



EUROPEAN RAILWAY AGENCY

Safety Unit

Guidance for the establishment and work of the national investigation bodies

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N°	Description	Reference	Version
/1/	Directive 2004/49/EC of the European Parliament and of the Council on safety on the Community's railway and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying for the of railway infrastructure and safety certification (Railway Safety Directive)	Directive 2004/49/EC Railway Safety Directive	Corrigendum as amended by Directive 2008/57/EC, Directive 2008/110/EC Directive 2009/149/EC
/2/	Regulation (EC) No 881/2004 of the European Parliament and the Council establishing a European railway agency	Regulation (EC) No 881/2004	Corrigendum as amended by Regulation (EC) No 1335/2008
/3/	Guidance on good reporting practice	ERA/GUI/05/2010	Version 1.0 15 October 2010
/4/	Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community	Recast	
/5/	Communication Protocol between the European Railway Agency and the Competent National Authorities and Bodies relating to the communication of information as described in Regulation (EC) 881/2004 and Directives 96/48/EC, 2001/16/EC and 2004/49/EC	ERA-20070524	1.2
/6/	Implementation Guidance for CSIs, Annex 1 and Appendix to Directive 2004/49/EC	ERA_SU_GUID_CSIs	Final version 25 March 2010



/7/	Review of Accident Investigation Methodologies	ERA/2009/SAF/NP/02	1.0
/8/	Application guide for the design and implementation of a Railway Safety Management System	ERA/GUI/01-2011/SAF	Version 1 13.12.2010
/9/	Guidance on the decision to investigate accidents and incidents Articles 3(1), 19 and 21(6)	ERA/GUI/04/2010/SAF-EN	Version 1.0 14 March 2011
/10/	Guidance on safety recommendations in terms of Article 25 Directive 2004/49/EC	ERA/GUI/03/2010/SAF-EN	Version 2.0 30 April 2010

d) Specific terms and abbreviations

Term	Definition
Agency	the European Railway Agency

Abbreviation	Meaning
IM	Infrastructure Manager(s)
NIB	National Investigating Body (-ies)
NSA	National Safety Authority (-ies)
RSD	Railway Safety Directive
RU	Railway Undertaking(s)



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2 Introduction

2.1 Purpose

The Railway Safety Directive (RSD) /1/ sets out the principles for the safety investigation¹ of accidents and incidents in the EU railway system.

The Agency has prepared this guidance with the support of the NIB network. This guidance is intended to be a reference manual for accident investigating bodies. It is not intended as a substitute for legal text.

The guidance comprises good practice and proven experience amongst the NIBs. However it is intended the guidance could be adopted by each of the NIBs in a manner which the NIB sees best serves their purpose of improving safety of the railways in their member state; within the framework of the RSD and the national legislation.

2.2 Intended Use

The document is intended to be used as reference for managers and investigators of the national investigation bodies (NIBs).

However, it might be useful for other authorities, bodies and organisations who are dealing with safety investigations, e.g.

- Staff of national safety authorities (NSAs) which is concerned with reports and recommendations by NIBs
- Staff of other bodies which may be subject of safety recommendations by NIBs (e.g. emergency services)
- Railway undertakings (RUs), infrastructure managers (IMs) and other actors in the railway sector who are interested in the processes of accident investigation.
- Member states

2.3 Principles for this guidance

- The guidance should support the managers of the NIBs in organising the processes and the investigators in investigating.
- Guidance is given only to those provisions of the RSD dealing with the process and quality of the safety investigation itself, which should therefore be directly under control of the NIB.
- For those provisions of the RSD which usually were implemented by national legislation (e.g. legal framework for the work of the NIB), only examples for good practice are given.
- The guidance is assembled by using existing documents

2.4 Structure of this guidance

The guidance is structured as follows:

¹ However not defined explicitly, the term “Safety investigations“ is used within the recitals of the RSD. This term has been proven as successfully e.g. in the aviation sector e.g. to make a clear distinction to the juridical investigation. It describes the investigation of accidents and incidents in terms of the RSD.



Section 2	Gives an Introduction into this guidance
Section 3	Sets out the objectives of accident investigation
Section 4	Providing good practise on the establishment of the investigation body
Section 5	Provides guidance for the investigation process
Section 6	Explains other obligations of the investigation body
Annex	Provides definitions



3 Objectives of accident investigation

Reference to the RSD

- Recital 23

Serious accidents on the railways are rare. However, they can have disastrous consequences and raise concern among the public about the safety performance of the railway system. All such accidents should, therefore, be investigated from a safety perspective to avoid recurrence and the results of the investigations should be made public. Other accidents and incidents could be significant precursors to serious accidents and should also be subject to safety investigations, when it is necessary.

- Recital 25

The reports on investigations and any findings and recommendations provide crucial information for the further improvement of railway safety and should be made publicly available at Community level. ...

- Article 19 (1)

Member States shall ensure that an investigation is carried out by the investigating body referred to in Article 21 after serious accidents on the railway system, the objective of which is possible improvement of railway safety and the prevention of accidents.

Guidance

Recitals 23 and 25 and Article 19 very clearly state that the objective of the safety investigations conducted by accident investigation bodies is the prevention of accidents and further improvement of railway safety.



4 Establishment of the investigation body

4.1 The independence of a NIB

4.1.1 Independence in the organisation

Reference to the RSD

- Article 21.1
... This body shall be independent in its organisation, legal structure and decision-making from any infrastructure manager, railway undertaking, charging body, allocation body and notified body, and from any party whose interests could conflict with the tasks entrusted to the investigating body. It shall furthermore be functionally independent from the safety authority and from any regulator of railways.
- Article 21.2
The investigating body shall perform its tasks independently of the organisations referred to in paragraph 1 and shall be able to obtain sufficient resources to do so. Its investigators shall be afforded status giving them the necessary guarantees of independence.
- Article 20.1
Member States shall define, in the framework of their respective legal system, the legal status of the investigation that will enable the investigators-in-charge to carry out their task in the most efficient way and within the shortest time.

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.

4.1.2 Independence in decision making

Reference to the RSD

- Article 19.2

...

The investigating body shall, at its discretion, decide whether or not an investigation of such an accident or incident shall be undertaken....

- Article 19.3

The extent of investigations and the procedure to be followed in carrying out such investigations shall be determined by the investigating body

- Article 21.3

...The investigating body shall be able to ... make the necessary arrangements to start the investigation no later than one week after receipt of the report concerning the accident or incident.

Good practise

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

- full power for the NIB to decide on the opening of an investigation
- power for the NIB to
 - require other people or organisations to assist it in its investigations
 - direct others to carry out technical inspections, analyses or evaluations on its behalf.
 - freeze the site; this means that nobody is allowed to make any changes at the accident site, with exception of rescue services and the police.
 - direct others to collect evidence on its behalf
 - ensure that any external people providing assistance are independent and that there are no conflicts of interest
- sufficient resources

Shared experience

Some NIBs report on difficulties on the provisions of Article 21.3 because often a preliminary examination is necessary before taking the decision of officially open an investigation. This process of gathering information sometimes lasts more than one week.



4.1.3 Independence by technical expertise

Reference to the RSD

- Article 21.1

Each Member State shall ensure that investigations of accidents and incidents ... are conducted by a permanent body, which shall comprise at least one investigator able to perform the function of investigator-in-charge...

- Article 22.2

For each accident or incident the body responsible for the investigation shall arrange for the appropriate means, comprising the necessary operational and technical expertise to carry out the investigation. The expertise may be obtained from inside or outside the body, depending on the character of the accident or incident to be investigated.

Good practise

For achieving independence by technical expertise, it has proved to be useful to enable the NIB to recruit sufficient permanent and technically competent staff.

See also section 0.

4.1.4 Independence related to the juridical investigation

Reference to the RSD

- Article 19.4

The investigation shall in no case be concerned with apportioning blame or liability.

- Article 20.2

In accordance with the legislation in force in the Member States 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 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 examinations 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.



- Article 20.3

The investigation shall be accomplished independently of any judicial inquiry.

Good practice

According to the experience of the NIBs, legal provision or agreements (“Memorandum of understanding”) with the police, other juridical authorities or the responsible ministry enabling the NIB to perform its safety investigation completely independent from the judicial investigations has proved to be useful. This includes provisions

- on when the NIB’s investigation and when the juridical investigation will take precedence. Usually, the NIB has precedence for the investigation unless there is a clear indication that the accident was caused by terrorism, vandalism or similar activities. In any case the legal provisions or the agreements (“MOU”) should assist in the precedence being assigned to the party who might best serve the public interest.
- In all cases the ‘lead party’ must take into account the requirements of the other as far as this is possible
- In all cases where the other party has lead this does not prevent the other party from conducting an investigation
- on who may interview witnesses first,
- on how to avoid disputes between the parties and/or resolving any disputes that do arise.
- on how to share evidence, including a mechanism for sharing results of testing of evidence and prior consultation if the evidence is to be tested to destruction.
- which ensure that witness statements given to the NIB must not be shared with the judicial authorities.
- on whether and, if applicable, how the NIB’s investigators must give opinion or statements towards the court². In some Member States this obligation is limited to technical information but does not include the obligation to give opinion about the analysis.
- on whether and, if applicable how, the NIB’s investigation reports should be admissible in court; in some Member States it is not allowed at all, in other it is allowed only if it is favourable for defendants.
- which do neither authorise the judicial authorities to enforce any support by the NIB nor to seize material collected by the NIB.
- which do not allow any pressure on the conduction of the NIB’s safety investigation or its investigators.
- which ensure that the NIB’s reports can be written completely independent of investigations by any other party,

² The Agency has observed variety between the Member states whether the juridical investigation ends with the charge of the prosecutor or the court decision. Depending on the national legislation, this has to be taken into account when a NIB tries to establish agreements with the juridical authorities



4.2 Organisation of the NIB

4.2.1 Scope of the work

Reference to the RSD

- Article 21.1

Each Member State shall ensure that investigations of accidents and incidents ... are conducted by a permanent body, which shall comprise at least one investigator able to perform the function of investigator-in-charge in the event of an accident or incident. ...

- Article 21.4

The investigating body may combine its tasks under this Directive with the work of investigating occurrences other than railway accidents and incidents as long as such investigations do not endanger its independence.

Please note

The provision is formally addressed to the investigation body, but is linked to the national legislation. In contrast to Article 21.6, Article 21.4 refers to accidents and incidents others than occurrences in the railway system.

