



**ANNUAL REPORT 2010**  
Dutch Safety Board  
The Netherlands

## THE DUTCH SAFETY BOARD

The Dutch Safety Board was established to investigate and determine the causes or probable causes of individual incidents or categories of incidents in all sectors. The sole purpose of a Dutch Safety Board investigation is to prevent future accidents or incidents and, if outcomes give cause to do so, issue associated recommendations. The organisation consists of a board with five permanent members, a professional Bureau manned by investigators and support staff and a number of permanent committees. Guidance committees are set up to oversee specific investigations.

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## 1 INTRODUCTION TO THE INVESTIGATION BODY

### 1.1 Legal Basis

The Dutch Safety Board Act came into force on 1 February 2005, with the board officially being invested on 7 February of that year by the Minister of the Interior and Kingdom Relations.

The Board has specific and extensive competencies when it comes to the performance of its investigations, which competencies mean that it can compile and protect a lot of information that in some cases is unique. The Safety Investigation Board Act sets out safeguards for the protection of this information. Note that this information will not be passed on to third parties.

The competencies of the Dutch Safety Board's investigators are regulated in the Kingdom Act. The essence of the Act is that investigators must be given the greatest possible opportunity to acquire the relevant information. They are allowed to enter buildings in order to gather information, which may include radar images, tape recordings, documents and witness statements, and may take items with them for further investigation. In addition, the investigators can stipulate that wreckage left after an accident should not be removed from the scene straight away, and that during the initial phase of an investigation the accident site should as far as possible be left in its original state. Naturally, the victims' needs and the provision of aid will take precedence at all times, as do efforts to limit the damage done to equipment and the harm done to the environment. This is why the Board always works closely together with the emergency services, the police and the judicial authorities. Where possible, the Board's investigators will utilize information on an incident that has been compiled by the police and the judicial authorities. In contrast, the Dutch Safety Board's investigators do not give any information to the police or the judicial authorities.

In by no means all cases do the Dutch Safety Board's investigators go straight to the site of an incident. The various bodies involved will look at the facts based on their own remits. In this case, the Board may decide to refrain from launching an investigation until a later date, in which case it can then make use of the results of technical and other investigations already carried out by other parties. The Board will only follow this course of action if it is likely that its (later) investigation into the underlying causes will have added value.

### 1.2 Role and Aim

The Dutch Safety Board consists of a Board with five permanent members. Special guidance committees are set up for the purpose of conducting specific investigations. The Dutch Safety Board is supported by a bureau consisting of in total 35 investigators and 35 support staff.<sup>1</sup> The Safety Board conducts independent investigations into the causes of incidents. Its investigations look for any systematic safety-related shortcomings and it issues appropriate reports to the parties involved and to the general public. Accordingly, investigations constitute our primary process, with the product being a report in all cases. The key goal of this investigation is to establish the truth rather than to apportion blame.

The purpose of the Dutch Safety Board's work is to 'prevent incidents or to limit their after-effects'. Accordingly, the Board's investigation aims not only to uncover the actual causes of incidents but also – and in particular – to bring to light the underlying causes of the incident, so that any shortcomings in the applied system can be revealed. If the investigation reveals any systematic safety-related shortcomings then the Board can formulate recommendations so that these shortcomings can be put right. Any recommendations are usually addressed to the authorities but others may be intended for individuals, organizations or companies.

The Board would like to emphasize that it is no part of its remit to try to establish the blame, responsibility or liability attaching to any party. Information gathered during the course of an investigation – including statements provided by the Board, information that the Board has

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<sup>1</sup> For the Rail-sector: 4 investigators including management.

compiled, results of technical research and analyses and drafted documents (including the published report) – cannot be used as evidence in criminal, disciplinary or civil law proceedings. However, it is still possible that a (criminal) inquiry to apportion blame could be instituted, although any such inquiry would be quite separate from the Board's own investigation.

### 1.3 Organisation

The primary goal of the Board's work is to prevent future incidents and to limit the after-effects of the ones that do occur. The Board's investigation uncovers both the actual causes of incidents and the underlying causes, an approach intended to reveal any shortcomings in the system(s) being used. If systematic safety shortfalls are uncovered then the Board may publish recommendations to put right these shortcomings.

Note that for less serious incidents, there may be official bodies other than the Board – such as inspectorates and judicial authorities – who are carrying out their own investigation on the basis of their statutory remit. Such investigations are quite separate from any investigation the Board may be carrying out.

The Board's investigative competence does not cover public order disturbances, law enforcement by competent authorities or the conduct of the armed forces in armed conflicts or during operations to enforce international law (peace missions). Note, however, that this does not prevent the investigation by the Board of incidents that occur during armed conflicts or during peace missions but do not appear to have been caused by an act of war.

