

NIB Network

European Railway Agency

Voluntary Assessment

# **Voluntary assessment of the National Investigation Body of Norway**

## Assessment report

**Version Control**

Document issued by:	European Railway Agency
Released by:	Michael Rebentisch (lead assessor)
Reviewed by:	Michael Rebentisch
Authors:	Aleksandra Perkuszezwska, Ingrid Mahr
Version:	1.0
Date:	16 September 2014
Type of document:	Report
Number of document	ERA-REP-115 SAF
Status of document:	Final

**References**

N°	Description	Reference Nr.	Reference	Version
/1/	Directive 2004/49/EC of the European Parliament and of the Council on safety on the Community's railways 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 of charges for the use of railway infrastructure and safety certification (Railway Safety Directive)	2004/49/EC	Railway Safety Directive (RSD) or the Directive	Directive as last amended by Directive 2009/149/EC
/2/	Act No 34 of 3 June 2005 on Notification, Reporting and Investigation of Railway Accidents and Railway Incidents (Railway Investigation Act)	Act No 34	Railway Investigation Act	
/3/	Regulations No 378 of 31 March 2006 on Public Investigations of Railway Accidents and Serious Railway Incidents etc. (Railway Investigation Regulations)	Regulations No 378	Railway Investigation Regulations	
/4/	Regulation No 379 of 31 March 2006 on the Obligation to Notify and Report Railway Accidents and Railway Incidents	Regulation No 379	Notification and Reporting Regulations	
/5/	REGULATION (EU) No 996/2010 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC	Regulation No 996/2010		
/6/	Act of 19 May 2006 No. 16 relating to the right of access to documents held by public authorities and public undertakings	Act of 19 May 2006 No. 16	Freedom of Information Act	

**Table of abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
AIBN/AIB Norway	Accident Investigation Board Norway
CSM	Common safety method
ECM	Entity in charge of maintenance
ERA	European Railway Agency
ERAIL	European Railway Accident Investigation Links
EU	European Union
IIC	Investigator in charge
IM	Infrastructure Manager
MoU	Memorandum of Understanding
NIB	National Investigation Body
NRR	Notification and Reporting Regulations
NSA	National Safety Authority
QMS	Quality management system
RAI	Railway Investigation Act
RIR	Railway Investigation Regulation
RSD	Railway Safety Directive
SMS	Safety Management System
SPAD	Signal Passed At Danger
TF	Task Force on the Development of method for a voluntary assessment of NIBs

## Table of content

Executive summary .....	6
1 INTRODUCTION .....	8
1.1 Description of the Accident Investigation Board Norway .....	8
1.2 The Norwegian National Railway Context .....	10
1.3 Legislative framework concerning the NIB and its accident investigation .....	11
1.4 Activities of the NIB Norway .....	11
2 VOLUNTARY ASSESSMENT (PROCESS) .....	13
2.1 Assessment objectives .....	13
2.2 Subject and scope of assessment .....	13
2.3 Assessment method.....	14
2.4 Assessment Phases .....	15
2.5 Assessment team .....	16
2.6 Observers .....	16
3 Findings on NIB activities .....	17
3.1 Findings relevant to legislation .....	17
3.2 Findings relevant to organisation of the NIB .....	19
3.3 Findings relevant to investigation process (general issues) .....	22
3.4 Notifications.....	23
3.5 Investigation .....	24
3.6 Safety recommendations.....	26
3.7 Investigation report .....	27
3.8 Information on implementation of recommendations .....	29
4 Conclusions .....	31
5 Confidentiality statement .....	33
6 Distribution list.....	33
7 Annexes.....	34

## EXECUTIVE SUMMARY

### 1. Context

The voluntary assessment of the NIB Norway is part of a series of voluntary assessments of NIBs of the EU Member States (Norway is included as a member of the EEA agreement). During the summer of 2011 it was decided between the Agency and the NIB Network to create a tool for a voluntary assessment of NIBs. The goal of these assessments is to support the NIBs in their role as rail accident investigators, to share good practices between NIBs and to identify areas where their work could possibly be improved. The reason for choosing a voluntary approach is that it is up to each NIB to choose their own way of improving their organisation and practises.

A Task Force on the Development of a method for a voluntary assessment of NIBs (TF) consisting of representatives from the NIBs of Austria, Belgium, France, Hungary, Ireland, Latvia, the Netherlands, Norway, Slovakia, Sweden and Poland has worked together with the Agency since September 2011 to develop an assessment method. The method developed consists of a set of tools, of which the Manual, the Protocol and Templates are the key tools for the performance of the assessment.

The Accident Investigation Board Norway (AIBN), the national authority responsible for independent accident investigation (National Investigation Body – NIB), has volunteered to be assessed by the ERA according to the assessment programme as prepared by the TF. The NIB Norway cooperated actively with the ERA assessment team during the entire assessment period. This assessment report was delivered by the Agency to NIB Norway in September 2014.

During the assessments the assessment method will be applied and modified if needed. The assessment method proved to be useful and practical and there was no need for major modifications seen.

The assessment was carried out in the period from March 2014 (KoM 13/05/2014) to September 2014 (final meeting 16/09/2014) with the onsite assessment carried out in the week of 30 June until 4 July 2014. There were three persons from ERA appointed as assessors. As provided by the assessment manual, other NIBs may act as observer. For the assessment of NIB Norway, the NIB RO and the NIB SE acted as observer.

### 2. Main conclusions

The Accident Investigation Board Norway (AIBN) is a multimodal NIB, covering investigations into all transport accidents: aviation, railway, road and maritime.

It was established in 1989 to investigate air accidents and incidents. The first railway accident investigation started on 1 July 2002; in 2005 the mandate to investigate accidents was expanded to cover road accidents and in 2008 marine accidents. The different transport modes are organised in different departments within AIBN, reporting to the Director General.

The AIBN is independent and focuses entirely on safety and not on apportioning blame or liability. The sole purpose is to improve transport safety in Norway. The NIB has a high degree of **independence** granted by the national legal framework. It has at its disposal a sufficient budget for carrying out investigations.

The organisation of the NIB as a multimodal organisation is **well structured**. The different investigation departments of AIBN share resources, which are at disposal in the Administration department and in the “fagstab”<sup>1</sup>, comprising competencies in safety management, quality management, human factors and legal issues.

---

<sup>1</sup> The Norwegian term « fagstab » is used in the report due to lack of the most relevant English translation

The work of AIBN is transparent towards the public and the stakeholders. The relevant information is available on the website of AIBN. AIBN is involved in the Nordic countries NIB forum and in the NIB network facilitated by ERA, which contributes to its **organisational learning** and fosters the maturity of the investigations carried out.

The reception of the **notification of occurrences** is organised externally and internally: there is a clear legal obligation for RUs and IMs to notify accidents and incidents to the AIBN and an internal system for receiving and processing such notifications. A 24-hour service is ensured.

The **investigations** of railway accidents are of a high quality. They comprise deep technical investigations as well as investigations into roles and responsibilities of all involved actors, including the NSA.

A **quality management system**, which includes templates, checklists and manual documents for the accident investigation and all relevant sub processes has been implemented and is used in practise. It contributes to a high quality and consistency of the investigations. If needed the NIB uses external expertise in its investigations.

The **manual** covers all relevant issues including a work description “methodical investigation”, which includes investigation methods (STEP) and an approach to identify the lack of safety, which has to be corrected by a safety recommendation with the purpose to avoid repetitions of the incident/accident.

The **final investigation reports** are the results of a teamwork approach. They contain all relevant parts and fulfil in general the legal requirements of the RSD. They are well structured and provide good information about the independent investigation. However, some information is not included in the reports, mainly the decision to establish an investigation, the composition of the team of investigators and the conduct of the investigation. Before publication, an internal quality process is foreseen and used in practise. The relevant parties receive the reports one day before the publication. In case of bigger accidents and a high public interest, intermediate reports are issued.

The **safety recommendations** are addressed to the Ministry of Transport and Communication, to the NSA or to other relevant authorities. There is an internal quality check before issuing. Safety recommendations are disseminated by the ministry of transport and communication. The feedback is monitored by the ministry. Twice a year the NSA reports to the ministry. Once the ministry has accepted the proposals of the NSA, AIBN is informed about the results. However, the measures taken are not mentioned in the AIBN’s annual report.

### 3. Feedback, comments and unresolved issues

During the closing meeting of the onsite assessment, the assessment team presented the list of preliminary findings. Here were some minor comments received to the particular findings and the ERA assessment team has taken them into account when drafting the final assessment report.

The draft assessment report building upon the list of findings was submitted to the AIBN for comments and analysis on 29 August 2014. During the assessment exit meeting, taking place on 16 September 2014, some adjustments were agreed upon by the ERA assessment team and the AIBN.

# 1 INTRODUCTION

This final assessment report is the result of the assessment carried out within a limited period of time using the assessment method developed by the Task Force on Development of an assessment tool for NIB assessment (TF). It provides a snapshot on the processes at the Accident Investigation Board Norway.

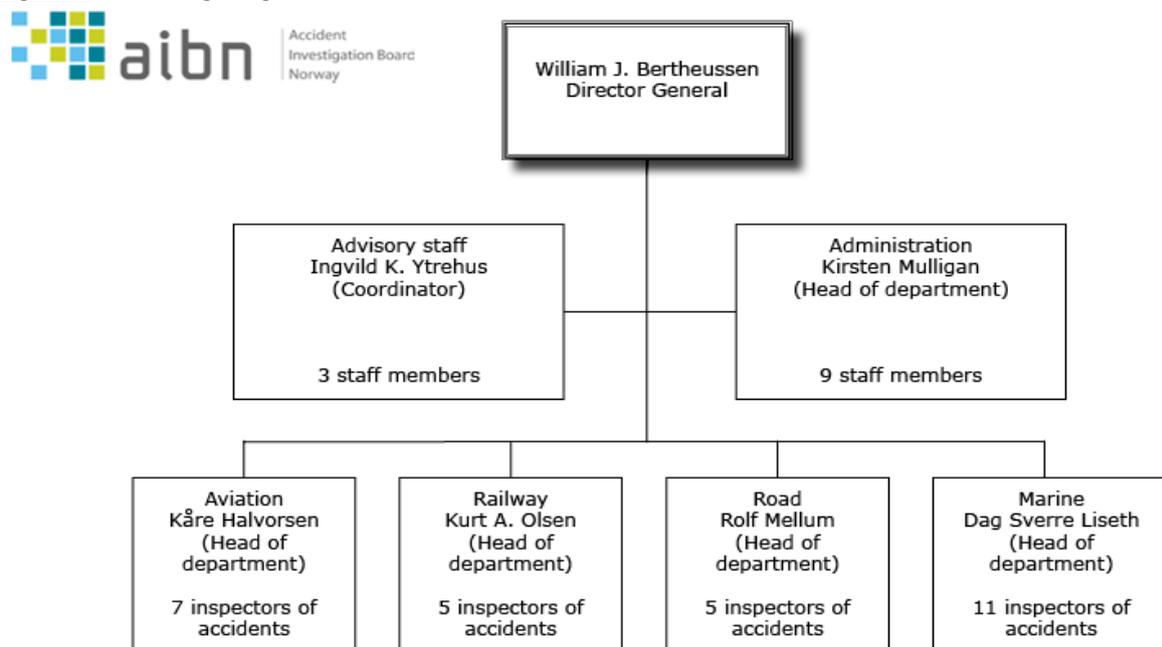
The main objective of this report is to provide the NIB Norway with a feedback on the performance of its activities in practice and in particular on the processes applied within and by the organisation. The ultimate aim of the assessments in general is learning and improving the NIBs as organisations, both in short term and long term.