- Article 21.6

Member States may entrust the investigating body with the task of carrying out investigations of railway accidents and incidents other than those referred to in Article 19.

Please note

In contrast to Article 21.4, Article 21.6 refers to railway accidents and incidents.

Good practice

Several Member States have established the NIB as single modal body (only for accidents and incidents in the railway system), other Member States have chosen the multi-modal approach (one body for safety investigation in the railway sector, but also in other areas, e.g. aviation, the maritime sector or cable-cars).

Multi-modal bodies have proven to be effective and powerful because

- the factors which causes accidents and incidents are very similar in all industrial areas in particular related to human factors and the management of safety. For multi-modal bodies it might be easier to employ staff with specific background, e.g. on psychology and human factors.
- for multi-modal bodies it might be easier to be highly recognised by statutory authorities and the public.

Single modal investigation bodies, limited to the safety investigation within the railway system, have proven successfully e.g. because the lean hierarchy guarantees rapid contact with senior management and fast decision-making, e.g.



- on opening an investigation
- on the publication of the final report.

Experience shows that in both models it is possible and useful

- to communicate the lessons learnt from any accidents
- to share the equipment and the knowledge
- with the bodies/investigators responsible for the investigation in other industry areas.; this may help to improve safety also in other areas.

Good practise

In some Member States, the NIB is given explicitly the legal power or obligation e.g.

- to conduct studies into, monitor and analyse any matter it considers may be relevant to the effective investigation of accidents or incidents including
 - statistics and trends relating to the railway industry including those relating to accidents and incidents.
 - technological and other developments
 - the responses of those persons to whom the recommendations of the Branch are addressed;

In order to assist the NIB in carrying out these activities, the NIB may request assistance or information from

- the safety authority, any public body, an accident investigating body of another member State or the European Railway Agency; or
- any other person,
- to conduct an active exchange of information and views with the investigation bodies established in other member States under the RSD for the purpose of
 - developing common investigation methods;
 - drawing up common principles for the follow-up of safety recommendations; or
 - adapting to the development of technical and scientific progress.

Such legal provisions have proven as very useful for the NIBs and enable the NIB to

- collect information for the decision whether or not to open an investigation formally.
- Act on request of another NIB



4.2.2 Human resources

Reference to the RSD

- Article 21.1

Each Member State shall ensure that investigations of accidents and incidents ... are conducted by a permanent body, which shall comprise at least one investigator able to perform the function of investigator-in-charge...

- Article 22.2

For each accident or incident the body responsible for the investigation shall arrange for the appropriate means, comprising the necessary operational and technical expertise to carry out the investigation. The expertise may be obtained from inside or outside the body, depending on the character of the accident or incident to be investigated.

Good practice

For the determination of the number of employees the Member States are using criteria like

- The approach of the safety investigations

Taking into account that learning from minor accidents and incidents often is more efficient than from serious accidents, a number of Member States have chosen a pro-active approach. A pro-active approach in safety investigations by investigation also occurrences with minor consequences and precursors (e.g. SPADs) may help to reduce the number of accidents and incidents.

- the number of accidents and incidents

The number of occurrences is a very important criteria for the number of employees; the experience of the NIBs shows that a comprehensive investigation which also covers underlying and root causes requires appropriate human resources

- the number of trains running on the network
- the dimension of the railway network
- the accessibility of any location of the railway network for the investigators

Some Member States have defined objectives for the maximum time need between the notification of an occurrence and the arrival at the accident site, e.g. 2 – 3 hours.

Depending on the overall approach (local branches, internal or external staff) they have defined the number of employees taking into account the accessibility.

- the number of RU's and the amount of international railway transport on the national railway network

When setting up an investigation body, Member States have taken into account the number of RU's and the amount of international railway transport on the national railway network. This has influence on



- the probability for the need to deal with different actors; experience shows that this may lead to increased time and effort to conduct an investigation
- the probability for the need of co-operation with other NIBs; experience shows that this may lead to increased time and effort to conduct an investigation
- the necessity to re-open a line after an occurrence
- general tasks of the tasks of the NIB
The general tasks of a NIB (e.g. administration, cooperation with NIB network, reporting) should duly be taken into account when setting up a NIB.

4.2.3 Organisation of human resources

Good practice

When setting up its organisation, larger NIBs have reported on the following tasks taken by own permanent employees:

- Duty co-ordinator – on duty 24/7 - who has competency to decide whether to mobilise in real time and manage the site and co-ordinate other organisations in the early stages of the investigation
- Senior NIB point of contact 24/7 for duty co-ordinator for referring decisions as appropriate (also on call) and senior management of major investigations
- For response to large accidents – hierarchy of tactical and strategic command (this will be country specific and should be co-ordinated with the police and emergency services hierarchy of command)
- Access to media support 24/7
- Inspectors, on call, fit for duty, and will ready access to site response equipment and transport. Normally inspectors would not be mobilised on their own
- Branch subject specialists (or readily available approved contractors) who will assist in collecting evidence, analysis and/or peer review
- Investigation managers – formal peer review (part of quality arrangements)
- Chief inspector who is responsible for decisions of which incidents/accidents to undertake, investigation review and approvals
- Investigation operations manager who will oversee resourcing matters
- Independent legal advice
- Administrative support including database management, reporting and publishing
- Person in charge of maintaining equipment (calibration etc)
- Person in charge for the co-operation within the network of NIBs and their task forces.

In smaller NIBs, these tasks are adapted according to the size and the needs of the NIB.

Special expert knowledge, e.g. on metallurgy, chemical analysis or human factors, is covered by internal staff only in some NIBs. For such issues, most NIBs involve external experts or laboratories where necessary.

Good practice

Several NIBs have implemented provisions (internal or external) for posttraumatic care for investigators after serious accidents.



4.2.4 Skills of the investigators

Reference to the RSD

Article 22.2

For each accident or incident the body responsible for the investigation shall arrange for the appropriate means, comprising the necessary operational and technical expertise to carry out the investigation. The expertise may be obtained from inside or outside the body, depending on the character of the accident or incident to be investigated.

Guidance

Any NIB should have a systematic approach for ensuring the competence of its staff, containing:

- the recruitment of staff, taking into account:
 - the knowledge, skills and aptitudes the person needs to do a specific job
 - which of the knowledge and skills can be trained and which the applicant will need to have
- the training of the staff the NIB as and when needed; accident investigator training courses are facilitated by the Agency and other organisations
- tracking the training and competence of staff as needed (to enable complementary training to be organised in good time depending on the tasks to be performed)
- Process for deploying suitably qualified and equipped team members to accident sites or to other locations in order to commence any investigation

4.2.5 Technical Equipment

Good practise

Most NIBs have proper equipment to go to any accident site and to perform the collection of facts, such as (list not exhaustive)

- suitable vehicle to proceed to any accident site (e.g. off-road car)
- communication devices (mobile phone, mobile internet)
- personal protective equipment
- local/route maps
- mobile computer
- camera
- voice recorder
- tools (equipment and software) for reading data recorder; NIBs have reported on support by manufacturers
- material sampling equipment
- secure containers/locations for perishable (non-metallic) evidence
- measuring equipment including gauges (rail profile measuring device)
- hardware and software for the reconstruction of the occurrence

Often, other investigating parties (e.g. the police) have special equipment which as far as possible should be shared, e.g. special photography measurement devices or measurement



equipment. From the NIBs' reported experience, it should be agreed in advance how the NIB could use such equipment.

4.2.6 Financial resources

Good practise

Most NIBs have a dedicated budget, which sufficiently takes into account the needs determined by

- The number of employees
- The number of investigations
- Need for external experts and laboratories
- Suitable located premises
- Equipment including maintenance
- All other tasks of the NIB

In addition, usually the NIB have a means of obtaining extra financial resources if they are needed to investigate a major accident.

4.2.7 Location

Good practise

For the decision on the location, the NIBs have considered following criteria:

- Access to the road network or, if applicable, to the location of the helicopter or other means of transport to any possible accident site ,
- Access to the main lines and the core areas of the rail network,
- Reachability of frequently contacted organisations, e.g.the ministry, the NSA and the railway industry,
- Attractive environment for gathering qualified staff.

4.3 Quality management

Good practise

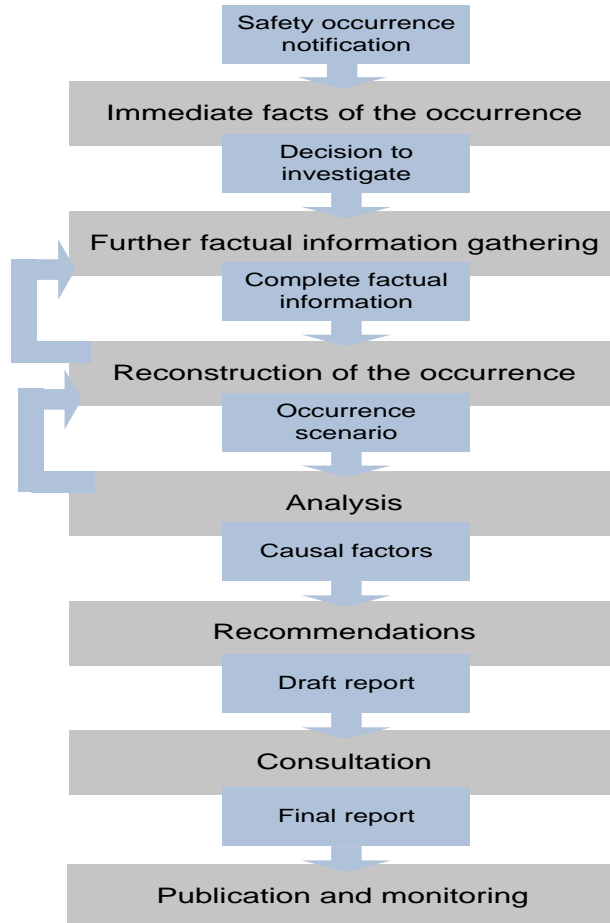
Most NIBs have implemented a quality management system to ensure the quality of the investigation and the final report. Key features are:

- Defined processes for
 - the planning of all phases of the investigation process
 - the allocation of the recourses directly after the decision to investigate.
- Defined processes for the
 - the preparation
 - the checks
 - the approvalof calculations, analysis, tests, reports (draft and post consultation)
- Guidance for the considerations that must take place for



- For the decision whether or not to investigate
- internal reviews
- Means to verify that
 - all analysis is based on evidence
 - all conclusions are based on analysis
- Constantly review whether the remit of the investigation is still fit for purpose as new information becomes available; should the remit be enlarged, further limited or change of direction,
 - costs, time and potential for safety learning
 - internal authorisation proceduresmust be considered.
- Periodic review of recommendations for learning as to which
 - did not get implemented
 - despite implementation ‘allows reoccurrence (why)
 - extent of material changes to report as result of consultation
- System to review procedures (on basis of experience) which control investigation, and assist the investigators
- Means of tracking/recording and proper handling of evidence (equipment and procedures)
- Competency management scheme
- Calibration and maintenance of equipment

5 The investigation process



5.1 Safety occurrence notification

Reference to the RSD

Article 21.3

Member States shall make provision that railway undertakings, infrastructure managers and, where appropriate, the safety authority, are obliged immediately to report accidents and incidents referred to in Article 19 to the investigating body. The investigating body shall be able to respond to such reports and make the necessary arrangements to start the investigation no later than one week after receipt of the report concerning the accident or incident.

