive jointly by ERA and task forces from the NIB network. This guidance currently covers articles 19 (the obligation to investigate) and 25 (safety recommendations) and will be developed to cover all the relevant articles by the end of 2010.

To support the understanding of the accident investigation process a project is being undertaken (by the University of Glasgow) to consider accident investigation methodologies available and their suitability for railway accident investigation, in order to provide a basis for discussion of common approaches, expertise and experience in their application.

### *Training and competence of investigators*

The NIBs have worked together to develop a catalogue of current training (international) that is available for different aspects of an investigator's training, and a survey of the NIBs current practice and view on training has led to the development of a paper on the current position of training of rail accident investigators (including Investigators in charge) in the EU. The next steps will be discussed in the coming months and will consider if there is common training possible for the NIBs and if so, the content format and options for the delivery of such training.

### *Accident and Incident classification*

Annex V of the Railway Safety Directive 200/49/EC (RSD) introduces (4.3 Conclusions) the following 3 levels of causation to be considered in an investigation and when reporting:

- *direct and immediate causes of the occurrence including contributory factors relating to actions taken by persons involved or the condition of rolling stock or technical installations,*
- *underlying causes relating to skills, procedures and maintenance,*
- *root causes relating to the regulatory framework conditions and application of the safety management system.*

This reflects the idea that an accident investigation represents an opportunity to examine the overall safety management within -and the wider impact of the regulatory framework on and beyond- an organisation, with a view to preventing future accidents that share the same underlying or root causes.

To support an understanding of these 3 levels the Agency has developed a classification scheme of causes, which provides a structured framework and a standard terminology that will help the investigation to go deeper than a factual report that simply answers the question "What happened, where and when?"

It will lead the investigation to examine the conditions that existed at the time of the occurrence and which influenced the performance of all system components involved; as well as those parts of the organisational framework that allowed these conditions to exist. By doing so, it will support the fundamental purpose of a safety investigation: to identify and understand the factors that contributed to an occurrence and to provide input for the drafting of recommendations that hopefully will prevent future (similar) occurrences.

A classification has been developed taking into account technical and scientific progress in accident investigation (article 21.7) and is currently being piloted on investigations in progress.

### *Safety recommendations*

In August 2009 the first guidance about accident investigation was published: guidance on safety recommendation.

The safety directive requires that safety recommendations shall be addressed to the national safety authority, and this approach was a change in process for many investigation bodies. It takes into account that in an interoperable railway it is very difficult for an NIB to have a good overview of all the actors involved in railway operations and maintenance, in particular that (with the exception of ‘other bodies’ such as the emergency services):

- *Only the national safety authority (NSA) has an overview over the national railway sector and is able to find out whether others actors may be affected by the same problem raised in a safety recommendation,*
- *Only the safety authority has the power to enforce measures if necessary,*
- *If recommendations are addressed directly to a railway undertaking or an infrastructure manager this may give rise to a legal concern, if*
  - *the railway undertaking or the infrastructure manager implements a recommendation but the safety authority doesn’t agree or*
  - *a single railway undertaking implements a safety recommendation but it becomes obvious that other railway undertakings are affected by a similar problem.*

The guidance is a useful tool which supports common understanding but nevertheless leaves the Member States the discretion of dealing with safety recommendations in their own way as long their practice is in accordance with the RSD . A second part of this guidance, considering “good practice” is currently under discussion.

### *Public Database*

The Agency website now provides access to the largest and most complete European database of serious accident investigations (from 1990 to the present day). Its includes serious accidents and all other accidents investigated by the

NIBs and reported according to the safety directive, it also includes an historical database that has researched serious rail accidents back to 1990.

This database is public and can be accessed through the Agency's website along with the annual reports, safety performance reporting and common safety indicators (which include key statistics for significant accidents) at [www.era.europa.eu](http://www.era.europa.eu).

In order to facilitate the exchange of urgent and important safety information a safety information system (SIS) has been established for urgent safety notices, that disseminates information between NIBs and national safety authorities.

EMSA and EASA both make use of the ECCAIRS database system developed by the Joint Research Centre (JRC) of the European Communities to support accident reporting. A feasibility study to assess the suitability of ECCAIRS for rail is in progress, and work underway to consider the future database requirements to support effective reporting and monitoring of serious accidents across the EU.

### *The future*

The NIB network is now well established and most NIBs are in place and investigating serious accidents. The Agency continues to support NIBs in their investigations when requested and to facilitate the exchange of information on investigations. The Network is now looking forward in its programme of work to support NIBs work more effectively harnessing the knowledge and experience of a wider European base. This will include consideration of common training, the wider development of guidance, development of the database and of reporting mechanisms and further development of common methods and approaches to accident investigation. The focus is how the lessons learned from accidents at a European level can be investigated, analysed and understood. The objective is to maintain the high level of safety already present in European railways throughout the development of an open railway market and to facilitate practicable improvements in safety whilst maintaining competitiveness.

### *References*

Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004. (Railway Safety Directive).