## 1.1 Description of the Accident Investigation Board Norway

The AIB Norway has been the permanent, independent body of inquiry for transport accidents for more than 20 years. On 10 July 1989, the Accident Investigation Board for Civil Aviation (HSL) was established. In 2002, the mandate of the Accident Investigation Board was expanded to include accidents and serious incidents in the railway sector and the name was changed to the Accident Investigation Board for Civil Aviation and Railways (HSLB). In 2005, the mandate was further expanded to include investigations of accidents and serious incidents in connection with road traffic and the agency's name was changed to the Accident Investigation Board Norway (AIBN). In 2008, the mandate was expanded to include investigation of marine accidents and serious incidents.<sup>2</sup>

Below the organisation and main tasks of the AIBN are described.

Figure 1: AIBN organogram



Source: AIBN website

<sup>2</sup> Source: AIBN website [www.aibn.no](http://www.aibn.no)

The AIBN is an administrative agency under the Ministry of Transport and Communication, from where it gets its budget. The director general of AIBN is appointed by the Ministry. The AIBN consists of 47 staff.

The AIBN has signed a memorandum of understanding with Canada, Finland, Iceland, Sweden, Denmark and the UK in order to support each other during investigations where requested.

The AIBN actively contributes to the network of EU railway accident investigation bodies and its task forces; AIBN is also member of the “Nordic” group.

Apart from AIBN, the NSA (Norwegian Railway Authority) and the Infrastructure Manager (Jernbaneverket) fall under the legal responsibilities of the Ministry of Transport and Communication. The railway legal framework covers every railway undertaking operating in Norway. The AIBN is independent from the NSA and from other railway stakeholders.

In Norway, the investigation of railway accidents is regulated by the following acts and regulations:

- Act No 34 of 3 June 2005 on Notification, Reporting and Investigation of Railway Accidents and Railway Incidents etc. (the Railway Investigation Act) /2/. The Railway Safety Directive 2004/49/EC is incorporated into the Act, which applies to railways, including tramways, underground railways, suburban railways and similar modes of guided transport encompassed by the Railways Act. The Act empowers the ministry to lay down further provisions in regulations.
- Regulations No 378 of 31 March 2006 on Public Investigations of Railway Accidents and Serious Railway Incidents etc. (the Railway Investigation Regulations) /3/ issued by the Ministry of Transport and Communications pursuant to the Railway Investigation Act.
- Regulations No 379 of 31 March 2006 on the Obligation to Notify and Report Railway Accidents and Railway Incidents (the Notification and Reporting Regulations) /4/ issued by the Ministry of Transport and Communication pursuant to the Railway Investigation Act.

The purpose of investigating railway accidents and serious railway incidents is to endeavour to clarify the chain of events and causes, to collect and analyse information, draw conclusions and, if relevant, formulate safety recommendations. The objective is to improve railway safety and prevent accidents and incidents.

Serious railway incidents are reported to the AIBN pursuant to Regulation No 379. The AIBN has personnel on call around the clock.

The AIBN decides on the scope of investigations and how they are conducted. The final investigation report is published as soon as possible and normally no later than 12 months after the railway accident or serious railway incident; if the report is not ready within 12 months, the AIBN is obliged to issue a preliminary report.

The rail department of AIBN, dealing with railway investigations, consists of the director and five investigators. Whenever necessary, specific technical expertise can be provided by the specialised advisory staff (fagstab), which consists of 4 staff members covering safety management, quality management, human factors and legal issues.

The AIBN conducts on average 8-10 railway investigations per year; the investigation reports with safety recommendations are issued to the Ministry of Transport and Communication. The ministry has a legal based co-ordination role for the monitoring of the follow-up of the safety recommendations addressed to the NSA or other bodies.

The NSA Norway also receives and reviews the reports and deals with the safety recommendations addressed to the NSA; where appropriate, the NSA requires the relevant RU/IM to take the necessary measures. After receiving the responses from RU/IM, the NSA reviews and monitors them. The ministry, after discussion with the NSA, reports back to the AIBN about the status of implementation of safety recommendations. All issued investigation reports together with safety recommendations are published on the AIBN website.

## 1.2 The Norwegian National Railway Context

In 1996, the former Norwegian State Railways (NSB) was split into a railway undertaking NSB AS and the infrastructure manager, the Norwegian National Rail Administration (Jernbaneverket), which owns:

- Railway lines
- Platforms and waiting areas
- Stations built since 1996
- Electrification equipment
- Signals and interlocking
- Traffic control systems
- Telecommunications systems

Jernbaneverket is responsible for planning, designing, constructing, operating and maintaining the rail infrastructure, for allocation of track capacity and for operational traffic management.

The Norwegian rail network covers 4170 line-km, of which 251 km (6%) are double-track; there are 704 tunnels, 2446 bridges and 339 stations and stops with passenger traffic. Apart from the south-eastern region of Norway, there are just few railway lines.

There are several railway undertakings having the access agreement with Jernbaneverket:

- Cargolink AS
- Cargo Net AS
- Flytoget AS (Airport Express)
- Green Cargo AB
- Grenland Rail AS
- Hector Rail AB
- LKAB Malmtrafikk AS
- NSB AS (Norwegian State Railways)
- NSB Gjøvikbanen AS
- SJ AB (Swedish Railways)
- TX Logistik AB
- Togåkeriet i Bergslagen AB

In 2013, the Norwegian railways transported more than 31 million tonnes of freight, of which 9.7 million was domestic freight traffic.

As regards passenger traffic, more than 67 million passengers travelled by train in 2013.

The safety performance of railway transport in Norway is above the average in the EU.

### 1.3 Legislative framework concerning the NIB and its accident investigation

The following pieces of national legislation have been provided as relevant for the accident investigation:

- a) Act on the Establishment and Operation of Railways, including Tramways, Underground Railways and Suburban Railways etc., (Railways Act)
- b) Act on Notification, Reporting and Investigation of Railway Accidents and Railway Incidents etc. (Railway Investigation Act) /2/
- c) Regulations on the Obligation to Notify and Report Railway Accidents and Railway Incidents (Notification and Reporting Regulations) /4/
- d) Regulations on Public Investigations of Railway Accidents and Serious Railway Incidents etc. (Railway Investigation Regulations) /3/
- e) Mandate: Directive for the AIBN laid down by the Ministry of Transport and Communications on 12 June 2009.

The Railway Investigation Act (RIA) sets out the legal provisions for the investigation authority. The Railway Investigation Regulation (RIR) assigns the AIBN as investigation authority. With the establishment of the Railway Investigation Act, the previous Chapter V of the Railways Act concerning the investigation of accidents and incidents was revoked.

The AIBN investigations do not consider liability or guilt under civil law or the penal code.

The allocation of budget by the Ministry of Transport and Communication follows parliamentary procedures, which are stated in the administrative law.

### 1.4 Activities of the NIB Norway

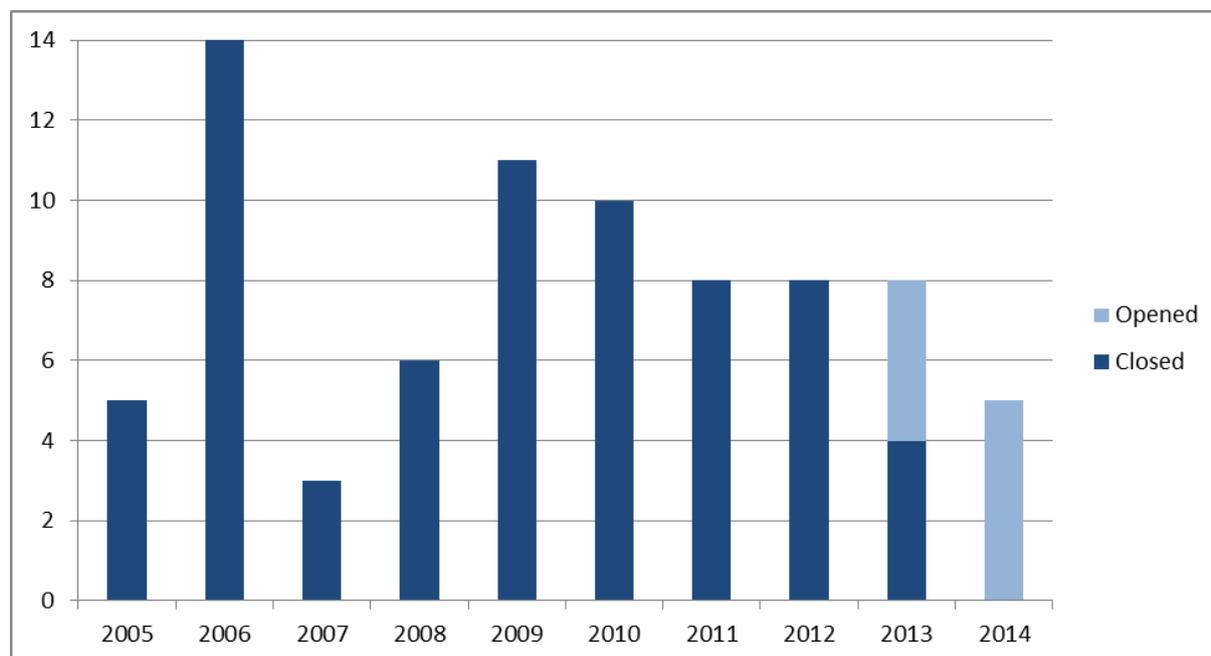
The AIBN is a state agency; it shall promote safety in the aviation, railways, roads and marine by carrying out independent safety investigations, clarifying sequence of events, carrying out an analysis in order to reveal causes and underlying factors significant to the course of events, issuing safety recommendations to improve safety and prevent similar accidents and incidents.