Guidance

If not governed by the national legislation, any NIB should set up a process for receiving notifications of accidents and incidents and agree with the IMs and, if applicable, the RUs, the NSA and the police and the rescue services on the types of accidents and incidents that need to be reported immediately. In addition, there should be an agreement on occurrences which should be reported to the NIB but not necessarily immediately.

The channels and means for reporting should also be agreed upon.



The NIB should ensure permanent availability around the clock, see section 4.2.3.

Good practice

- In most Member States, there is implemented a structured reporting system with several levels, e.g. which occurrences must be reported immediately, which ones on daily basis etc. As the IMs usually become aware of any occurrence, it has proven to be sufficient to oblige the IMs to notify accidents and incidents. The IMs are also able to oblige the RUs using the IM's infrastructure to report any occurrence to the IM.
- Several NIBs have direct access to the IM's log file on accidents and incidents. This has proven very successfully.
- In some member states, the NIB is linked with the national emergency call system to receive all notifications on accidents on or close to any railway premises.
- Most NIBs have made provisions to ensure availability 24 hours each day.

5.2 Immediate facts of the occurrence

5.2.1 Examinations at the accident site

Reference to the RSD

- Article 20.2

In accordance with the legislation in force in the Member States 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 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 examinations 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.*

- Article 22.4

The investigating body shall conclude its examinations at the accident site in the shortest possible time in order to enable the infrastructure manager to restore the infrastructure and open it to rail transport services as soon as possible.



Guidance

Articles 20.2 and 22.4 clearly indicate that the investigation bodies are expected to perform investigations at the accident site. The NIB should have the resources and means to be able to get independent accident investigators to the accident site as soon as possible.

Any NIB should set up a process for collecting immediate facts after it has received the notification of an accident or incident. When the NIB has decided to go to the accident site, all relevant parties should be informed immediately, and action should be agreed upon with the relevant parties (e.g. safeguarding the accident site).

Following an accident with death or serious injury of a person the Agency suggests starting a preliminary examination³ for checking

- whether all railway subsystems were working correctly
- whether the safety measures were sufficient and performed correctly e.g. in cases of accidents in the context of maintenance or construction work,

This preliminary examination might not necessarily be performed by the NIB; the NIB may rely on information given by the police, the infrastructure manager and/or the railway undertaking but should try to verify the information as soon as possible.

When arriving at the accident site as first, the investigator must

- ensure that his/her safety is given (potential release of dangerous goods, risk of explosion or fire, risk of electric shock, risk caused by on-going rail operation)
- take care on injured persons as far as possible; usually this task will be limited to forward information to the rescue services.

At accidents sites there are often parallel investigations by the statutory bodies (including the police) and the NIB. Separate investigations by the RUs and the IM usually are performed also. To ensure that all the investigations are carried out efficiently, there needs to be effective liaison, communication and co-operation between all the investigatory bodies.

The following list shows the areas to be covered within this cooperation:

- a means of identifying and securing the accident site,
- a means of each investigating party informing the others of any action they have taken prior to the other's arrival,
- a mechanism for preserving evidence effectively and minimising the potential loss of evidence and technical information before the NIB investigators arrive,
- means of ensuring that access to the site of an accident or incident is controlled so that evidence is not to be lost or destroyed,
- criteria on "who is in charge" at the accident site. Usually, after the injured have been recovered and the site made safe the NIB takes charge of the accident site unless there is a clear indication that the accident was caused by a terrorism, vandalism or similar activities,
- a means for ensuring the NIB investigators access to the site without delay

³ The Agency is aware that some NIBs do not have the legal power to conduct such a preliminary examination before officially opening an investigation. However, such provisions have proven very usefully, see section 4.2.1



- a mechanism for agreeing the evidence collection strategy between the investigating parties,
- a mechanism for ensuring that any evidence gathered is properly preserved
- a means enabling the NIB to carry out its own separate interviews of witnesses even in the case of any detention by the police of an individual,
- consultation between investigating parties to confirm they have no further investigatory need for the accident site, or part of it, before it is handed back to the operator,
- a mechanism for agreeing the investigation priorities between the NIB and other investigators with respect to: witness interviews (sequence and access); evidence identification, evidence collection and testing; and the prioritising of areas of investigation,
- a mechanism for excluding witness statements and details taken by the NIB from being shared with any other investigating body.

The operational interests of the infrastructure manager and the railway undertakings and the railway users must be taken into account by the NIB

- when setting up the organisation (see also section 0) by enabling the investigators to start an investigation at the accident site as soon as possible after a notification,
- when deciding on the scope of the investigation of an accident or incident,
- when deciding on the priorities of the various investigation steps.

With all decisions, the NIB should find a balance between the public interest of performing a detailed investigation and the economic interests of the stakeholders.

However, the final decision of the NIB on the release of the accident site should be taken by the NIB; if applicable, in consultation with the juridical bodies.

Good practise

- NIBs have made provisions to ensure 24h-availability and have ensured fast accessibility at any location of the network by
 - the availability of a car ; off-roads vehicles have proven as very usefully
 - making provisions for the use of helicopters or blue light driving
 - establishing a dense network of local investigation branches or individuals working for the investigation body on occasional basis
- NIBs have implemented structured processes to collect immediate information.
- NIBs have prepared directories with contact information of infrastructure manager, the railway undertakings, the police, the state prosecutor and other regional authorities which might be involved.
- NIBs have prepared directories with technical information about infrastructure equipment and rolling stock
- In several Member States there are detailed legal provisions or written agreements, e.g. a “Memorandum of understanding” between the authorities dealing with the juridical investigation directly at the accident site and the investigation body, see section 4.1.4.
- Some NIB uses the term “preliminary examination” to describe the phase, when the investigation body is collecting the immediate facts of the occurrence but has not yet taken



the decision to investigate⁴. Although the RSD does not make this distinction, giving this activity a formal label contributes to a useful and clearer overview of the investigation process and procedures.

- Some NIBs regularly draft short internal notes recording the visit to the accident site, even when the NIB has decided not to investigate. This note may be used in the justification of the decision.

5.2.2 Informing other NIBs

Reference to the RSD

Article 21.5

Investigation bodies from another Member State shall be invited to participate in an investigation whenever a railway undertaking established and licensed in that Member State is involved in the accident or incident.

This paragraph shall not preclude Member States from agreeing that the relevant bodies should carry out investigations in cooperation in other circumstances

The NIB should have a process to ensure that other NIBs will be informed or consulted if a RU, a keeper, a ECM, manufacturer or another organisation from another Member State is involved in an accident.

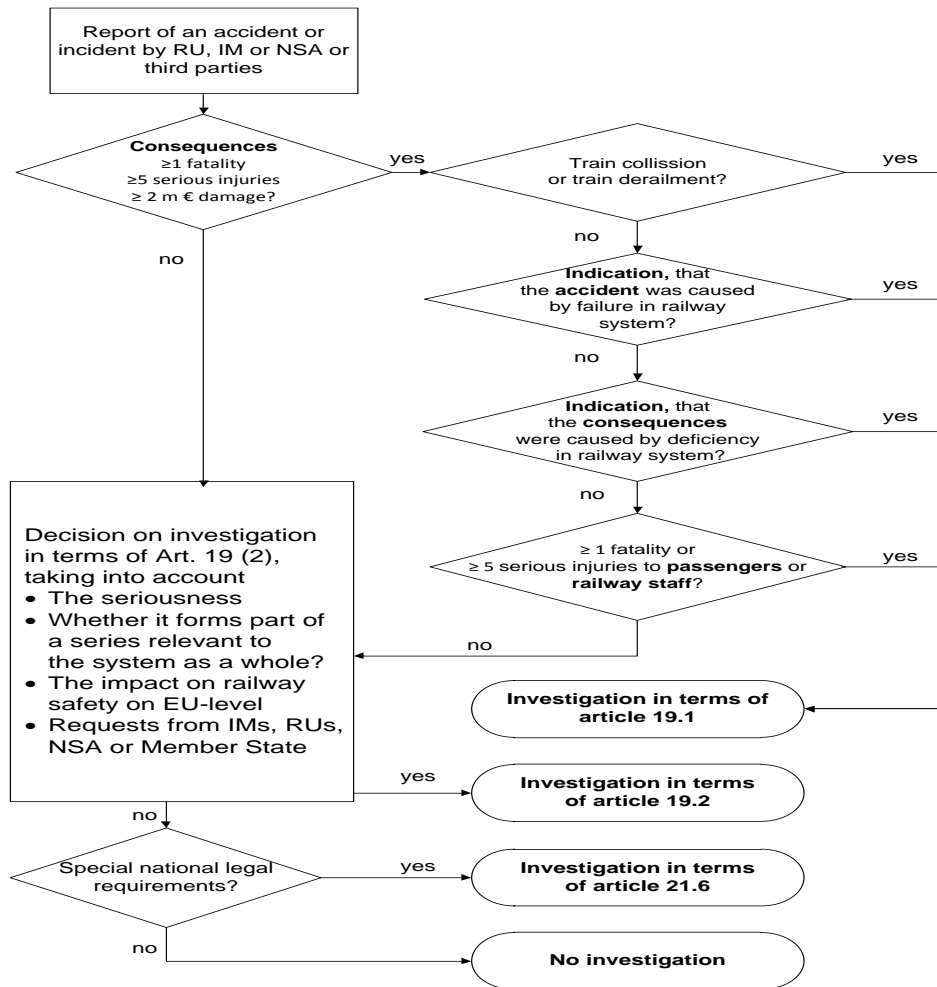
At this stage of the investigation process, this is only a matter of communication. The principles for cooperation between NIBs and the participation of another NIB during an investigation are set out in 5.3.2.

