



European Railway Agency



An agency of the
European Union

Railway accident investigation

Introduction

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Objective and responsibilities

All

- Railway Undertaking (RUs),
- Infrastructure Managers (IMs),
- National Safety Authorities (NSAs),
- National Investigation Bodies (NIBs),
- Other stakeholders

must **recognise** and **accept** their and each others' roles and responsibilities

also **with regard to investigating accidents and incidents**

to safeguard a sustainable and safe development of the railway system



The rise of safety management systems

- › 6th July 1988
- › 167 lost, only 62 survivors
- › Lord Cullen's recommendations (106) move away from prescription to risk awareness and safety cases as a more effective system.



What is the relation between Safety Culture and Safety Management?

- › “Through the safety management system, infrastructure managers and railway undertakings shall promote a culture of mutual trust, confidence and learning, where staff is encouraged to contribute to the development of safety while confidentiality is guaranteed.”
- › Safety Management System is the foundation of a sound safe railway operation and safety framework
- › Safety culture drives the best safety management systems

What should be considered within a Safety Management?

Basic elements of the safety management system

The basic elements of the safety management system are:

- (a) **a safety policy** approved by the organisation's chief executive & senior management and communicated to all staff;
- (b) **qualitative and quantitative targets** of the organisation for the maintenance and enhancement of safety, and plans and procedures for reaching these targets;
- (c) **procedures for safe operation** to meet existing, new and altered technical and operational standards or other prescriptive conditions throughout the lifecycle of equipment and operations
- (d) **procedures and methods for carrying out risk evaluation** and implementing risk control measures whenever a change of the operating conditions or new material imposes new risks on the infrastructure or on operations;
- (e) **provision for training of staff** and systems to ensure that the staff's competence is maintained and tasks carried out accordingly;
- (f) **arrangements for the provision of safety relevant information** within the organisation and, where appropriate, between organisations operating on the same infrastructure;
- (g) **procedures to ensure that accidents, incidents, near misses and other dangerous occurrences are reported**, investigated and analysed and that necessary preventive measures are taken;
- (h) **provision of plans for action and alerts and information in case of emergency**, agreed upon with the appropriate public authorities;
- (i) **provisions for recurrent internal auditing** of the safety management system.

Who is investigating accidents?

The Railway Undertakings (RU) or/and Infrastructure Managers (IM)

Judicial authorities

The National (Independent) Investigation Body (NIB)



Why an (independent) accident investigation body?



- The objective is **prevention of accidents and possible improvement of railway safety**
- The investigation body shall investigate serious accidents and might investigate in addition also those accidents and incidents which under slightly different conditions might have led to serious accidents.
- The investigation body shall, at its discretion, decide whether or not an investigation of such an accident or incident shall be undertaken. In its decision it shall take into account:
 - (a) the seriousness of the accident or incident
 - (b) whether it forms part of a series of accidents or incidents relevant to the system as a whole;
 - (c) its impact on railway safety
 - and
 - (d) requests from infrastructure manager, railway undertakings, safety authority

Investigation framework

The framework of the legal system, legal status of the investigation shall be defined that will enable the investigators-in-charge to carry out their task in the most efficient way and within the shortest time.

In accordance with the legislation, and where appropriate, in cooperation with the Authorities responsible for the judicial inquiry, the investigators shall, as soon as possible, be given:

- (a) access to the site of the accident or incident as well as to the rolling stock involved, the related infrastructure and traffic control and signalling installations
- (b) the right to an immediate listing of evidence and controlled removal of wreckage, Infrastructure installations or components for examination or analysis purposes
- (c) access to the and use of the contents of on-board recorders and equipment for recording of verbal messages and registration of the operation of the signalling and traffic control system
- (d) access to the results of examination of the bodies of victims
- (e) access to the results of examination of the train staff and other railway staff involved in the accident or incident
- (f) the opportunity to question the railway staff involved and other witnesses
- (g) access to any relevant information or records held by the infrastructure manager, the railway undertakings involved and the safety authority.