As regards the investigation of occurrences (accidents and incidents), over the past four years 2010-2013, the NIB opened each year on average 9 rail investigations, 27 aviation investigations, 4 road investigations and 10 marine investigations (Table 1).

Year:	Aviation	Rail	Road	Marine
2010	18	9	4	12
2011	42	10	3	4
2012	17	9	4	14
2013	30	9	6	11

**Table 1: Number of investigations (source: AIBN presentation from the kick-off meeting)**

As regards rail investigation data submitted to ERAIL, in years 2005-2014 on average 8 investigations have been started per year (Table 2).



**Table 2: Rail investigations carried out by AIBN per year (source: ERAIL database)**

The data on rail investigations available in ERAIL database shows that accidents represented about 80% of all investigated rail occurrences. Derailments appear to be the most commonly investigated accident type, followed by collisions and fires in rolling stock. Besides the accidents, a wide range of incidents has been subject to NIB investigation in the past years (Table 3).

Occurrence type	Nr	Share
Trains collision	8	10%
Train derailment	22	28%
Trains collision with an obstacle	12	15%
Fire in RS	14	18%
Level crossing accident	3	4%
Accident to persons caused by RS in motion	1	1%
Other	7	9%
Wrong-side signalling failure	3	4%
Broken rails	1	1%
Broken wheels or axles	1	1%
Level crossing event	1	1%
Level crossing near miss	1	1%
Other event	1	1%
Runaway	1	1%
Spad	1	1%
Trains collision near miss	1	1%

**Table 3: Rail investigations carried out by AIBN per occurrence type (source: ERAIL database)**

## 2 VOLUNTARY ASSESSMENT (PROCESS)

### 2.1 Assessment objectives

The objective of the assessment is threefold:

1. To support the NIBs in their role as rail accident investigators
2. To identify areas where the work of NIBs could possibly be improved
3. To share good practices between NIBs

### 2.2 Subject and scope of assessment

The Agency needs specific information on the organisation, practice and performance of accident investigation by the NIBs in order to better support the development of a common approach to safety on the European railways and to actively support and facilitate the exchange of information between the NIBs. The reason for choosing a voluntary approach is that it is up to each NIB to choose their own way of improving their organisation and practices.

The accident investigation process is the key task of the NIBs. The NIB assessment focuses primarily on how the accident investigation process is structured and implemented by the NIB in practice. This NIB assessment emphasizes the best practices and the topics for further improvement. The findings and conclusions of this practice will be recorded in a final NIB report. The NIB assessment is not focusing on the evaluation of legislation, unless the assessment of an investigating body shows deviant findings in practice due to specific national legislation. In order to be able to cover all sub-processes and relevant activities, the accident investigation process is split into five sub-process (parts) and 26 activities. The overview of the sub-processes and 26 activities of NIBs is presented in Annex IV.

The assessment analyses the five parts of the accident investigation process and presents findings for each of them. Generic findings, common to all five sub-processes, complement them.

The five sub-processes of the accident investigation process, each including specific activities, are:

- A. Notification (1-5)
- B. Investigation (6-20)
- C. Safety recommendations (21)
- D. Investigation report (22-25)
- E. Information on implementation of recommendations (26)

For each activity, a reference description is available in the assessment protocols, detailing the expected actions carried out. Note that the framework of accident investigations and the reference descriptions have been developed by the TF and are subject to further development in the future, based on the inputs from pilot assessment.

The assessment is strictly evidence-based. The following evidence was considered by the assessment team:

- Legislation (national legislation, relevant regulations, etc.)
- NIB documents (manuals, investigation reports, annual report, etc.)
- NIB internal notes (including correspondence)
- Interview statements by the staff of the NIB

The overview of the documents and the list of interviewed staff members are available in Annex VI and VII.

## 2.3 Assessment method

The assessment method is outlined in three documents: Manual, Protocols and Templates.

The entire method for the assessment is described in detail in the **Manual**, developed by the TF. The Manual details the process of assessing an NIB, while specifying the roles, responsibilities, tasks and handling of information. It also contains a set of templates that are used during various phases of the assessment. There is also a checklist assuring that all tasks are done in appropriate time, so that the management of resources and activities is assured during the assessment. The Manual also describes the handling of the assessment programme itself, such as managing the resources and confidential information. The role of the Manual is to ensure that all assessments are done in a consistent way. It also helps to assure the highest quality standard in all various aspects of the assessment. The Manual will regularly reviewed by ERA and approved by the Task Force.

The **Protocols** are used in connection with the Manual. They form an inseparable part of the assessment method and represent a main tool for the assessment team for the performance of the assessment. Protocols allow assessing NIB activities in a systematic and traceable way. The Protocols set up a reference framework, not a standard. The reference framework arises from legislation, ISO standards and good practice identified across the EU in the field of independent accident investigation as identified by the TF. The investigation process consists of 26 activities, which are divided into five sub-processes. This disaggregation of the accident investigation process is a result of a current state of knowledge and will be subject to changes in the future, based on the experience gained by the TF and ERA during the pilot assessment of NIB Hungary and of the other volunteering NIBs.

The **templates** include, among other things, draft agendas for the different types of meetings that are to be held during the assessment, a format for meeting minutes and interview sheets. The use of templates during the assessment assures the highest level of quality, clarity and transparency during all phases of the NIB assessment.

The criteria considered during the assessment are not only legal requirements introduced by EU legislation, but also the criteria introduced by ISO9001:2008 standards on the quality of processes. This framework considers five maturity levels ranging from initiating to continuous improvements. The Protocols used for the performance of the assessment contain questions relevant to each of the levels, allowing a judgment to be made about the maturity level of the organisation in respect of the given (sub) process.

Below is a short description of each of the 5 levels (For more details, see Annex V):

1. Purpose achieved (the desired output is delivered without having identified desired inputs/ outputs, resource requirements, etc.)
2. Performance managed (requirements of inputs / outputs are identified and reviewed, activities are planned and performance is monitored, responsibilities are defined, resources are identified and are made available)
3. Process established (a standard process is defined and implemented, the required competencies are identified, personnel performing process is competent, process efficiency is monitored)
4. Process controlled (measurement results are used to ensure that process performance supports defined business goals)

5. Process improved (process improvement opportunities are identified based on innovation and good practice)

It was agreed with the NIB Norway to assess against these levels.

The focus of the assessment was on the key strengths and items for improvement in the organisation of the 26 activities and five sub-processes of the accident investigation process, allowing NIB Norway to identify actions for improving its processes.

## 2.4 Assessment Phases

The assessment process is described in detail in the Manual. According to this document, the process consists of three phases: **pre-assessment**, **onsite** and **post-assessment**.

In the **pre-assessment phase**, all the preparations for the assessment were made, the NIB Norway was asked to appoint a contact person and to provide certain documents for the assessment team to study before the actual assessment. The types of documents that were requested were legal acts, job descriptions and internal manuals for the investigation process, accident investigation reports, annual reports and other publications on the website (see Annex VII for the overview of provided documents). The information that the assessment team gained from these documents served as a basis for interview questions that were prepared before the onsite phase. The pre-assessment phase also included a kick-off meeting held at the premises of the AIBN, chaired by the lead assessor. The aim of that meeting was to make sure that the staff of the AIBN was aware of the principles of the assessment and what would happen during the onsite phase (explanation of the assessment plan for the onsite) and to make sure that all the necessary administrative actions had been taken (booking of rooms for the onsite phase etc.). The AIBN also had the opportunity to give additional information to the assessment team. Both NIBs acting as observers (NIB RO and NIB SE) took part in the Kick-off meeting.

All activities during the **onsite phase** took place as scheduled (see Annex II on audit plan). These activities consisted of an opening meeting, interviews with AIBN and ministry staff and a closing meeting. The whole phase lasted five days and took place at the AIBN premises in Lillestrøm. The interviews with the reporting line in the Ministry of Transport and Communications took place in the Ministry premises in Oslo. The opening meeting was held on the first day. The staff that was to be interviewed during the week as well as the director general of the AIBN were present. The aim of the meeting was to confirm the assessment plan and to make sure that all persons involved in the assessment were aware of its principles and procedures. The first day also contained interviews with the AIBN director general, the head of the railway department, and the staff responsible/involved in Human resources and Finance issues.

On day 2 there were also four interviews with the human factors specialist, the quality manager, the co-ordinator of the advisory staff and the archivist.

On day 3 there were originally planned two interviews with the reporting line in the ministry. For practical reasons, they were merged into one, covering general issues and budget.

On day 4 there were five interviews, with the individual investigators from the railway department, focussing on the accident investigations for which the final reports had been analysed by the assessment team.

On the day 5 there was another interview with the head of railway department, to clarify all the points and questions, which appeared during the previous interviews.

Due to the holiday season, the legal advisor was not available during the onsite phase. For that reason, the interview with the legal advisor was carried out as telephone interview some days before the onsite phase.

On average each interview lasted about one hour and was followed by an internal meeting of the assessment team to summarise the findings. During the interviews, the assessment team asked for evidence. Such evidence was usually provided by showing the relevant files in the electronic archiving system; in addition, printed versions were made available where appropriate.

The Voluntary Assessment Programme assures a continued dialogue between the assessment team and the assessed NIB. It is important that the NIB has a chance to immediately correct possible misunderstandings and react to the preliminary findings. For this reason, the team started each day (except the first and last day) with a meeting where the NIB was informed about the preliminary findings from the previous day. The dialogue on these meetings was very open and constructive and it is recommended that this way of working is kept in the coming revisions of the Assessment Programme.

The draft minutes from each interview have been sent to the interviewed person for review at the latest in the morning of the next day, which was very much appreciated by the AIBN. Thanks to such organisation and the good cooperation of the assessed NIB, all interview sheets have been finalised by the end of day 5 of the onsite phase.

The onsite phase finished with a closing meeting where all the findings of the onsite assessment were presented, discussed with and accepted by the management of the AIBN.

The main activities of the **post-assessment phase** were to further study all the available information and to prepare the assessment report. This report has been discussed with the AIBN at an exit meeting, held at the premises of the AIBN in Lillestrøm on 16 September 2014.

## 2.5 Assessment team

The assessment team consisted of three staff members of the ERA.