5.3 Decision to investigate

5.3.1 The decision whether or not to investigate

The NIB should have a process for the decision whether or not investigating an accident or an incident, taking into account the principles as agreed by the Network of NIB and published in the “Guidance on the decision to investigate” /9/.

⁴ The Agency is aware that some NIBs do not have the legal power to conduct such a preliminary examination before officially opening an investigation. However, such provisions have proven very usefully, see section 4.2.1



In the following section, these principles are set out more detailed.

5.3.1.1 Obligation to investigate

According to Article 19.1 serious accidents must be investigated. Serious accidents are

- Any train collision, which results in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment,
- Any derailment, which results in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment,
- Any level-crossing accident which results in the death of at least one person or serious injuries to five or more persons or extensive damage if the accident was a result of failures within the railway system (e.g. technical failures of infrastructure devices or rolling stock, staff not complying with the procedures, deficiencies in the safety management system etc.).
- Any accident to persons caused by rolling stock in motion which results in the death of at least one person or serious injuries to five or more persons or extensive damage, if the accident was the result of failures within the railway system (e.g. technical failures of infrastructure devices or rolling stock, staff not complying with the procedures, poor planning of maintenance work, etc.),



- Any fire in rolling stock when it results in the death of at least one person or serious injuries to five or more persons or extensive damage, if at least one of the criteria as follows is fulfilled
 - the fire was the result of failures within the railway system (e.g. technical failures of rolling stock, technical failure in infrastructure devices which led to a fire in rolling stock),
 - the consequences were a result of failures within the railway system (e.g. if passengers could not escape because of locked doors).
- Any other accident which results in the death of at least one person or serious injuries to five or more persons or extensive damage, if at least one of the criteria as follows is fulfilled
 - the occurrence was a result of failures within the railway system
 - the consequences occurred to passengers or staff

In cases of doubt, for the classification it might be useful to contact the Agency

5.3.1.2 Discretion for the NIB to decide whether or not to investigate

The Agency suggests the NIBs consider investigating all occurrences with an obvious potential for the consequences as defined in article 3 (l) e.g.:

- Accidents
 - train collisions,
 - train derailments,
 - level crossing accidents on level crossings with motorised road-traffic
 - people struck by rolling stock in motion, but not killed
 - fire in trains
- Incidents

The incident types, which have a clear potential to lead to serious accidents are:

- broken wheels
- broken axles
- wrong side signalling failures
- track buckles in areas with train operation
- broken rails in areas with train operation
- runaway of trains or wagons etc.
- track workers had to jump clear of rolling stock in motion

All other cases, when an accident or an incident did not lead to a serious accident according to the definition, simply because of random, favourable circumstances should also be considered for investigation.

The NIB has full discretion about the decision whether to investigate or not an accident or an incident except for serious accidents. According to the spirit of the RSD, the overriding reason for the NIB to investigate should be drawn from the expectation that safety lessons can be learnt by investigating an accident.



In article 19 (2) there are additional criteria for the decision to investigate:

- “the seriousness of the accident or incident”

For the public, the term “serious accident” is not directly linked with a specific definition. Even when there is initially no expectation that there will be safety lessons to be learnt, any accident with harmful consequences is likely to be of public interest. Public interest may be used as indicator for the seriousness of an accident in the public awareness and should always been taken into account when deciding whether or not starting an investigation.

- “whether it forms part of a series of accidents or incidents relevant to the system as a whole”

The NIB should always systematically search for similar accidents or incidents, by using e.g. national accident databases or the Agency’s database.

It is not sufficient to simply compare accident or incident types. To identify similarities, it is necessary to search for combinations of related incidents and accidents, e.g.

- “train derailment” ⇔ “broken wheel” or “broken rails”
- “train collision” ⇔ “SPAD”.

Furthermore there should also be other similarities in order to consider an accident or incident as “part of a series, e.g. related to:

- the location,
- the type of rolling stock involved or the infrastructure;

but also

- in the behaviour of the staff, e.g. actions related to an operating procedure
- in the underlying or the root causes of the occurrence

This series must bear an obvious risk potential for the safety of the railway system in its totality. The risk potential may arise from the probability of an occurrence and/or the potential consequences.

- “its impact on railway safety at Community level”

In cases of technical failures of the structural subsystems or of interoperability constituents the impact on railway safety at Community level should always be considered. The risk potential may arise from the probability of an occurrence and/or the potential consequences.

When similar accidents or incidents have also occurred in other member states, this may be another indication of “... impact on railway safety at Community level”.

- “requests from infrastructure managers, railway undertakings, the safety authority or Member States”

RUs and IMs are obliged within their safety management system to ensure that accidents and incidents are investigated. However, they may request an independent investigation by the NIB, in particular when they require an impartial examination of their SMS. Such



request should be considered by the NIB whether or not this is in line e.g. with the requirements on independence.

Requests by the safety authority are explicitly foreseen in the RSD. This includes requests by safety authorities of other member state transmitted via the NSA-network.

A request by the government, the Parliament or another constitutional or parliamentary institution the NIB's member state and – where transmitted through the usual protocols or procedures - of any other member state must be taken into account in the decision to investigate an occurrence or not.

5.3.2 The decision on the co-operation with or the participation of another NIB

Reference to the RSD

Article 22.1

An accident or incident referred to in Article 19 shall be investigated by the investigation body of the Member State in which it occurred. If it is not possible to establish in which Member State it occurred or if it occurred on or close to a border installation between two Member States the relevant bodies shall agree which one of them will carry out the investigation or shall agree to carry it out in cooperation. The other body shall in the first case be allowed to participate in the investigation and fully share its results.

Investigation bodies from another Member State shall be invited to participate in an investigation whenever a railway undertaking established and licensed in that Member State is involved in the accident or incident.

This paragraph shall not preclude Member States from agreeing that the relevant bodies should carry out investigations in cooperation in other circumstances

Guidance

Investigations into rail accidents and incidents are carried out normally by the NIB from the Member State within which the event occurred. However, in certain cases,

- two NIBs must agree how to conduct an investigation
- a NIB must invite another NIB to participate in an investigation

Two principal methods of involving other NIBs are foreseen in Article 22.1:

- Cooperation: both NIBs cooperate to carry out the investigation jointly.
- Participation: the relevant national NIB, which carries out the investigation, calls upon an NIB within another state to participate in the investigation;

The RSD authorises the Member States to agree on cooperation between the NIBs also in other circumstances.

The NIB should have a process for the cooperation with other NIBs and inviting other NIBs to participate in a investigation.

Where

- it is impossible to determine in which Member State the incident or accident occurred



- occurrence on a cross-border installation such as a tunnel or a bridge
- the initial action occurred in one member state, but the accident occurred in another one,
- a RU or a vehicle from another Member State is involved, or, an ECM
- a RU concerned, or the manufacturer of the rolling stock, or the ECM are established in another Member State,

the two NIBs concerned should liaise and agree upon how to conduct the investigation.

Where they decide on co-operation, they jointly should determine the scope and the methods of the investigation, and allocation of the tasks between both NIBs, e.g.

- on how, what and by whom information regarding the investigation should be shared with external parties
 - industry parties
 - authorities
 - bereaved
 - media
- on the need of an interim report
- on target timeframes and managers from both NIBs to jointly keep key milestones and scope of investigation under review to adjust resourcing and plans as necessary
- how NIB will be given legal authority to investigate in the other's country

The investigation should be carried out in an integrated way between the two NIBs, ideally with a view to drawing up a joint report. To respect special needs in the other Member States both NIBs should agree when making documents public or forwarding information to third parties, and particularly for the final report.

Principles of co-operation should be agreed in advance e.g. by way of memorandum of understanding.

Where they decide on participation the investigation is carried out by one NIB, but the other NIB participates in the investigation e.g. for research into elements, which can only be obtained in this Member State. This may concern

- the identification of the companies and parts concerned;
- the facilitation of making contacts, and acting as a contact person;
- the supply of technical or regulatory documentation

The participating NIB should

- be able to attend the meetings of the team of investigators
- regularly be informed of the progress of the investigation
- always be consulted on the final draft report, and have the possibility of making comments before its publication.

The RSD specifies that an invitation to participate is mandatory when the railway undertaking involved in an accident is established and licensed in another Member State.



Please note:

This obligation refers to the license but not to the safety certificate.

Good practise

Several NIBs have made agreements about cooperation and participation with other NIBs.

5.3.3 Communication on the decision

Reference to the RSD

Article 24.1

Within one week after the decision to open an investigation the investigating body shall inform the Agency thereof. The information shall indicate the date, time and place of the occurrence, as well as its type and its consequences as regards fatalities, injuries and material damage.

Guidance

The requirement refers to the decision to open an investigation, not to the date of the accident or incident.

The information shall indicate the date, time and place of the occurrence, as well as its type and consequences as regards fatalities, injuries and material damage.

The notification of accident information should be submitted to the Agency electronically either:

- by e-mail, to investigation@era.europa.eu (attaching the excel-file pro-forma (see annex 4.3.7 to the Communication Protocol) provided on the Agency's website) or
- online (filling in the electronic form on the Agency's website and saving it directly to the database server).

The description of the accident shall be provided in English.

Good practise

The majority of the NIBs use the online form for the notification of investigations. This facilitates the Agency to give immediate feedback in case of any question.

5.3.4 Decision to re-open an investigation

If an investigation is closed the NIB may decide to re-open the investigation on the same accident or incident in particular if new information or new technical evidence is available after the conclusion of the investigation.



5.4 Further factual information gathering

5.4.1 The decision on what extend to investigate

Reference to the RSD

Article 19.3

The extent of investigations and the procedure to be followed in carrying out such investigations shall be determined by the investigating body, taking into account the principles and the objectives of Articles 20 and 22 and depending on the lessons it expects to draw from the accident or incident for the improvement of safety.

Guidance

The NIB should have a process which facilitates the decision on the extent and the procedure of an investigation taking into account the principles as agreed by the network of NIBs and published in the “Guidance on the decision to investigate”/9/ and “Guidance on good reporting practice” /3/.