Independence of Accident Investigation Body

Good practise

For achieving independence in organisation, the NIBs have reported that following provisions have proved to be useful:

- establishment of the NIB as a separate, independent and permanent body, ideally outside of any ministry or railway administration
- sufficient resources including people, financial and premises
- the possibility to receive additional budget under special circumstances, e.g. of a major accident,
- comparably legal status of the safety investigation and the juridical investigation
- legal power for the NIB to access the accidents site without delay,
- legal power for the NIB to interview witnesses independently of any other interview,
- legal power to request all information considered as necessary by the NIB from all relevant bodies and organisations
 - during an investigation
 - before an investigation with the purpose to enable the NIB to decide whether or not to conduct an investigation
 - at any time e.g. to conduct studies or to support other NIBs
- legal provisions to enable efficient co-operation with other NIBs; including provisions to collect information from any body or organisation on request of another NIB

- legal protection of the NIB against the use of the findings of the investigation by juridical authorities
- provisions that the appointment, employment and reward of the staff of the NIB cannot be influenced by any organisation from which the NIB must be functionally independent.

Access to

- › accident site
- › rolling stock
- › the infrastructure
- › traffic control and signalling installations
- › content of record devices

Opportunity to question railway staff and witnesses

Investigation independently of juridical investigation



Evidences which may be collected

ANNEX I – CHECKLIST OF TECHNICAL ITEMS OF EVIDENCE WHICH MAY BE COLLECTED

The following checklist comprises items of evidence which may need to be collected following a railway occurrence. This list, based on {Ref. 7} is NOT an exhaustive list

- a) Human factors information
- b) Original copies of train documentation including, where appropriate:
 - i. Train brake certificate
 - ii. Train consist form
 - iii. Dangerous goods documentation
 - iv. Safeworking forms
- c) Train control, signaller, or driver voice recordings:
 - i. Hard copy printout
 - ii. Audio tape
- d) Locomotive or train recording equipment download and analysis:
 - i. Data logger memory module
 - ii. Speed recorder data
 - iii. Data logger or other data analysis report
- e) Track observations, measurements and tests:
 - i. Gauge
 - ii. Superelevation
 - iii. Line
 - iv. Top
 - v. Curvature
 - vi. Track alignment
 - vii. Depression tests
 - viii. Marks on rails and sleepers
 - ix. Rail profile
 - x. Rail fastenings
- f) Signal testing:
 - i. Signal function test
 - ii. Signal sighting test
 - iii. Locking test
 - iv. Aspect test
 - v. Data logging records
- g) Rolling stock measurement and testing:
 - i. Air brake testing
 - ii. Wheel profile measurement
 - iii. Twist testing of vehicles
 - iv. Vehicle weight measurement
 - v. Testing of bogies, damping, springs, and centre pivot point
 - vi. Sidebearer clearance measurement
 - vii. Braking distance testing
- h) Weather condition information:
 - i. Light conditions
 - ii. Rainfall and quantity
 - iii. Wind conditions
 - iv. Temperature
- i) Ultrasonic testing of metal components
 - i. Wheels
 - ii. Axles
 - iii. Bogies
 - iv. Underframes
- j) Geotechnical examinations:
 - i. Track formation
 - ii. Embankments
 - iii. Tunnels
 - iv. Bridges
- k) Environmental testing and measurement:
 - i. Soil
 - ii. Water
 - iii. Noise
 - iv. Vibration

Legal requirements - openness of the investigation

Keep the investigation transparently

Inform all parties regularly

Share the results

Let them submit their opinions and views

Let them comment on the information in draft reports

But: **don't share everything**



Legal requirements - final report and safety recommendations

- › Investigation must be finalised with a final report
- › NIB may issue safety recommendations
- › The addressee of a safety recommendation must report back to the NIB
 - › at least annually
 - › periodically



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