- Michael Rebentisch, Acting Head of Sector, Safety Unit, ERA – lead assessor
- Ingrid Mahr, Seconded National Expert, Safety Unit, ERA – assessor and legal advisor
- Aleksandra Perkuszevska, Project Officer, Safety Unit, ERA – assessor

All assessors have an extensive experience in the railway field and are qualified lead auditors for QMS according to ISO 9001:2008 standard. The lead assessor and the assessor/legal advisor have already performed assessments of other NIBs.

## 2.6 Observers

As provided by the assessment manual, other NIBs may act as observer. For the assessment of NIB Norway, the NIB RO and the NIB SE acted as observer during the different phases of the assessment in order to monitor the assessment and to provide the assessment team and the Task Force with comments to improve the assessment tools, as well as to get prepared for their own NIB assessment in the future.

Two representatives of the NIB Romania and one representative of the NIB Sweden took part in the Kick-off meeting.

During the onsite phase, the NIB RO took part on the last 3 days whilst the NIB SE has apologised.

None of the observers took part in the Exit meeting.

### 3 FINDINGS ON NIB ACTIVITIES

This chapter contains eight sub-chapters (3.1 to 3.8) with the findings of the assessment. The first sub-chapter refers to legislation, the second to the organisation of the NIB and the third to general issues of the investigation process. The further chapters cover the five sub-processes. For each sub-process, a general *Description of the sub-process* is first given, summarizing the expected activities and actions carried out within the process in theory.

In the following sub-chapters, only the main points that have been identified during the assessment are presented. They are based on the factual evidences identifying the *Key strengths* of the AIBN regarding the assessed activities. While checking the gathered evidences against the Protocols, less positive points have also been identified. They are reported below as *Items for improvement*. They should be read as findings made by the assessment team that could be taken into consideration by the AIBN in particular while developing its improvement plan.

#### 3.1 Findings relevant to legislation

##### Summary of findings

The NIB Norway (AIBN) has been legally set up in 1989 as investigation authority for accidents and incidents in the aviation. Since 2002, AIBN is in charge to investigate also railway accidents and incidents.

The relevant legislation for railway accident investigation in Norway consists of:

- the railway investigation act (RIA),
- the railway investigation regulations (RIR),
- the notification and reporting regulations (NRR),
- the directive for the AIBN (mandate),
- the administrative rules governing public service in Norway.

The Norwegian legislation does not define “serious accidents” but introduces the definition of a “serious railway incident” as an “unwanted event which under slightly different conditions might have led to a railway accident” (RAI, section 5). The AIBN has the obligation to investigate all accidents and serious incidents (as provided in RIA Section 10 and in RIR Section 6).

This concept is similar to the legal situation for aviation (Regulation (EU) No 996/2010 /5/) and goes thereby beyond the minimum requirements for the railway as set out by the RSD /1/.

According to RIR Section 6, the extent of the investigations and the procedure to be followed in carrying out such investigations has to be determined by the investigating authority. In deciding whether to carry out a “full investigation” the AIBN may inter alia take into account:

- The seriousness of the accident/incident,
- Whether the accident/incident forms part of a series of accidents/incidents relevant to the railway system as a whole,
- The impact of the accident/incident on railway safety on an EEA level,
- Requests from IM, RU, other railway operations, as well as from supervisory and safety authorities or EEA states.

The concept of “full” and “simplified” investigations also originated from the aviation mode; since 2013, the railway department of AIBN doesn’t apply this distinction for railway accidents and incidents any more in practise.

Norwegian administrative legislation (e.g. freedom of information act, archiving act) sets out a framework, which already ensures traceability, a certain level of quality and independence.

The ministry of transport and communication is the budget authority for the AIBN. Further on, it just has an administrative relation to the NIB. In addition, the ministry provides the necessary legal framework for the work of the NIB as requested by Norwegian legislation.

The Directive on accident investigation sets out the clear mandate for the NIB.

The assessment team does not have any indication that the ministry takes influence on the AIBN’s daily work. Except for the post of the Director General of NIB, who was selected in an open selection procedure supported by external experts, the ministry is involved neither in the staffing issues of the AIBN nor in the investigation process itself.

The allocation of budget by the ministry follows usual governmental and parliamentary procedures, which are stated in the administrative legislation. Based on the estimations provided by the different agencies (incl. AIBN) and ministry departments, there is a first budget meeting on government level in March of each year. The government decides the budget proposal for the next fiscal year (priorities and allocations) in August. The Parliament decides in November/December on the final budget.

If necessary, additional budget might be requested; necessary amendments to the budget will normally be decided in May and/or December.

The amount of budget increased in the last years mainly because the AIBN got new tasks (investigation of occurrences in the road sector). The budget for 2014 in the amount of 63,4 mio NOK (~ 8 mio €) was assigned by letter of the ministry of transport and communication of 20.12.2013. With this letter the ministry has set up objectives for the work of the AIBN and has requested regular reporting.

AIBN reports in a four-month-period to the ministry whereby the third report is replaced by the annual report. There are four meetings per year with the ministry.

About 10 % of the budget is available for accident investigation in the different transport modes. Solely the management of AIBN can decide the use of this budget. For railway, an amount of 1 mio NOK (~ 1,25 mio €) is available.

The assessment team does not have any further indication that the budget will be subject of major cuttings in the next years.

### **Key strengths**

- The AIBN is a multi-modal investigation body (railway, maritime, aviation and road).
- The framework for independence is organised:
  - in the national legislation
  - there is a possibility to hire experts, if needed
  - the positioning of the NIB (independent Agency under the Ministry of Transport and Communications)
  - decision making by the Director General of the NIB/railway department of the NIB
  - the application of the general administrative rules for public services.

- Sufficient budget
- There is no indication that the ministry influences the work of the NIB, neither related to staffing nor related to the investigations itself.
- The budget is allocated every year following a regular process, which is stated in the administrative law.
- The Ministry of Transport and Communications allocated sufficient budget for 2014 by letter of 20 December 2013, according to the AIBN needs.
- There is no indication for budget restrictions for the following years; the financial planning is stable for the NIB.
- Except of the salaries, there is flexibility for the AIBN to spend the budget.
- Between the NIB and the ministry there has been established a reporting system including the use of the budget.

## 3.2 Findings relevant to organisation of the NIB

### Summary of findings

AIBN is a multimodal organisation, covering four transport modes: aviation, railway, maritime and road, with 47 employees. Within the organisation, there are the following departments and units:

- Administration with 1 head of department and 9 staff members,
- Fagstab (advisory staff) with 1 coordinator and 3 staff members, directly subordinated to the Director General
- Aviation department with 1 head of department and 7 inspectors of accidents,
- Railway department with 1 head of department and 5 inspectors of accidents,
- Road department with 1 head of department and 5 inspectors of accidents,
- Marine department with 1 head of department and 11 inspectors of accidents,

The fagstab staffs provide the specialised expertise in technical aspects and human factors by participating in the investigations as members of the investigating teams.

The independence of the AIBN is ensured by the legislation.

The AIBN has own, modern premises in Lillestrøm (between Oslo Centre and Oslo Gardermoen airport) with good connection to the road and railway network.

The AIBN provides comprehensive information on its website; most relevant information is available also in English.

According to the administrative legal requirements, the AIBN has implemented an electronic archive system. In general, all incoming and outgoing files as well as important internal files are registered and – according to the Norwegian Freedom of Information Act – accessible to anybody.

AIBN has developed and implemented a quality management system (QMS) covering

- The quality assurance handbook
- The management processes
- The core processes related to the investigation process
- The support processes

The investigation process is divided into 5 sub-processes

- Notification
- Pre-investigation
- Investigation
- Consultation
- Conclusion

Each of the sub-processes contains several documents subdivided into procedures and work instructions. All documents are applicable to all transport modes unless marked specifically (e.g. J = jernbane = railway).

For the railway mode, important issues (e.g. ECM regulation, the requirements on the SMS according to RSD Annex III) were missing in the QMS documents.

The QMS is designed taking into account the requirements of ISO 9001:2008 and has been implemented as an electronic tool. All documents are linked with other documents in the system by using hyperlinks. In addition, the approval process is processed electronically. The platform used for the QMS does not ensure the traceability of the document versions; it just keeps the latest version.

Within the QMS, there is also a procedure on change management in case of any change needed in the documentation.

During the interviews, it appeared that the degree of routine with using the QMS procedures varies amongst the staff members. The assessment team also found several documents in the QMS, which were marked as “not valid”.

Within the fagstab, there is one person responsible for quality and assuming the role of the quality manager. In 2011 – 2012, due to reorganisation of the departments and some unpredictable loss of staff, the fagstab faced a difficult staff situation, where instead of four staff members there was only one person. At that time, the priority was given to investigation activities over the QMS issues. For that reason, the QMS was not updated regularly during this time.

In order to further improve, AIBN has started in 2014 to carry out internal audits according to the QMS. The internal audit has focussed in 2014 on the notification process in all transport modes. For the following years, an audit programme has been decided upon.

Within the support processes of the QMS, also the job descriptions for all staff members are available. AIBN has decided on generic job descriptions rather than individual ones. E.g. in the railway department all inspectors of accidents have the same, generic job description, which is not signed by the individual staff members, but acknowledged online.

Within the QMS, the AIBN has also established a competence management system: all heads of department have to define and maintain the competencies needed in their department. In the annual review with the staff member, his/her competencies are evaluated against the required competencies. For the railway department, 36 competencies have been identified. The competencies are listed in a matrix, which allows an identification of gaps on individual or department basis.

Based on the annual review and taking into account the requirements for the whole department, the individual training needs are identified.

The training budget is 3.5 mio NOK/year (~ 0.5 mio €) for the whole AIBN. Although not documented in the QMS, it is common sense that each investigator in all departments (except administration) has to attend the “Fundamentals of accident investigation” course at Cranfield.

The training policy of AIBN allows also staff to attend (university) courses during their job in order to get higher professional qualification.

Even if applied in practise, an overall training plan is missing, which takes into account the competencies available in the fagstab.

The AIBN has not defined key performance indicators to measure the outcome of the AIBN's activities. However, the ministry sees the high level of safety performance of the Norwegian railway system as indicator for the performance of the AIBN. In addition, the several departments of AIBN carry out customer surveys amongst the stakeholders in order to measure the level of awareness and the satisfaction with the AIBN's work. For the railway department, the last survey was carried out in 2009 by asking about 600 people in the different areas (RU, IM, politic, etc.).

AIBN has implemented a structured approach on internal and external meetings:

- Formal meetings with the Ministry of Transport and Communications	Four meetings per year	
- Informal meetings with the NSA	Two meetings per year	
- Meeting with RUs and IMs	One meeting per year	
- Management meetings	Every month	Director General and Head of departments
- Department meeting	Every month	Head of and all staff members of the railway department
- Monday meetings	Every Monday	All AIBN staff

The railway department consists of the Head of the department and five inspectors; all of them are highly qualified.