The NIB has a wide scope for the decision on the extent of the investigation.

After collecting the immediate facts of the occurrence it is within the discretion of an NIB to decide about the extent of an investigation. So the investigation body can decide to:

- focus on special areas within an investigation
- investigate or not beyond the level of direct causes

The NIB should keep in mind when deciding on the extent of the investigation:

- the lessons it expects to draw from the accident or incident for the improvement of safety
- the principles and objectives of articles 20 and 22
- the definition of “investigation” in article 3 n)
- the content of Annex V of Directive 2004/49/EC

5.4.2 Which information to be gathered?

Guidance

After the decision on the extent and the procedures of the investigation, information gathering should be planned carefully. Different methods and tools may help the NIB in this planning. More information could be found in the document “Review of Accident Investigation Methodologies” /7/

This phase of the investigation should aim in completely understanding what happened, when and where it happened and who was involved.

The purpose of this chapter is to give an indication of the minimum set of factual information that should be available, because it is considered essential for the development of the analysis, conclusions and, where appropriate, safety recommendations. This sequence should begin as far back in time as is necessary to include the significant events which preceded the accident.



- testimonies

The objective of an interview procedure should be to obtain information and further understanding of the occurrence and the organisational factors that shaped it, which cannot be revealed by examination of the site, the available technical data or documents by themselves.

In view of the importance of investigating not only direct and immediate causes and contributory factors of an occurrence but also the underlying and root causes, all persons involved in the occurrence - in every sense possible- could be the subject of an interview.

- The safety management system

The investigation should identify any organisation and its (safety) management, whose activities or (deficiencies in the) organisational structure and functions may have directly or indirectly influenced the separate events in the accident mechanism. Details of the requirements on the safety management system could be found in Annex III of the RSD /1/, in the Application guide for design and implementation of a Railway Safety Management System /8/ and the Guidance on good reporting practise /3/.

- Rules and regulations

The investigation should identify the relevant Community and national rules and regulations to explain the role and responsibilities of the different parties involved (e.g. NSA, IM and RU, ECM, manufacturers) and the way they should interact..

The other rules to be under investigation should be representative of the way the safety of operations is organised within the relevant organisation, from the personnel performing safety critical tasks, supervisor and line management, all the way up to the top management, with a sidestep to the designer. This is nothing else than the actual roll out of a company's "safety management system" or, in other words, the way safety is integrated in a company's operational processes.

- Functioning of rolling stock and technical installations

It is important to include all pertinent material failures and component malfunctions in an investigation, and to indicate whether they occurred prior to or at the occurrence. It is essential that failed or malfunctioning components which are deemed to be significant to the accident or which required examination or analysis be described.

- Documentation on the operating system

This part should investigate in detail the way the railway system was operated before, during and immediate after the occurrence.

The sequence under investigation should begin as far back in time as is necessary to include the significant events which preceded the accident.

- Man-machine-organisation interface



It is commonly accepted that all actions take place in a context, and that this context can be described as a combination of individual, technological and organisational components.

The aim of this item is to guide the investigator into gathering data on factors that affect the performance and the interaction of these components.

The following factors could systematically be considered and taken into account in the investigation:

- **Training/Experience:** The level and quality of training, together with the operational experience, determines how well prepared people are for the task at hand or for the situation.
- **Procedures:** The quality, accuracy, relevance, availability and workability of all written or electronic data for the task under consideration. (This does not include verbal instructions from supervisors, shift handover logs etc., which are considered to be Communication.)
- **Technical Availability:** Missing or inappropriate maintenance, inspections and/or readiness checks can impact the availability or performance of equipment/tools/functions.
- **Design:** The equipment, displays and controls, layout, quality, and quantity of information available from instrumentation/interfaces, and the interaction of the operator/crew with the equipment to carry out tasks. The in-/adequacy of computer software is also included in this factor as well as the impact of design on the reliability, availability, safety and maintainability of technological/organisational components.
- **Communication:** The exchange of information (written, verbal, or non-verbal) among the operators or between operators and sources outside. (Information gathering from the interface is not considered as communication, but should rather be classified under the factor Design).
- **Ambient Conditions:** The physical, environmental conditions that have a significant impact on the performance of the system components, like temperature, sound, illumination, weather conditions ...
- **Person Related Conditions:** The temporary or permanent characteristics of an individual that determine whether or not he is physically and mentally fit to perform the task at the required time.
- **Working conditions:** The psychological working conditions, including the social environment, that have a significant impact on performance.
- **Supervision:** The planning, prioritising and organising of job tasks can affect individual and crew performance. This includes consideration of coordination, command and control.

Please note

All information and evidence must be documented accurately.



5.4.3 The allocation of resources

Reference to the RSD

Article 22.2

For each accident or incident the body responsible for the investigation shall arrange for the appropriate means, comprising the necessary operational and technical expertise to carry out the investigation. The expertise may be obtained from inside or outside the body, depending on the character of the accident or incident to be investigated.

A key role for the NIB's management is – within the budgetary allocation - ensuring the necessary resources are made available for each investigation step as shown, an important part of which is the competence of all those involved in providing detail and expert opinion to assist with investigations and the wider aspects of accident management.

For the investigation, the NIB needs technical and operational expertise related to the accident type such as (list not exhaustive)

- technical experts for infrastructure equipment, rolling stock, signalling and operation,
- experts in conducting interviews,
- human factor expertise,
- expertise in safety management and organisational issues

If not applicable within the NIB's organisation, the NIBs must ensure that this expertise is available without delay or any other negative impact to the investigation. It is important that the NIB has clear and transparent methods of quickly obtaining the resources and technical experts.

These experts need to:

- have prior knowledge and familiarity with the role and procedures of the NIB;
- have no conflicting interests;
- be able to get to join the investigation, if applicable also at the accident site, quickly to start an independent investigation.

When involving external experts, the NIB should ensure that for the expert the same rules on confidentiality applies as for the NIB.

5.4.4 Assistance of other NIBs or the Agency

Reference to the RSD

Article 21.5

If necessary the investigating body may request the assistance of investigating bodies from other Member States or from the Agency to supply expertise or to carry out technical inspections, analyses or evaluations.



5.4.4.1 Assistance of other NIBs

Guidance

In this investigation phase, NIB's assistance should be considered for example when

- an accident or incident occurs close to the border of another Member State. If available, the neighbouring NIB may be asked for assistance e.g. in the collection of evidence at the accident site; such assistance must be in line with the national legislation.
- rolling stock, involved in an accident or incident, might have continued the trip to another member state
- railway undertaking concerned, or the manufacturer of the rolling stock or infrastructure devices, or organisations holding information useful to the investigation, are established in another Member State.

As far as possible, the assistance of another NIB, should be subject of a previous agreement, e.g. by way of a memorandum of understanding (MoU).

Please note

Assistance differs from co-operation and participation; these principles are set out in 5.3.2.

5.4.4.2 Assistance of the Agency

In this investigation phase, the Agency's assistance should be considered for example when specific information is necessary on European level. The Agency also may help with providing contact to the NSA network.

As the Agency might have been involved e.g. by setting technical requirements, potential conflict of interest should be considered.

5.5 Reconstruction of the occurrence

5.5.1 To understand what happened

The reconstruction of an occurrence is a transition phase between the immediate reporting of an occurrence and the subsequent analysis that identifies the causal factors, which lead to the occurrence.

The purpose of this step is to describe how the occurrence happened.

The output should be a description of the events, adequately supported by evidence, which clearly explains the sequence and relationship between events that led up to the occurrences and effectively the outcome.

There are different tools and techniques to manage the reconstruction of the occurrence e.g. mapping, simulation and/or visualisation.

Details may be found in /8/.



Good practise

In most cases it has proven as successfully to map the chain of events, starting from the moment of the occurrence, and

- by looking back into the past, to create a solid basis for the following analysis;
- by looking forward from the moment of the occurrence, to create a solid basis for the analysis of the consequences (e.g. communication after the occurrence, actions of the rescue service etc.)

It is important that the performance of all subsystems and involved staff is recorded and mapped accurately. Experience shows that there might be the risk that when collecting data, investigators may focus in one direction, driven by their experience and instinctively starting with the analysis.

When mapping the performance of all subsystems and involved persons, it appears that the information has to be synchronised as the data recorder of the different subsystems (incl. the logbooks e.g. on mechanical interlocking systems) may use different time reference.

Most NIBs arrange team meetings at the end of this investigation phase with the objective to agree on what happened.

5.5.2 Communication of what happened

Reference to the RSD

Article 22.3

The investigation shall be carried out with as much openness as possible, so that all parties can be heard and can share the results. The relevant infrastructure manager and railway undertakings, the safety authority, victims and their relatives, owners of damaged property, manufacturers, the emergency services involved and representatives of staff and users shall be regularly informed of the investigation and its progress and, as far as practicable, shall be given an opportunity to submit their opinions and views to the investigation...

Guidance

The NIB should have a process to communicate in a structured way with other parties who are investigating the occurrence. There should be communication between all parties who investigate on this accident. As far as possible, all relevant parties involved in the occurrence should agree on what happened.

For details, see also section 5.6.4

Good practice

NIBs perform regular meetings with the stakeholders and share their technical evidence and results with others.



5.6 Analysis

In this phase, the aim is to analyse and explain all the reasons why the occurrence took place in the way that it did, starting from the assumed occurrence scenario –based on the evidence known at that moment.

This process may identify the need for further factual information gathering. The exact nature of this overall iterative process is generally determined by both the available resources and the opportunity to improve safety in an organisational way.

For further details, see also section 5.7.

Different methods, tools and technologies may support the NIB in the analysis of an accident or incidents /7/

Please note

All information and evidence must be challenged.

5.6.1 Technical analysis

With reference to the chain of events, all data and information collected about the performance of the subsystems should be systematically analysed for any deviations from the expected performance.

The next steps will depend on the deviation detected (if any). The NIB may decide at their discretion, whether or not to look deeper into single observations, depending on their expectations that the results may lead to improvements in safety.

Very often, external expert knowledge is necessary, e.g. to analyse why a wheel has broken (e.g. design, material defect, fatigue). As some tests may imply the destruction of the evidence, agreements with other investigating parties will be necessary.