The number of staff is reasonable in relation to the performed investigation (on average 8 – 10 per year). As all investigations are managed in teams, each inspector is involved in 3 – 4 investigations per year on average. As already identified by the internal audit in spring 2014, there might be a risk of a lack of railway specific knowledge in the future, as it's difficult to recruit specialists with relevant skills and experience.

The overview on the expertise available in the railway department shows currently a lack of special expertise concerning railway signalling technique. AIBN could not close this gap by recruitment, as there were no suitable candidates. AIBN compensates that deficiency by involving external consultation and by specifically training.

### Key strengths

- The AIBN railway department consists of a Head and five investigators.
- The AIBN has established a fagstab consisting of highly qualified staff providing support on specific technical issues (e.g. HF issues) for the NIB where requested by the IIC.
- AIBN has implemented a quality management system in the organisation. Within the QMS there is a change management procedure established.
- Internal audits are foreseen in the QMS and carried out in accordance with a multi-annual audit plan.
- AIBN has established a transparent archiving system in line with Norwegian legislation taking into account requirements of freedom of information act.

- AIBN has established a competence matrix and applies it systematically for identifying training needs/planning.
- AIBN carries out an internal revisions circle with different main topics each year in order to further improve.
- AIBN provides information on a website.
- Information about the organisation, contact information, published reports and recommendations are available in Norwegian and in English language.

### Observation

There might be a risk of a lack of railway specific knowledge in the future, as it's difficult to recruit specialists with relevant skills and experience.

### Items for improvement

- The platform for the quality management system does not ensure traceability of modifications.
- The change management procedure within QMS is not consistently applied.
- The routine in using the QMS and the archiving system varies among staff.
- Some of the procedures/work descriptions are marked as not valid.
- Although applied in practice, an overall training plan taking into account also the competencies available in the fagstab is missing.
- Some issues are missing in the QMS (e.g. ECM regulation, the requirements on the SMS according to RSD Annex III).

## 3.3 Findings relevant to investigation process (general issues)

### Summary of findings

Core part of the AIBN's QMS is the core process on accident investigation describing all procedures and work instructions of the investigation process. However, also the documents of the supporting processes of the AIBN's have significance for the work: the document S 2 "metodisk undersøkelse" (methodically investigation) provides a sample of investigation methods including their scope.

AIBN uses systematically investigations methods that are acknowledged in professional circles (STEP, barrier analysis, fault tree analysis etc.)

The accident investigation is completely carried out by the NIB staff. In all investigations, the fagstab is systematically involved. If necessary, external experts can be hired; this is applied also in practise.

The interviews showed that the procedures are applied in practise.

Due to the geographical situation of Norway, it is very rare that trains belonging to a RU licenced in another state are involved in an accident in Norway. The only network connections are to Sweden; co-operation in such cases is governed by the MoU amongst the Nordic states.

The procedures so far do not mention relevant railway specific issues as requirements on SMS, ECM and the regulations on CSMs and how to investigate. Also neither the guidance developed by the NIB network nor the safety information system (SIS) and its application have been mentioned in the QMS documents. In a few cases the document is approved by the same person who has checked the document.

All external communication on accidents and incidents is carried out by AIBN; only in major accidents, the ministry may give general statements on safety; regarding the investigation, the ministry refers to the responsibility of AIBN.

### Key strengths

- For the investigation process, written procedures and work descriptions are available and are applied.
- The fagstab is systematically involved in the investigation in several stages.
- The NIB carries out external communication on accident investigation.

### Items for improvement

- In a few cases the document is approved by the same person who has checked the document.
- The assessment team could not find any reference to guidance developed by the NIB network in the manual documents.
- The assessment team could not find any reference to the safety information system (safety alerts) in the QMS.
- The assessment team could not find any reference to specific railway requirements in the QMS documents (e.g. investigating into SMS, ECM regulation).

## 3.4 Notifications

### ***Description of the sub-process***

*This process entails the receipt of information on accidents and incidents. The NIB shall be able to respond to such notifications no later than one week after receipt of the information concerning the accident or incident. It shall then apply criteria to decide whether the occurrence should be investigated by the NIB or not. Once the decision to investigate has been taken, the NIB informs the ERA about its decision to open an investigation. The NIB starts preparing the accident investigation, while ensuring that the duty-holders, stake-holders and/or NSA are informed whether a (preliminary) investigation is started or not, so that they have the opportunity to give their opinion.*

### Summary of findings

The obligation on the notification of accidents and incidents is embedded in the Norwegian legislation. All accidents and serious incidents have to be forthwith notified to AIBN (NRR Section 3 and 4) via phone. In addition, written information is mandatory within 72 hours to the AIBN and the NSA. Railway incidents other than serious incidents have to be notified to the NSA within 8 days. The written notification might be done electronically; for that purpose, the AIBN and the NSA have developed a common notification form. This template includes questions on the risk potential of the incident/accident.

AIBN has established the system of 24-hour on-duty for providing the notifications on accidents and incidents.

The assessment team does not have any indication that this obligation is not respected by the RUs/IM. As the obligation to notify accidents and serious incidents to the NIB is addressed to the RUs and the IM, the number of notifications is higher than the number of occurrences.

AIBN statistics for 2013:

Registered notifications	343
Occurrences	234
thereof:	
• Serious railway incidents	192
• Railway accidents	42
Preliminary investigations	27
Started investigations	7

Source: AIBN's annual report 2013

AIBN has planned a multi-annual audit programme, which started in spring 2014 with an audit on the occurrence notification and on the desktop investigation. There is an audit report, which contains measures for improvement. These measures have not yet been carried out.

### Key strengths

- AIBN has established a 24-hour on-duty service.
- AIBN has established a notification form on its website taking into account also the risk potential of the occurrence.
- For the notification process, AIBN has carried out an internal audit as first part of a multi-annual audit programme.

To conclude, the NIB Norway has established the sub-process of notification and applies it. With the internal audit carried out early 2014, the sub-process is controlled; areas of improvement are identified, it is planned to implement them.

## 3.5 Investigation

### **Description of the sub-process**

*This process entails a preliminary onsite investigation needed to get a better understanding of the occurrence and to gather the first evidences about the occurrence. Based on the findings of the preliminary onsite investigation, the ultimate decision is made on formally starting the investigation into the occurrence. If the formal investigation is launched, the preliminary investigation becomes part of the standard accident investigation by the NIB. The investigator in charge plans and organizes his/her team and assures coordination with other people at the site, including emergency services (EMS) and the police. The IIC has to consider whether the NIB of another country should be contacted and invited to participate on the investigation, or not. If yes, he/she assures the conditions for an active involvement of foreign NIB. The IIC also needs to plan the investigation in detail, considering the available resources and the need to assure that the quality of the investigation meet the requirements.*

*The evidence at the accident site is gathered and examined. Hearings of witnesses and involved persons are carried out. In order to have an effective and efficient accident investigation for the possible improvement of the railway safety and prevention of accidents, it is sought to link the events, the direct cause, the underlying- and root causes to the Safety Management Systems (SMS) of the duty- and/or stakeholders. So every involved duty holder, stakeholder and the NSA can draw lessons and take immediate measures from their involvement in the accident.*

*Besides earlier interviews of the operational staff, the staff of the management may need to be interviewed to collect evidence and information on the roles, the behaviour of (railway) managers of the involved duty holders, stakeholders, the NSA and any other involved organisations in relation to the occurrence.*

*After having a detailed look into the functioning of the SMSs of the involved actors, the IIC together with the investigation committee decides and concludes how the accident has happened and why. They identify the direct, underlying and root causes relating to the regulatory framework and to the application of the safety management system based on the input of sub-processes and tasks carried out during the investigation.*

### **Summary of findings**

The reaction on incoming notifications is described in the QMS documentation. At first, the officer-on-duty has to collect further information. Based on this, he/she establishes contact with the head of the railway department in order to discuss whether an onsite examination should be carried out; the QMS documentation provides also criteria.

In case of onsite-examinations, the composition of the onsite team is agreed upon, considering also the involvement of a fagstab staff member, and the investigator-in-charge (IIC) is determined. Where necessary, the AIBN has the possibility to rent a helicopter. AIBN proceeds to the accident site always with a team of at least two staff members.

The interviews showed that this procedure is applied consistently.

At the accident site, the co-operation with the police is limited to the exchange of physical evidence.

Based on the findings at the accident site, the IIC drafts a “mandate” for opening an investigation. The “mandate” is a standard template where the IIC has to set up an investigation plan incl. the determination of the objectives, the scope, the limits, the necessary resources and the time schedule of the investigation.

The criteria for determining the decision for starting the investigation, draft scope and extent of an investigation are based on the experience and the knowledge of the investigators, the management and fagstab; the final scope and extent is decided in the starting meeting based on the knowledge of all staff members involved. The criteria for determining the decision to investigate are not specified in the QMS manual.

Once AIBN has decided to open an investigation, it informs all involved parties; with the information on conducting an investigation, AIBN request IMs, RUs and, if applicable, other parties to provide relevant information.

AIBN has introduced a checklist (“notimark”) to be used during the onsite examination and the whole investigation. The checklist contains also human factor and organisational issues; however, important issues are missing (e.g. safety certification, ECM). Without mentioning the legal requirements concerning the SMS of the RU and IM directly, many topics on the checklist are closely linked with the SMS. For that reason, SMS issues are always part of the investigation.

During an investigation, members of the fagstab can be involved as part of the investigation team, or as “advisor”. Fagstab members provide support in both: the collection of evidence (e.g. preparation and conduct of interviews) and the analysis.

During an investigation, the status and the investigation plan are regularly discussed internally in team meetings (including the investigators not involved in this investigation) and updated where necessary.

According to the QMS, there must be a review of the investigation process after the investigation. For at least two investigations per year, this is applied in practise. The staff of the Railway Department and representatives from the “fagstab” is present in these meetings. According to the QMS documents, it is the task of the Head of Department to bring any issue from such reviews to the notice of the management in order to review and where necessary to improve the procedures and work instructions.

The process of the investigation is much formalised, standard investigation methods (e.g. STEP, barrier analysis) are applied. In regular team meetings, AIBN monitors and, where necessary, updates the investigation progress.

### Key strengths

- Within its QMS, AIBN has established a standard process for the investigation and applies it.
- The onsite examination is always carried out by a team of at least two investigators.
- AIBN has developed a checklist for the onsite examination and the further investigation.
- AIBN follows a structured and documented approach for the decision to open an investigation.
- AIBN sets up an investigation plan for each investigation.
- The manual contains methods for the investigation.
- The technical investigation is deep and exhaustive.
- SMS investigation is carried out and well structured.
- Additional investigations (in relation to RSD Annex V) are carried out:
  - Supervision activities
  - Collaboration between actors
  - Cultural issues
- AIBN carries out also thematic investigations (e.g. on SPADs).
- For at least two investigations per year, a review of the investigation process is carried out.

### Items for improvement

- The checklist for the onsite examination and the further investigation does not contain important issues related to European legislation, e.g. safety certificates, ECM and CSMs.

To conclude, the NIB Norway has established the sub-process of accident investigation and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

## 3.6 Safety recommendations

### *Description of the sub-process*

*Safety recommendations can be issued in any phase of the accident investigation process, but they are typically issued at the end of an investigation. Safety recommendations shall in no case create a presumption of blame or liability for an accident or incident and they shall be addressed to the NSA (and, where needed, to other bodies or authorities in the Member state or other Member States). When appropriate, draft recommendations are produced that will be implemented by the duty holders, stakeholders and/or the NSA in a short term with the aim to prevent similar accidents or incidents and improve the railway safety. NIBs shall collect feedback annually on the actions that have been taken as a result of their safety recommendations.*

### Summary of findings

The process of drafting recommendations is also governed by the QMS. After the analysis has been finalised, a meeting is held in order to discuss about safety recommendations. Before this meeting, the IIC has to complete a form question list about the intended recommendations.

The QMS manual also provides the possibility to issue urgent recommendations during an investigation (“interim recommendation”).

When wording safety recommendations, AIBN applies the “stand-alone” approach; this means, all recommendations contain an introduction on the specific finding related to the individual recommendation; this facilitates the reader to understand the recommendation without reading the investigation report.

The safety recommendations are addressed to the Ministry of Transport and Communication, the NSA or the other relevant authorities. All recommendations go via the Ministry of Transport and Communication.

The assessment team could not find any reference to the “Guidance on safety recommendations” or to the “Safety Information System” established by the network of EU investigation bodies.

### Key strengths

- Safety recommendations are issued.
- There is a process to issue urgent recommendations during an investigation.
- There is an internal quality check (incl. a meeting) before issuing recommendations.
- Safety recommendations are addressed to the NSA, and, where applicable, to other authorities.
- The safety recommendations contain an introduction, which allows the reader to understand the background of the safety recommendation.
- The wording of the safety recommendations do not create a presumption of blame or liability for the occurrence.

### Items for improvement

- A reference to the Agency’s safety information system (SIS) is missing in the QMS
- Reference to the ERA guidance on Safety Recommendations is missing in the QMS.

To conclude, NIB Norway has established the sub-process of safety recommendations and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

## 3.7 Investigation report

### *Description of the sub-process*

*This process entails the preparation, production and dissemination of the investigation report with the aim to inform those parties involved (e.g. RUs/IMs and the NSA) about the results of the investigation. The report should contain information about the direct, underlying and root causes of the occurrence, the measures taken by duty holders, stakeholders and/or the NSA during the investigation, and the proposed recommendations (to draw lessons to be learnt from the accident), if appropriate.*

*The IIC prepares the draft report in cooperation with the members of the investigation committee. The draft report is then internally reviewed before being sent to involved duty holders and stakeholders, as well as the NSA for comments. This consultation enables the NIB to verify the accuracy of the content of the report by giving those who may be affected an opportunity to make proposals to correct any factual discrepancies or to point out any relevant considerations that have not been taken into account according to them.*

*The adjusted report is then finalized and made publically available in order to inform the duty holders, stakeholders, the NSA, the victims and/or their relatives and the general public about the results of the accident investigation and the lessons which have been learnt or can be learnt from the accident/incident.*

## **Summary of findings**

The process is described in the QMS and according to the interviews, applied at AIBN.

When an investigation cannot be finalized in 12 months, AIBN issues a preliminary report. A preliminary report is delivered also in cases of major accidents when a high public interest exists.

Until 2013, AIBN has used two different formats for the final report: a simplified report and a full report. Three out of five accident reports evaluated by the assessment team have the “simplified report” format; the other two have the “full report” format.

Both formats contain comprehensive information on the occurrence and the findings and in general the information requested by Annex V of the RSD. Main differences are that the table of content and a summary are missing in the “simplified” form; the facts of the occurrence are summarised in a table.

Both formats are clear structured; the structure is applied consistently.

In both formats there is no information about the decision to establish an investigation and the conduct of the investigation; there is also no information about the composition of the investigation team. In the summary of the “full” format, AIBN does not quote the whole recommendations issued but just mention the general content and objective.

The draft final reports are first discussed between the IIC and the head of the railway department, and then other investigators and the fagstab internally review them.

When the internal review circle has been finished, the draft report is distributed to the involved parties and the relevant authorities for commenting.

After review of their comments, the final report is sent to the relevant recipients and – one day later – published.

Recent AIBN’s reports contain both: summary and safety recommendations in English. In case of major accidents or in such cases where AIBN sees relevance for other countries, the entire report is available in English. Summary and recommendations are provided by AIBN when uploading the information to ERAIL.

## **Key strengths**

- Investigation reports are sent to the recipients one day before they are published.
- Investigation reports are published.
- Preliminary reports are issued and published.
- Summary and safety recommendations are translated into English.
- Important Investigation reports are translated into English.
- There is an internal quality check of the draft report involving the fagstab before external communication.

#### Observation

- Safety recommendations are not fully quoted in the summary.

#### Items for improvement

- The decision to establish an investigation, the composition of the team of investigators and the conduct of the investigation are not recorded in the reports.

To conclude, NIB Norway has established the sub-process of investigation report and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

### 3.8 Information on implementation of recommendations

#### *Description of the sub-process*

*This process entails the follow up of safety recommendations. The aim is to have feedback from the NSA on the implementation of the safety recommendations, based on the accident investigation reports and whether the parties involved have learnt from them by taking effective measures to prevent similar accidents or to improve the railway safety.*

#### Summary of findings

The recommendations are addressed to the NSA and other bodies where necessary but in all cases they are disseminated through the ministry of transport and communication. The ministry distributes the recommendation where not addressed to the NSA to the responsible ministry (e.g. for interior where police issues are subject of the recommendation).

According to the Norwegian legislation, the ministry monitors the feedback of the addressees. Twice per year, the NSA reports to the ministry about the status of recommendation addressed to the NSA, the measures taken and proposals on closing certain recommendations. About one month later, the report of the NSA is discussed between the NSA and the ministry. Once the ministry has accepted the proposals of the NSA, the report is sent to the AIBN including the confirmation of the ministry that it has accepted the proposals of the NSA.

Within its QMS, AIBN has not defined any procedure or work description in order to evaluate the feedback of the addressees.

The recommendations issued and the status are mentioned in AIBN's annual report to the Agency but not the measures taken.

#### Key strengths

- The legal obligation to report on recommendations in the annual reports is fulfilled.

- The ministry of transport and communication takes due care on the follow-up process of the recommendations incl. the recommendations addressed to other authorities than the NSA

**Items for improvement**

- In the AIBN annual reports, the feedback on recommendations only inform about the status of the recommendations but not on the measures taken.
- The sub-process of “information on implementation of recommendations” is not governed by the QMS.

To conclude, NIB Norway has achieved the purpose of the sub-process “Information on implementation of recommendations”.

## 4 CONCLUSIONS

The assessment of NIB Norway is part of NIB assessment programme. The intention of the NIB assessment programme is to learn and exchange good practices. The assessment offers a picture of the activities of NIB Norway at the time of the assessment, within the limited time and resources of the assessment team and the assessed NIB. Given these constraints, some conclusions concerning the key strengths and items for improvement for the sub-processes are drawn.

The assessment team identified several examples of **good practice** during the assessment. These include:

- Well educated and trained staff, workload well balanced; no budget restrictions.
- Staff with special expertise (judicial, QMS, health and safety and human factors) shared within the multimodal agency.
- A QMS is established and includes the investigation process and its sub-processes.
- A competence management system is included in the QMS and applied in practise.
- Internal audits are foreseen in the QMS and carried out in accordance with a multi-annual audit plan.
- AIBN has established a transparent archiving system in line with Norwegian legislation taking into account requirements of freedom of information act.
- Communicating the work of the NIB through media and website that is regularly updated with clear and transparent information about the investigation carried out.
- Systematically performing quality checks of the draft investigation report and of the recommendations within the team.
- Providing the summary of the investigation report in English.
- Participating actively in the NIB Network and a regional group of NIBs.

### Conclusions relevant to all sub-processes

AIBN has a high level of independence; this includes sufficient budget and staff and well-equipped infrastructure).

There is a training policy including the commitment for learning and improvement. A quality management system covering all processes of the AIBN has been established. The documents for the core process – the investigation – are easily accessible and applied by the staff. Measures for continuous improvement (audits, feedback, internal quality checks, review of the investigation process) are in place. A multi-annual internal audit plan has been established; the first part was carried out in 2014.

### Notifications

The process of notification is stated in the Norwegian law. AIBN and NSA have developed a common notification form, which also includes questions on the risk potential of the incident/accident. A 24-hours availability is ensured. In the QMS there are procedures and work instructions for this sub-process which are applied and continuously reviewed. The relevant processes for notifications have been internally audited in 2014. Measures for improvement have been defined and will be carried out.

To conclude, the NIB Norway has established the sub-process of notification and applies it. With the internal audit carried out early 2014, the sub-process is controlled; areas of improvement are identified, it is planned to implement them.

### **Accident investigations**

In the QMS of AIBN there are procedures and work instructions for this sub-process which are applied and shall be continuously reviewed. Measures for improvement have been defined and will be carried out (there is an audit programme which started in 2014). In order to have direct implementations of experiences and for the purpose of continuous improvement after major accidents a review of the investigation process is carried out.

To conclude, the NIB Norway has established the sub-process of accident investigation and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

### **Safety recommendations**

The assessment has demonstrated that NIB Norway issues safety recommendations in connection with the investigations carried out both during the investigation and at the end in the investigation report. Investigation into the root causes and the SMS are delivered. In the QMS there are procedures and work instructions for this sub-process which are applied. The safety recommendations focus on SMS issues and are objective-oriented. Most of them are addressed to the NSA.

To conclude, NIB Norway has established the sub-process of safety recommendations and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

### **Investigation report**

In the QMS there are procedures and work instructions for this sub-process which are applied. A quality check is done before the report is finalised; there are procedures for internal and external consultation. Preliminary reports are published in cases of high public interest or if the report cannot be finalised within 12 months.