5.6.2 Analysis of human performance

The most important principle to follow when trying to understand the behaviour of the main human actor involved in the occurrence is always to view the unfolding of events from his/her perspective. This approach takes not only the chronological course of events into consideration, but also means restricting the analysis to the information available and to this person at each specific step towards the point in time when the accident/incident has happened. In particular, any unusual events, such as when a train driver has passed a signal at danger or some form of degraded operation prior to the incident/accident will inevitably affect his/her subsequent actions.

It is not easy to keep to this approach, hindsight will always influence how you analyse the situation leading up to the incident/accident.

In addition, it is essential to understand the wider aspects of the actor's task that may have influenced his/her behaviour. Most important of these is the issue – or even pressure - of getting



the task done on time (for the train driver, reaching the next station on time; for the signaller, ensuring an efficient flow of traffic). Then there are more personal issues; the person involved in the occurrence may have recently experienced performance-related issues (negative supervisor's report, unsuccessful, refresher training) as well difficulties in private life or medical problems.

A frequent observation from the analysis of human performance is that the actor has not followed the relevant procedures. It is very seldom the case that this is a voluntary rule violation. To reach a good understanding as to why a procedure has not been followed, many question that need to be examined, for example:

- Is the procedure easy to use, does it require more time than is available to follow correctly
- Were there conditions at the time that made it more difficult to follow the procedure
- Is the procedure usually followed correctly by most staff
- Was the procedure developed with staff participation?

Finally, please remember you will not be able to fully explain the behaviour of another person. Even when the person concerned can or is willing to explain their own behaviour, there will be some aspects that will remain unclear. After all, you will have experienced situations when you do not know why you have done something in a particular way.

It is therefore very important to document the process of analysis and to describe clearly the basis for your conclusions.

5.6.3 Assistance of other NIBs or the Agency

Reference to the RSD

Article 21.5

If necessary the investigating body may request the assistance of investigating bodies from other Member States or from the Agency to supply expertise or to carry out technical inspections, analyses or evaluations.

Guidance

The NIB should have a process for collaborating with and getting help from other bodies such as other NIBs, and the European Railway Agency.

5.6.3.1 Assistance of other NIBs

In this investigation phase, NIB's assistance should be considered for example when

- one NIB has a special laboratory for conduction technical analyses.
- the manufacturer of the rolling stock or infrastructure devices, or organisations holding information useful to the investigation, are established in another Member State.

As far as possible, the assistance of another NIB, should be subject of a previous agreement, e.g. by way of a memorandum of understanding (MoU).



Please note

The principles for cooperation between NIBs and the participation of another NIB are set out in 5.3.2.

5.6.3.2 Assistance of the Agency

The Agency's assistance should be considered for example when

- experts on special fields are needed
- a NIB needs an impartial assessment on the conduct of an investigation.

As the Agency might have been involved e.g. by setting technical requirements, potential conflict of interest should be considered.

5.6.4 Communication

Reference to the RSD

Article 22.3

The investigation shall be carried out with as much openness as possible, so that all parties can be heard and can share the results. The relevant infrastructure manager and railway undertakings, the safety authority, victims and their relatives, owners of damaged property, manufacturers, the emergency services involved and representatives of staff and users shall be regularly informed of the investigation and its progress and, as far as practicable, shall be given an opportunity to submit their opinions and views to the investigation...

Guidance

It is within the remit of the NSA, the RUs, the IMs and other bodies and organisations to take measures according to the allocation of responsibilities as set out in the RSD. For that reason, all relevant parties must be informed regularly in particular in cases of safety-relevant findings which might require immediate reaction.

Openness can take place during the different phases of the investigation. Studies demonstrate that openness in the accident investigation process leads also to support for the results of the investigation and recommendations.

However, when applying the principle on openness, the NIB may not negotiate or discuss with the organisations about their interests; this could damage the independence of the NIB.

In any case, the NIB has the final decision on sharing of evidence or information in particular if the NIB believes that sharing would damage an on-going investigation.

Safety-critical findings which may have impact on other railway sector organisations in the EU, should be reported to the Agency's safety information system (SIS). This enables an exchange of information between the NIBs and the NSAs.



Good practise

The NIBs have implemented processes to enable the organisations to learn during the NIB's investigation and have the opportunity to take effective measures also at a short notice. The Agency has observed some variety between the member states on how the principle on openness is applied:

- In some member states, the preliminary investigation findings, draft conclusions and draft recommendations are shared with the organisations by means of dialogue and interaction which, for example, take the form of interviews, discussions, regular meetings, workshops and seminars.
- In other member states, the NIB informs the stakeholders only on important safety-critical findings during the investigation process.

5.7 Causal factors

5.7.1 Causal factors which led to the accident or incident

The RSD (Art 3 (o)) defines 'causes' as actions, omission, events or conditions, or a combination thereof, which led to the accident or incident. If eliminated or avoided, these causes would have mitigated the resulting injuries or damage.

Annex V of the RSD distinguishes between

- 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.

The determination of the causes should be based on a thorough, impartial and objective analysis of all the available evidence. No new information should be introduced in the causes. Any condition, act or circumstance that was a causal factor in the accident should however be clearly identified.

Significant events and factors that were investigated in detail, but eliminated as possible causes in the analysis, should also be stated in the investigation report, just as areas of ambiguity. When there is insufficient evidence to establish why an accident occurred, there should be no hesitation in stating that causes remain undetermined.

5.7.2 Causal factors which had impact on the consequences of the occurrence

The principles as set out under 5.7.1 are applicable also for the determination of causal factors which led to the consequences of an accident. This might be causal factors e.g. related to

- The design of the infrastructure or the rolling stock, e.g. the availability of the emergency exits in a train
- The performance of the rescue services
- The performance of the RU'S and IM's emergency plan



5.7.3 Additional observations

During railway accident investigations, safety issues are often identified which did not contribute to the investigated occurrence but which nevertheless, are safety deficiencies. These safety deficiencies should be recorded and reported in the accident investigation report.

5.8 Recommendations

5.8.1 When to issue a recommendation

Reference to the RSD

Article 23.1

An investigation of an accident or incident referred to in Article 19 shall be the subject of reports in a form appropriate to the type and seriousness of the accident or incident and the relevance of the investigation findings. The reports shall state the objectives of the investigations as referred to in Article 19(1) and contain, where appropriate, safety recommendations.

Guidance

Investigation reports contain safety recommendations, where appropriate. This means that not every report must contain safety recommendations.

A safety recommendation is a key instrument investigation bodies have. This instrument should be used regularly but not excessively.

The aim of a safety recommendation is to improve the safety both at a national and an European level. Considering that

- all actors in the railway sector have their own generic safety responsibilities,
- measures already taken would normally be reported in the investigation report (Annex V),
- an investigation shall be carried out with as much openness as possible (Article 22 (3))

mostly the key findings are well-known by the parties involved before the investigation report is published. Hence, in many cases the responsible actor may have already reacted appropriately and in consultation with the NSA and the NIB before the investigation is finished, and supporting evidence of implementation is available.

The different stakeholders may not wait for a recommendation before taking action to improve safety following an accident or incident.

Even if it is not the task of the NIB to evaluate which other actors might be affected by the same safety issue that has been identified, the NIBs should always be aware that the facts and findings of a current investigation may have a wider range of impact. So a safety recommendation is necessary if there is indication that another RU, IM, manufacturer, holder or any other actor in the railway sector might be affected by the same issues raised through the investigation.



A safety recommendation may not be necessary if

- the circle of potentially affected actors also is known and has been informed
- the recommendation would be solely concerned with compliance with existing rules and standards.

5.8.2 To address a recommendation

Reference to the RSD

Article 25.2

Recommendations shall be addressed to the safety authority and, where needed by reason of the character of the recommendation, to other bodies or authorities in the Member State or to other Member States. Member States and their safety authorities shall take the necessary measures to ensure that the safety recommendations issued by the investigating bodies are duly taken into consideration, and, where appropriate, acted upon

Guidance

Details are available in the Guidance on safety recommendations”/10/.

There are only three addressees of a safety recommendation foreseen in Article 25.2:

- The safety authority
- Other bodies or authorities in the Member State
- Other Member States

Please note:

- Addressee is the authority or body under whose authority the implementation of a safety recommendation lies.
- Addressees other than the Safety Authority should be an exception.
- “other bodies or authorities” refer to public bodies and doesn’t include organisations under the authority of the NSA such as RU’s, IM’s, manufacturer, owner or other actors in the railway sector.
- Addressing a recommendation to a NSA doesn’t mean that RU’s, IM’s and other parties are released from their responsibility for safety operation.

5.8.2.1 Addressing a safety recommendation to the NSA

As only the NSA has

- all the necessary information to check whether the recommendation might affect a wider range of RUs, IMs or other parties in the national railway sector,
- the power to oversee measures within the scope of its authority in the national railway sector,
- the power to enforce measures, if the actors don’t react appropriately according to their responsibilities,
- the power to withdraw a safety authorisation or a safety certificate as an ultimate measure,
- the power to promote and, where appropriate, enforce and develop the safety regulatory framework (Article 16 f)),

the NSA is the most common addressee of a safety recommendation.



5.8.2.2 Addressing a safety recommendation to other bodies or authorities in the Member State

Where an addressee would not fall within the scope of the actors that are under the umbrella of the NSA, the NIB may address recommendations directly to other bodies or authorities in the Member States, usually outside of the railway sector, which have the power to enforce the recommended measures, e.g. emergency services, road authorities etc.

5.8.2.3 Addressing a safety recommendation to other Member States

Where an addressee would fall within the scope of another Member State the NIB may address recommendations directly to another Member State.

Usually, according to national legislation a recommendation to another Member State must be disseminated via the government of the Member State. The NIB has to check the correct format applicable in its Member States.

In addition there are two options for informing the NSA of another Member State more directly:

- If the investigation identifies issues in other Member States, or there are vehicles, staff or anything else from another Member State that has a role in the accident, the competent NIB may invite the other NIB to carry out the investigation in cooperation (Article 22 (1)). In this case the safety recommendation can be drafted by both NIB's together, and both NIB's can send it to the addressee in its own country.
- If the investigation identifies issues in other Member States, or there are vehicles, staff or anything else from another Member State that has a role in the accident, the competent NIB could address a recommendation to the NSA to inform the NSA(s) of (an)other Member State(s) via the NSA-network about the accident, the results of the investigation, the measures taken and the recommendations given by NIB. It is the responsibility of the NSA of the other Member State, to consider the appropriate measures in its own Member State.

5.8.3 To avoid when issuing recommendations

Reference to the RSD

Article 25.1

A safety recommendation issued by an investigating body shall in no case create a presumption of blame or liability for an accident or incident.

Guidance

The NIB should have arrangements to ensure that its safety recommendations do not create a presumption of blame or liability for an accident or incident. When drafting a safety recommendation use as neutral as possible formulations. Where possible avoid judgemental phrases such as "mistake", "lack", etc.

Good practise

Some NIBs perform special checks to ensure that the wording of the recommendation complies with the requirement of non-blaming, e.g. by involving a legal adviser or a quality manager.



5.8.4 To draft a recommendation

Guidance

- Most recommendations fall into one of three categories
 - recommendations aimed at the causes of an accident or incident,
 - recommendations aimed at the consequences of an accident or incident
 - recommendations aimed at other observations during an investigation of an accident or incident.
- Any recommended measures must directly be derived from the identified findings.
- For clarity, each recommendation should only address one issue.
- If there is more than one recommendation in a report it is useful to number them and group them e.g. according to the addressee (in most cases the NSA).
- A recommendation should be drafted succinctly, avoiding the use of unnecessary or ambiguous words.
- The wording should be such that there is clarity regarding what action/change is required. The addressee must clearly understand which action the NIB recommends.
- The wording of a recommendation should facilitate clear assessment whether the recommended measure is implemented entirely, partly or not at all.
- There should be normally no prioritisation between the issued recommendations. However, if necessary from the viewpoint of the NIB, the urgency of a recommended action may be highlighted.
- Usually a Safety Recommendation should guide the affected parties on what safety objective is to be achieved rather than give prescriptive solutions.

Good practise

Most recommendations in the Agency's database contains the elements as follows

- **Headline and/or number**
- **Introduction**

Some NIBs give a short introduction to a safety recommendation e.g. by giving the link to the identified cause. Such an introduction may support the understanding in particular of those readers (e.g. NIBs from other member states) who may search for recommendations.

- **The organisation which issues the recommendation**

Some NIBs always mention expressly the issuer of a recommendation in each single recommendation. This practice may also support the understanding of a safety recommendation.

- **The addressee of the recommendation**

The Agency suggests mentioning the addressee clearly in the recommendation.

- **The recommended measure**

The recommended measure contains information about

- The action required by the addressee
- The organisation to whom the recommendation is directed



- The organisation or body to whom the recommendation is directed is the “end implementer” of a recommendation. This organisation or body should be stated clearly in each recommendation.
- The action has to be taken by the organisation to whom a recommendation is directed
- The action which has to be taken by the “end-implementer” is the core part of a recommendation. This action must be stated clearly in a safety recommendation.
- Organisation or type of organisation to whom a recommendation is directed
Within the recommendation usually the NIB indicates the organisation (or organisation type) to which the recommendation is directed.

5.9 Draft report

Reference to the RSD

- Article 23.1

An investigation of an accident or incident referred to in Article 19 shall be the subject of reports in a form appropriate to the type and seriousness of the accident or incident and the relevance of the investigation findings. The reports shall state the objectives of the investigations as referred to in Article 19(1) and contain, where appropriate, safety recommendations.

- Article 23.2

“... The report shall, as close as possible, follow the reporting structure laid down in Annex V. The report, including the safety recommendation, shall be communicated to the relevant parties referred to in Article 22 (3) and to bodies and parties concerned in other Member States.”

Guidance

When drafting the investigation report, the NIB may take into account

- the type
- the seriousness and
- the relevance of the investigation finding.

This provision may help avoiding unnecessary effort. However, the structure of Annex V should be followed.

The report should always state the objective of the investigation (“... possible improvement of railway safety and the prevention of accidents”) and the restraint of the investigation (“The investigation shall in no case be concerned with apportioning blame or liability”)

The quality of the investigation reports is a key issue for the reputation of a NIB. Within its quality management, the NIB should have a structured process to ensure good report quality.



The draft report should internally be reviewed against the defined scope of the investigation. Investigators can benefit from constructive feedback on draft reports and records of these can be a useful element of the competence system.

For further details, see “Guidance on good reporting practise /3/

Good practise

To ensure good report quality, some NIBs performs cross-checks with other investigators, not involved in the investigations, or brainstorming sessions with the whole investigation team.

Some NIBs have implemented processes to ensure the quality of the report, e.g. by

- Using templates for consistency
- A process for structured review of the analysis before writing the report; the structure of the review exactly follows the structure of the template.
- Using journalism writing techniques, e.g. “inverted pyramid style”; such techniques may differ between the Member States.

5.10 Consultation

Reference to the RSD

Article 22.3

... The relevant infrastructure manager and railway undertakings, the safety authority, victims and their relatives, owners of damaged property, manufacturers, the emergency services involved and representatives of staff and users shall ... be allowed to comment on the information in draft reports.

Guidance

Prior to publication of a final investigation report, all the parties should be given an opportunity to review the report and make comments.

During consultation of the draft report the persons consulted should be reminded that the fundamental purpose of the report is to identify and report on the cause of the accident with the aim of improving railway safety without apportioning blame or liability. They also need to be reminded that the draft report is being sent to them in confidence. The NIB needs to consider what sanctions can be invoked if someone leaks information prematurely.

Any suggestions and comments made by the parties consulted should be restricted to the factual content and/or the analysis and the accuracy of the draft, which should then be considered by the NIB before publication of the final report. Ultimately, there should be no surprises to those affected by the contents of the report when the media follow up any of the published details.

Good practise

There is broad variety amongst the Member States in the application of this provision:



- In most Member states, the relevant IMs and RUs, the safety authority, the victims and their relatives, owners of damaged property, manufacturers, the emergency services involved and representatives of staff and users have the opportunity to submit their opinions and comments on the information in draft NIB investigation reports in a structured way.
- Depending on the type and complexity of an accident and the number of involved persons, some NIBs conduct information dedicated sessions for special person groups, e.g. for the victims and their relatives.
- NIBs have implemented processes for dealing with comments made on its reports; some NIBs mention the comments of the stakeholders and the NIB's decision how to deal with them in the final report.

5.11 Final report

Reference to the RSD

Article 23.2

“... The report shall, as close as possible, follow the reporting structure laid down in Annex V. The report, including the safety recommendation, shall be communicated to the relevant parties referred to in Article 22 (3) and to bodies and parties concerned in other Member States.”

Guidance

- The structure of the report must respect the reporting structure as laid down in Annex V “as close as possible”. Therefore the NIB should deviate from the structure only in reasoned cases. This does not mean that any single item listed in Annex V must be mentioned, if not applicable in the investigated occurrence, but the general structure should be respected whenever possible.
- The NIB should establish a process which ensures that all relevant parties, bodies and authorities, also in other member states are duly identified. This task is part of the investigation plan and should be performed in the beginning of the investigation but updated regularly if necessary.
- The NIB should develop also a strategy for the communication of the report. While the dissemination of a printed version may be useful in some cases (could be considered e.g. for victims and the relatives), usually it will be sufficient to disseminate the report via e-mail; even a link to the published report could be sufficient.
- The dissemination should be duly documented.

For further details, see “Guidance on good reporting practise /3/



5.12 Publication and monitoring

5.12.1 Publication

Article 23.2

“The investigation body shall make public the final report in the shortest possible time and normally not later than 12 months after the date of occurrence. ...”

Guidance

- There is a clear obligation to publish the investigation reports. The NIB must be aware that with the publication of the reports, its work becomes transparent to the public. Hence, the NIB should implement processes to ensure the quality of the investigation and the final report; see section 4.3.
- The NIB should establish a process which in normal circumstance will enable the NIB to publish the final report not later than 12 months after the occurrence; this includes the time need for the processes between the finalisation of the “technical” work and the publication date.

If in exceptional cases it is not possible to publish the investigation report within 12 month, there should be reasons, e.g.

- a very complex accident
- Delay caused by an unexpected series of serious accidents which have to be investigated

Good practise

In several member states the legal provisions requires and interim report after 12 months or the communication of the reasons, why the objective of 12 months could not be achieved.

5.12.2 Monitoring

Reference to the RSD

Article 25.3

The safety authority and other authorities or bodies or, when appropriate, other Member States to which recommendations have been addressed, shall report back at least annually to the investigating body on measures that are taken or planned as a consequence of the recommendation.

Guidance

- To fulfil the requirements on the content of the annual report (see section 6.1) the NIB should implement a process to monitor the feedback of the addressees of the NIB’s recommendations.
- The NSA and other bodies (e.g. fire and rescue, ambulance, local authorities etc.) to whom the NIB’s recommendations are addresses should implement a process for the follow up of investigations and the recommendations. The NIB may support the implementation of such processes in particular with such bodies which are not familiar with the obligations.



- The report of the addressee of a recommendation to the NIB must name measures that are taken, planned, in the process of implementation or not taken as a consequence of the recommendation.
- When the addressee reports “planned” measures, a time frame for the implementation should also be reported.
- The duty of reporting back to report back “at least annually” ends, when
 - the measures taken by the addressee to reduce or avoid the risk are implemented; it is within the discretion of the addressee to decide when a recommended measure (or another measure to deal with the identified risk) is to be considered as “implemented”.
 - after the first report when the addressee has decided not to follow the recommendation at all; in this case the disagreement and the reasons should be reported to the NIB.
- There is no obligation for the NIB
 - to check the content of the report of the addressee,
 - to comment on the report,
 - to comment on or to agree with the measures the addressee has taken, if he didn't follow the recommendation.

The only responsibility of the NIBs is to report actions taken after a recommendation to the Agency within their annual report in terms of article 23 (3).

Good practice:

- When issuing a safety recommendation some NIBs ask the addressee of the recommendation for short-term feedback (e.g. within one month) about the addressee's and/or the end implementers decision to implement a recommendation or not, about the time frame of implementation and other information.
- Some NIBs have agreed upon regular meetings with the NSA concerning the follow-up of the recommendation.
- In any case, an open dialogue and a mutual share of safety information between the addressee and the NIB support the appropriate follow-up of a safety recommendation.
- Reporting back allows the NIB
 - to consider the effectiveness of the recommendations it has made
 - to use the feedback to improve the development of future recommendations
 - to identify systematic deficiencies in the way the addresses (or the end-implementer) react on recommendations.

Other NIBs will have a benefit also when the feedback reports are publicly available.