To conclude, NIB Norway has established the sub-process of investigation report and applies it. AIBN is working towards controlling and improving this sub-process within its audit programme.

### **Information on implementation of recommendations**

The follow up of safety recommendations is mainly managed by the ministry, which ensures that the safety recommendations are duly taken into consideration. This is stated in the Norwegian legislation. AIBN's QMS does not cover this sub-process. In consequence, this sub-process is also not covered by the internal audit programme.

To conclude, NIB Norway has achieved the purpose of the sub-process "Information on implementation of recommendations".

## **5 CONFIDENTIALITY STATEMENT**

The draft assessment report has been developed for the purpose of the assessment to the NIB Norway. All the included information should be confidential within the assessment team and the recipients of the report. For this reason, after its revision by the AIBN, the intermediate assessment report is disclosed to the assessed contact person. Then, the assessed contact person shall submit the report to the recipients of the distribution list, provided by the audited NIB (Annex VII).

## **6 DISTRIBUTION LIST**

At the end of the onsite phase during the closing meetings all findings of the onsite audit were presented, discussed and accepted by the management of the NIB.

The final report is communicated to the following recipients: the NIB Norway.

## 7 ANNEXES

Number	Description of the Annexes
I	List of attendants in the kick-off meeting, entry meeting, closing meeting & exit meeting
II	Assessment plan
III	Protocols
IV	Accident investigation process disaggregation
V	Maturity levels
VI	List of conducted interviews
VII	List of documents used during the assessment

**Annex I: List of attendees at onsite meetings**

Attendee	Function	Organisation	Kick-off 13/05/2014	Entry 30/06/2014	Closing 04/07/2014	Exit 16/09/2014
Michael Rebentisch	Lead Assessor	ERA	X	X	X	X
Ingrid Mahr	Assessor	ERA	X	X	X	X
Aleksandra Perkuszevska	Assessor	ERA	X	X	X	X
William J. Bertheussen	Director general	AIBN	X	X	X	X
Kurt A. Olsen	Head of railway dept.	AIBN	X	X	X	X
Kirsten Mulligan	Head of administration dept.	AIBN	X	X	-	-
Ingvild K. Ytrehus	Advisory staff coordinator	AIBN	-	X	-	-
Ida Hogganvik Grøndahl	Investigator	AIBN	X	X	X	-
Marius Wold Albert	Investigator	AIBN	X	X	X	X
Håvard Sebu	Investigator	AIBN	X	X	X	-
Hans Bjørnseth	Investigator	AIBN	X	-	X	X
Johan Sverre Johansen	Investigator	AIBN	-	-	X	X
Jan Thore Mellem	Senior adviser	AIBN	-	-	X	-
Heidi Rudshaug	Senior adviser	AIBN	X	-	X	X
Johan Gustafsson	Observer	NIB Sweden	X	-	-	-
Dan Marcel Barbut	Observer	NIB Romania	X	-	-	-
Mircea Nicolescu	Observer	NIB Romania	-	-	X	-
Vali Patrascu	Observer	NIB Romania	X	-	X	-

## Annex II: NIB Assessment Plan Phases and schedule

### Assessment Plan phases

<b>Phase, main activities</b>	<b>Dates</b>
<b>Phase I: Pre-assessment</b>	
Agreement and start	
Background information (identification, provision, translation)	
First analysis, kick-off and onsite assessment plan	13 May 2014
<b>Phase II: Onsite assessment</b>	30 June – 4 July 2014
Onsite assessment preparation	
Onsite assessment	
Preparation of assessment report	
<b>Phase III: Post assessment</b>	
Draft assessment report for feedback (closing meeting)	16 September 2014
Comments	
Final report production	
<b>Phase IV: Follow-up</b>	
Communication	
Assessment close note	

## Assessment Plan schedule of the phase II: onsite assessment

## Morning:

	Day 1 30.6	Day 2 1.7.	Day 3 2.7.	Day 4 3.7	Day 5 4.7.
09.00	Entry meeting  <b>A1 A2 A3</b>	Time to inform the management on progress of Assessment (Management and others if interested)	Time to inform the management on progress of Assessment (Management and others if interested)	Time to inform the management on progress of Assessment (Management and others if interested)	Time to inform the management on progress of Assessment (Management and others if interested)  <b>A1 A2 A3</b>
09.30					
10.00	Interview HoNIB (incl. communication issues) <b>William J. Bertheussen</b> <b>A1 A2</b>	Interview HF specialist  <b>Jan Thore Mellem</b> <b>A1 A2</b>	Trip to Oslo	Interview investigators Alnabru (with files)  <b>Hans Bjørnseth</b> <b>A2 A1</b>	Interview HoRD  <b>Kurt Olsen</b> <b>A1 A2 A3</b>
10.30					
11.00	Team meeting	Team meeting	Interview reporting line of the NIB in the ministry  <b>A1 A2 A3</b>	Team meeting	Team meeting
11.30	Interview HoRD	Interview quality manager		Interview Gardemoen (with files)	
12.00	<b>Kurt Olsen</b> <b>A1 A3</b>	<b>Heidi Rudshaug</b> <b>A2 A3</b>	Team meeting	<b>Johan S. Johanson</b> <b>A1 A2</b>	Lunch break
12.30	Lunch break/team meeting				
13.00					Exit meeting

A1= Lead Assessor Michael REBENTISCH,  
A2= Assessor and legal adviser Ingrid MAHR,  
A3= Assessor Aleksandra PERKUSZEWSKA

## Afternoon:

	Day 1 30.6	Day 2 1.7.	Day 3 2.7.	Day 4 3.7	Day 5 4.7.	
13.30	Interview Human resources <b>Kirsten Mulligan/Grete Svee</b> A1 A2	Interview technical advisor <b>Ingvild K. Ytrehus</b> A1 A2	Interview “budget authority” in the ministry  A1 A2 A3	Interview Nykirke (with files) <b>Ida Grøndahl</b> A3 A2	Interview With investigator in training <b>Håvard D. Sebu</b> A1	Exit meeting
14.00						
14.30	Team meeting	Team meeting	Team meeting	Team meeting		
15.00	Interview Finance  <b>Kirsten Mulligan</b> A1 A3	Interview Archive  <b>Kirsten Mulligan/Anne Marit Hansen</b> A2 A1	Trip back to Lillestrøm	Interview Dombas (with files)  <b>Marius W. Albert</b>  A3 A1		
15.30						
16.00	Team meeting	Team meeting	Team meeting	Team meeting		
16.30						
17.00						

A1= Lead Assessor Michael REBENTISCH,  
A2= Assessor and legal adviser Ingrid MAHR,  
A3= Assessor Aleksandra PERKUSZEWSKA

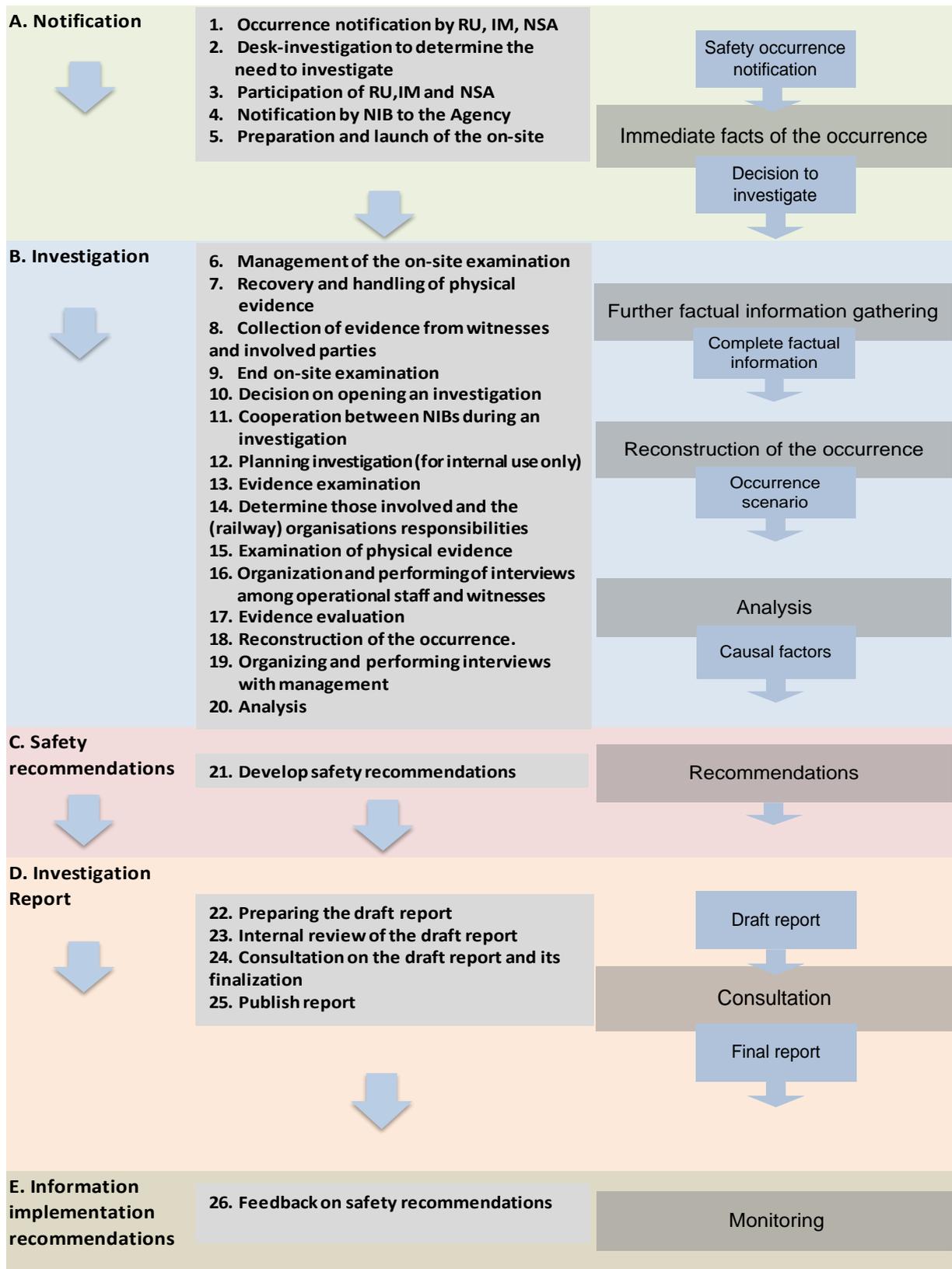
## **Annex III: Assessment protocols**

### **NIB Protocols**

The Protocols are available to the assessed NIB and to ERA, but are not attached to this report due to its extensive length.