6 Other obligations of an investigation body

6.1 Annual report

Reference to the RSD

Article 23.3

Each year the investigating body shall publish by 30 September at the latest an annual report accounting for the investigations carried out in the preceding year, the safety recommendations that were issued and actions taken in accordance with recommendations issued previously.

Guidance

The NIB should have arrangements to publish by 30 September an annual report. The annual report must contain at least the following elements:

- the investigations carried out in the preceding year,
- the safety recommendations that were issued,
- actions taken in accordance with recommendations issued previously

The publication of the safety recommendations issued by the NIB and the responses of the NSA respective the other addressees of the recommendation provides transparency of "lessons learned" from accidents.

Article 23 (3) doesn't prescribe a special form for this content. Previously, the Agency with support of the network of NIBs has developed a form. The Agency together with the NIB network will further develop the best way for this report.

6.2 Cooperation in the Network of NIBs

Reference to the RSD

Article 21.7

The investigating bodies shall conduct an active exchange of views and experience for the purpose of developing common investigation methods, drawing up common principles for follow-up of safety recommendations and adaptation to the development of technical and scientific progress.

The Agency shall support the investigating bodies in this task.

Guidance

As the co-operation of the investigation bodies is contributing to the objectives of the Directive, this co-operation is mandatory.

To comply with this requirement, the investigation bodies should regularly join the meetings organised by the Agency. The participation of each single investigation body in the work of the task forces is appreciated. The contribution by analysing the methods of other investigation bodies is as valuable as providing documents actively.



Time and effort for this co-operation should be taken into account by calculating the necessary resources of an investigation body. Experience shows that in particular smaller NIBs benefit from the exchange of information and experience; the additional workload will be rewarded by accelerating the process of learning and establishing.

Good practise

Besides the participation in the network of investigation bodies, most NIBs are participating actively in task forces, regional groups of NIBs, or conduct a regular informal exchange of views by phone, e-mail or other means.



Annex

I. Definitions according to Article 3 of the RSD

- ‘railway system’
means the totality of the subsystems for structural and operational areas, as defined in Directives 96/48/EC and 2001/16/EC, as well as the management and operation of the system as a whole
- ‘safety management system’
means the organisation and arrangements established by an infrastructure manager or a railway undertaking to ensure the safe management of its operations;
- ‘investigator-in-charge’
means a person responsible for the organisation, conduct and control of an investigation;
- ‘accident’
means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion, fires and others;

Guidance

The definition shows that the term accident refers only to accidents in the railway system as defined.

According to Articles 21.4 and 21.6, Member States may entrust the NIB with a wider scope.

- ‘serious accident’
means any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway safety regulation or the management of safety; ‘extensive damage’ means damage that can immediately be assessed by the investigating body to cost at least EUR 2 million in total

Guidance

‘Serious accidents’ are:

- Any train collision, which results in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment,



- Any train derailment, which results in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment,
- Any other accident, which results in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment and has an obvious impact on railway safety regulation or the management of safety.

It is not expected that investigation body calculate the damage exactly. Some guidelines:

- The investigation body is expected to estimate, not to calculate.
- The investigator's experience is the best scale.
- Only direct costs should be considered
- Try to get a rough overview on the damage.
- Take into account the damage to the environment

- 'incident'

means any occurrence, other than accident or serious accident, associated with the operation of trains and affecting the safety of operation;

Guidance:

The scope of an "incidents" is limited to any occurrence 'associated with the operation of trains and affecting the safety of operation'.

'Occurrences associated with the operation of trains' are:

- Any occurrence a train is directly involved
- Any occurrence a train is not directly involved but may be considered as applicable also for trains
- Occurrences affecting the safety of operation are any occurrence which may be considered as potential risk to persons or property generated by the railway system.

Both criteria must be fulfilled to classify an occurrence as an incident

Good practise

In several member states, the NIB agrees with the IMs, RUs and the NSA on occurrences which are considered as "incidents"

- 'investigation'

means a process conducted for the purpose of accident and incident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations;

Guidance

The generic occurrence investigation process is shown in figure 1:

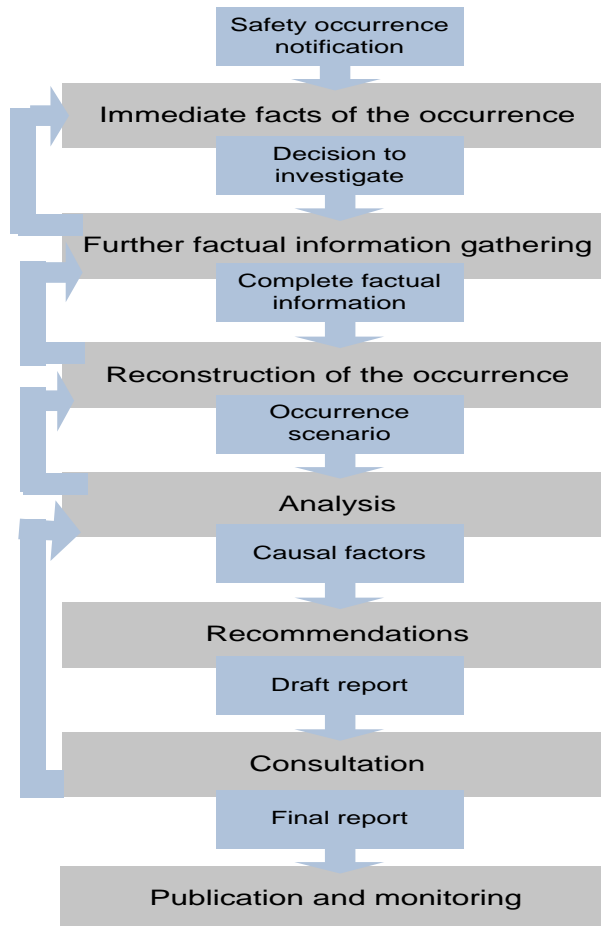


Fig.1: The generic occurrence investigation process

- ‘causes’
means actions, omissions, events or conditions, or a combination thereof, which led to the accident or incident;

Guidance

Any factor including

- any action or non-action of persons



- any action or non-action of technical equipment
- any internal or external event
- any internal or external condition

is covered by the term “causes”

II. Definitions according to the Appendix to Annex I “Common safety indicators” to the RSD, as modified by Directive 2009/149/EC

The definitions below are applicable for the CSI. For achieving a harmonised approach within the scope of the RSD, and to avoid unnecessary confusion, a common understanding of the definitions is essential. Unless subject of specific national legislation, the Agency recommends the NIB’s to apply these definitions.

- ‘train’
means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is considered to be a train;
- ‘train collision’ (or ‘collision of trains’)
including collisions with obstacles within the clearance gauge’ means a front to front, front to end or a side collision between a part of a train and a part of another train, as well as with:
 - shunting rolling stock,
 - fixed or temporarily present objects on or near the track (except at level crossings if lost by crossing vehicle/user).

Guidance

According to /6/, non exhaustive list of fixed objects:

- buffer stops;
- other parts of the infrastructure;
- Non exhaustive list of temporarily present objects:
 - rocks;
 - landslides;
 - trees;
 - lost parts of railway vehicles;
 - lost or displaced loads;
 - vehicles and machines or equipment for track maintenance.



A collision that results in a derailment is counted as a collision. For the purpose of these guidance, animals are counted as objects. Collisions between shunting rolling stock/maintenance machines are classified as type of accident “others”. Collisions against objects lost by a crossing vehicle/user at a level crossing are classified as a level crossing accident. Collisions purposefully caused by applying safety procedures in response to an emergency are to be classified as “others”.

- ‘train derailment’ (or ‘derailment of trains’)
means any case in which at least one wheel of a train leaves the rails

Guidance

According to /6/, re-rail cases are to be included; derailments purposefully caused by applying safety procedures in response to an emergency are to be classified as “others”. Derailment of shunting rolling stock/maintenance machines is classified as “others”; Collisions against rolling stock/obstacles followed by a derailment are not included, these events are classified as collisions.

- ‘level crossing accidents’
means accidents at level crossings involving at least one railway vehicle and one or more crossing vehicles, other crossing users such as pedestrians or other objects temporarily present on or near the track if lost by a crossing vehicle/user;

Guidance

According to /6/, collisions with objects on level crossings are classified as collisions, not as level crossing accidents, except when the obstacle has been lost by a crossing user or has fallen from a non-railway vehicle using the crossing.

Collisions with animals under the control/supervision of a level crossing user are to be counted.

- ‘level crossing’
means any level intersection between the railway and a passage, as recognised by the infrastructure manager and open to public or private users. Passages between platforms within stations are excluded
- ‘accidents to persons caused by rolling stock in motion’
means accidents to one or more persons that are either hit by a railway vehicle or by an object attached to or that has become detached from the vehicle. Persons that fall from railway vehicles are included, as well as persons that fall or are hit by loose objects when travelling on-board vehicles;

Guidance



According to /6/, the following non exhaustive list of events is included, even when relating to stationary trains:

- persons using passages between platforms and struck by a train;
- Persons falling from trains onto the railway line;
- Persons falling from carriages which remain out of platforms;
- Persons falling from trains due to doors opening on the wrong side when in a platform;

All events at level crossings are excluded and classified as level crossing accidents, where related to the use of the crossing.

E.g. : a passenger falling from a train standing at a level crossing is to be classified as ‘accidents to persons caused by rolling stock in motion’.

- ‘fires in rolling stock’

means fires and explosions that occur in railway vehicles (including their load) when they are running between the departure station and the destination, including when stopped at the departure station, the destination or intermediate stops, as well as during re-marshalling operations;”

Guidance

According to /6/, vandalism acts are excluded. Fires during long stops in marshalling yards or in stabling yards are excluded.

A stop in a marshalling yard is defined as “long” when, a check of the efficiency of the braking system is to be done before the rolling stock moves again.

- ‘other accident’ (or ‘others’ or ‘other types of accidents’)

means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences not falling under the definitions of train collisions, train derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion and fires in rolling stock

Guidance

According to /6/, the main cases belonging to this category should be:

- Collisions and derailments of shunting rolling stock/maintenance machines; including those on tracks closed for maintenance operations;
- Collisions and derailments purposefully caused by applying safety procedures in response to an emergency;
- Dangerous goods release during transport;
- Objects projected by trains, like ballast, ice, etc.
- electrocution related to rolling stock in motion