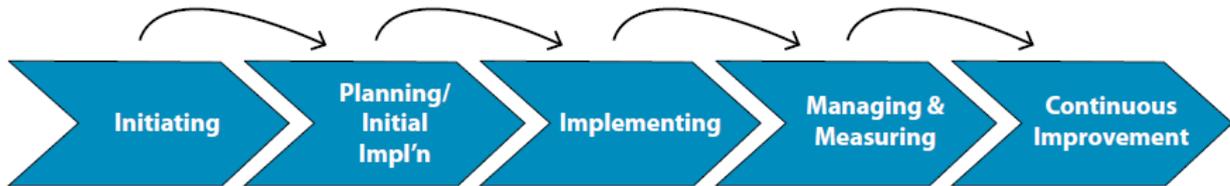
### Annex IV: Accident investigation process disaggregation

Following sub-processes and actions were considered within the overwhelming process of accident investigation.



## Annex V: Maturity levels

One of the main assessment tools is the protocols. These describe in detail the five parts of the investigation process, starting with the basic activities that have to be carried out, moving on to more advanced activities and finishing with an ideal situation.



The protocols have five different maturity levels:

### 1. Purpose achieved

The desired output is delivered without having identified desired inputs/ outputs, resource requirements, etc.

### 2. Performance managed

Requirements of inputs/ outputs are identified and reviewed, activities are planned and performance is monitored, responsibilities are defined, resources are identified and are made available.

### 3. Process established

A standard process is defined and implemented, the required competencies are identified, a personnel performing process is competent, process efficiency is monitored.

### 4. Process controlled

Measurement results are used to ensure that process performance supports defined business goals.

### 5. Process improved

Process improvement opportunities are identified based on innovation and good practice.

## Annex VI: List of conducted interviews

For each of the five parts of the accident investigation process (A-E), relevant interviewees and questions were identified in the pre-assessment phase.

The following persons were interviewed by the assessment team:

- INT 01 Director General (organisation, communication)
- INT 02 Head of Railway Department (organisation, roles, responsibilities, investigations)
- INT 03 Administration: Head of Department and Senior Executive Officer (human resources)
- INT 04 Administration: Head of Department (finance)
- INT 05 Fagstab: Senior Adviser I (human factors)
- INT 06 Fagstab: Senior Adviser II (quality adviser)
- INT 07 Fagstab: Senior Adviser III (general safety issues)
- INT 08 Fagstab: Senior Adviser IV (legal adviser)<sup>3</sup>
- INT 09 Administration: Head of Department and Adviser (archive)
- INT 10 Ministry of Transport and Communications: 5 senior staff (organisation, independence and budget)
- INT 11 Inspector of Accidents I (investigation I: investigation process)
- INT 12 Inspector of Accidents II (investigation II: investigation process)
- INT 13 Inspector of Accidents III (investigation III: investigation process)
- INT 14 Inspector of Accidents IV (investigation IV: investigation process)
- INT 15 Inspector of Accidents V (investigation V: investigation process)

---

<sup>3</sup> Interview by telephone

**Annex VII: List of documents used in the assessment (pre-assessment phase)**

<b><u>Document title (in English)</u></b>	<b><u>Document type</u></b>	<b><u>ID CODE</u></b>	<b><u>remark</u></b>
LEG-01-EN-Railway Investgiation Act	Legislation	LEG-01-EN	
LEG-02-EN-Railways Act	Legislation	LEG-02-EN	
LEG-03-EN-Railway Investgiations Rregulations	Legislation	LEG-03-EN	
LEG-04-EN-Notification and Reporting Regulations	Legislation	LEG-04-EN	
LEG-05-EN Directive_for_the_AIBN	Legislation	LEG-05-EN	
LEG-06-NO-Statsbudsjettet 2014 - tildelingsbrev	Assignment of budget 2014	LEG-06-EN	
LEG-07-NO-EN-FOR-2010-12-10-1568 Jernbaneforskriften	Legislation	LEG-07-NO-EN	Railway Regulation
LEG-08-NO-EN-FOR-2011-04-11-389 Safety management regulation	Legislation	LEG-08-NO-EN	Safety management Regulation
LEG-09-EN-Norway_Transposition Check of RSD_draft ED	Legislation	LEG-09-EN	
ANN-01-EN-AIBN_Annual_report_2011	Annual report	ANN-01-EN	
ANN-02-EN-Annual report 2012	Annual report	ANN-02-EN	
ACC-01-EN-2010-02P_eng_med_vedlegg[1]	Preliminary report	ACC-01-EN	
ACC-02-EN-2011-03_Alnabru-Sydhavna_engelsk[1]	Investigation report	ACC-02-EN	
ACC-03-NO-2013_08_Dal_st	Investigation report	ACC-03-NO	
ACC-04-EN-2013-01 Dombås stasjon eng[1]	Investigation report	ACC-04-EN	
ACC-05-EN-2013-02 Nykirke eng	Investigation report	ACC-05-EN	
ACC-06-NO-2013-07_Gardermoen stasjon[1]	Investigation report	ACC-06-NO	
ACC-07-NO-Jernbaneulykker	Number of registered accidents	ACC-07-NO	
ACC-07-EN-Jernbaneulykker	Number of registered accidents	ACC-07-EN	
ORG-01-NO-Structure of NIB organisation	Organisation	ORG-01-NO	
ORG-02-NO-Copy of email to RU-IM when investigation starts	Organisation	ORG-02-NO	
ORG-03-NO-H1-J - Veiledning for utrykning	Organisation	ORG-03-NO	
ORG-04-NO-H1-Varsel	Organisation	ORG-04-NO	

ORG-05-NO-H1-Loggføring	Organisation	ORG-05-NO	
ORG-06-NO-H1-Håndtering av media	Organisation	ORG-06-NO	
ORG-07-NO-H1-J - Beredskapsvakt	Organisation	ORG-07-NO	
ORG-08-NO-H2-Forundersøkelse	Organisation	ORG-08-NO	
ORG-09-NO-H2-Taushetserklæring	Organisation	ORG-09-NO	
ORG-10-NO-H2-J - Undersøkelsesleder	Organisation	ORG-10-NO	
ORG-11-NO-H2-J - Håndtering av taushetsbelagt informasjon	Organisation	ORG-11-NO	
ORG-12-NO-H3-J - Oppstartsmøte	Organisation	ORG-12-NO	
ORG-13-NO-H3-Leder på havaristed	Organisation	ORG-13-NO	
ORG-14-NO-H3-Pågående undersøkelser på nett, varsel om sikkerhetskritiske forhold og foreløpig rapport	Organisation	ORG-14-NO	
ORG-15-NO-H3-Undersøkelse	Organisation	ORG-15-NO	
ORG-16-NO-H3-J - Plassering av registrerende hastighetsmålerutstyr	Organisation	ORG-16-NO	
ORG-17-NO-H3-Utarbeidelse og kvalitetskontroll av sikkerhetstilrådnings	Organisation	ORG-17-NO	
ORG-18-NO-H3-Personlig utrykningsberedskap	Organisation	ORG-18-NO	
ORG-19-NO-H3-Intervju - gjennomføring og dokumentasjon	Organisation	ORG-19-NO	
ORG-20-NO-H3-Beslag og tilbakelevering av materiell og/eller dokumentasjon	Organisation	ORG-20-NO	
ORG-21-NO-H3-Heving av vrak	Organisation	ORG-21-NO	
ORG-22-NO-H3-Inn og -utfasing med politi, innsatsleder og Kripos	Organisation	ORG-22-NO	
ORG-23-NO-H3-Fotodokumentasjon, behandling og lagring av bilder	Organisation	ORG-23-NO	
ORG-24-NO-H3-Standard for skriving av rapporter	Organisation	ORG-24-NO	
ORG-25-NO-H3-Støtte til pårørende og overlevende	Organisation	ORG-25-NO	
ORG-26-NO-H3-Transport av vrakdeler og logger	Organisation	ORG-26-NO	
ORG-27-NO-H3-J - Produsering av standardbrev/rapport	Organisation	ORG-27-NO	
ORG-28-NO-H3-J - Notimark	Organisation	ORG-28-NO	

ORG-29-NO-H3-J - Behandling av registrator	Organisation	ORG-29-NO	
ORG-30-NO-H3-J - Deltakelse i utenlandske undersøkelser	Organisation	ORG-30-NO	
ORG-31-NO-H4-Høring	Organisation	ORG-31-NO	
ORG-32-NO-H4-J - Distribusjonsliste rapporter til eksternt gjennomsyn	Organisation	ORG-32-NO	
ORG-33-NO-H4-Høring - Intern og ekstern	Organisation	ORG-33-NO	
ORG-34-NO-H5-Avslutte	Organisation	ORG-34-NO	
ORG-35-NO-H5-Evaluering av undersøkelse	Organisation	ORG-35-NO	
ORG-36-NO-H5-Etterarbeid etter utgivelse av rapport	Organisation	ORG-36-NO	
ORG-37-NO-H5-Klargjøring av rapport og følgebrev	Organisation	ORG-37-NO	
ORG-38-NO-H5-J - Distribusjonsliste rapport	Organisation	ORG-38-NO	
ORG-39-NO-K1-Kvalitetshåndbok	Organisation	ORG-39-NO	
ORG-40-NO-S2-Metodisk undersøkelse	Organisation	ORG-40-NO	
ORG-41-NO-S2-Fagstab	Organisation	ORG-41-NO	
ORG-42-NO-S4-HMS	Organisation	ORG-42-NO	
ORG-43-NO-S4-Bruk av pustemasker	Organisation	ORG-43-NO	
ORG-44-NO-S6-IKT	Organisation	ORG-44-NO	
ORG-45-NO-S7-Utarbeidelse., implementering og vedlikehold av styrende dokumentasjon	Organisation	ORG-45-NO	
ORG-46-NO-S8-Arkiv	Organisation	ORG-46-NO	
ORG-47-NO-stillingsbeskrivelse havariinspektør rev01	Organisation	ORG-47-NO	
ORG-48-NO-Stillingsbeskrivelse JB avddir rev01	Organisation	ORG-48-NO	
OTH-01-NO-tertial jernbane	Report to the Ministry	OTH-01-NO	
OTH-01-EN-report to ministry - Machine translation-MR	Report to the Ministry	OTH-01-EN	
OTH-02-NO-Rapport fra internrevisjon JB april 2014	Internal assessment Rail Dept	OTH-02-NO	