The investigation process itself can be broken down into a number of phases: after an incident, the first stage is always to set in motion an exploratory investigation – which will take no longer than a few months – in order to establish whether there is a systematic safety shortcoming worthy of a full investigation by the Board. Note too that the occurrence of a series of incidents may be reason enough to launch an investigation. In the next phase, a plan of action is drawn up. The investigation itself will result in a (draft) final report that after verification will be approved and published.

#### **Verification procedure**

The Dutch Safety Board has instituted a procedure during which the involved parties get the opportunity to give a reaction on the facts in the report. The aim of this procedure is to keep errors to a minimum and to give stakeholders the chance to make use of their right to hear and be heard. Under this procedure, copies of the draft report – which at this stage does not yet have its guiding foreword or recommendations – are given to the stakeholders with a request to submit any comments within four weeks. Any stakeholders located abroad – for instance in connection with an aviation incident – will be given 60 days for this. If the Board agrees with the comments then it will incorporate them into the definitive version of the report. If the Board feels that a comment does not necessitate changes to the report then this will be stated in the definitive report, usually in an appendix to the report that also contains the justification for the investigation.

Once the report has been published and sent to those who are the subject of its recommendations, these stakeholders will be given a maximum of six months (in the case of government institutions) or twelve months (in the case of private individuals) to respond. The response has to be sent to the minister responsible for the relevant operational sector. A copy of this response must be sent simultaneously to the chairman of the Dutch Safety Board and to the Minister of the Interior and Kingdom Relations (the Home Office). In this way, the appropriate ministry can monitor the follow-up action taken in the light of the recommendations. In contrast to its predecessor (the Transport Safety Board), the Dutch Safety Board now has the legal authority itself to check up on the actual action taken in the light of its recommendations.

#### **Assessment framework**

The Board has its own assessment framework alongside the existing legislation, regulations and specific standards for the branch of industry in question. Amongst other things, this framework sets out the way in which – in the Board's opinion – the parties involved should have acted in accordance with their own responsibilities in connection with an incident. The Board's framework is

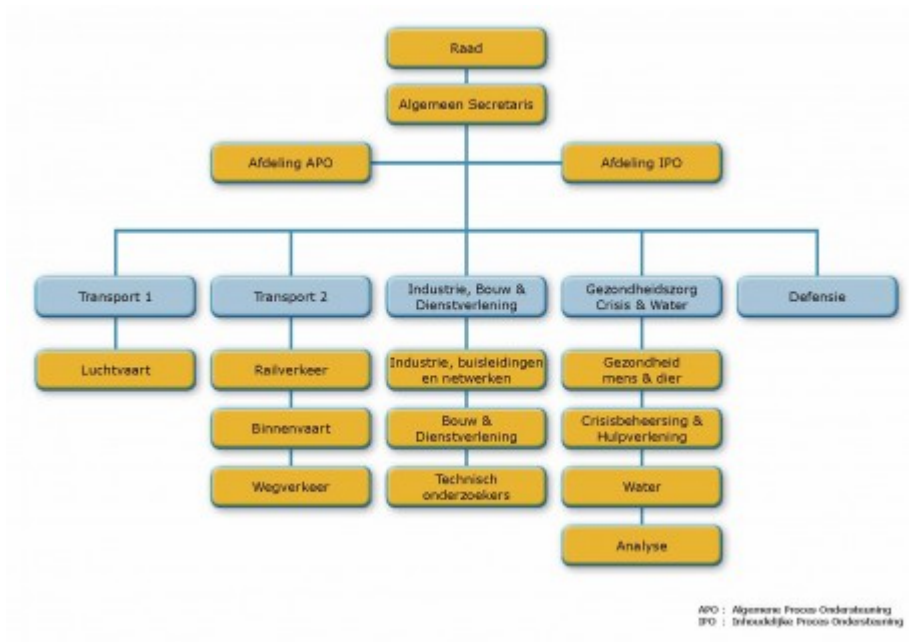
based on widely accepted and implemented standards and norms, as well as on national and international legislation and regulations.

The Kingdom Act recognizes a number of operational sectors where international obligations mean that in all cases the Board has to carry out an independent investigation. This applies in particular to the aviation industry, but is also true for rail transport and accidents involving the release of hazardous substances. As for the other investigation-sectors, the Board decides for itself which individual or series of incidents should be investigated, based on its own social responsibilities.

At the Safety Board, our current operational sectors are Aviation, Inland shipping, Maritime Transport, Railways, Road traffic, Defense, Health, Industry, pipelines and networks, Construction and service, Water and Crisis management.

The over all budget of the Safety Board in 2010 was € 12,5 mln.

### 1.4 Organisational flow



## 2 INVESTIGATION PROCESSES

### 2.1 Cases to be investigated

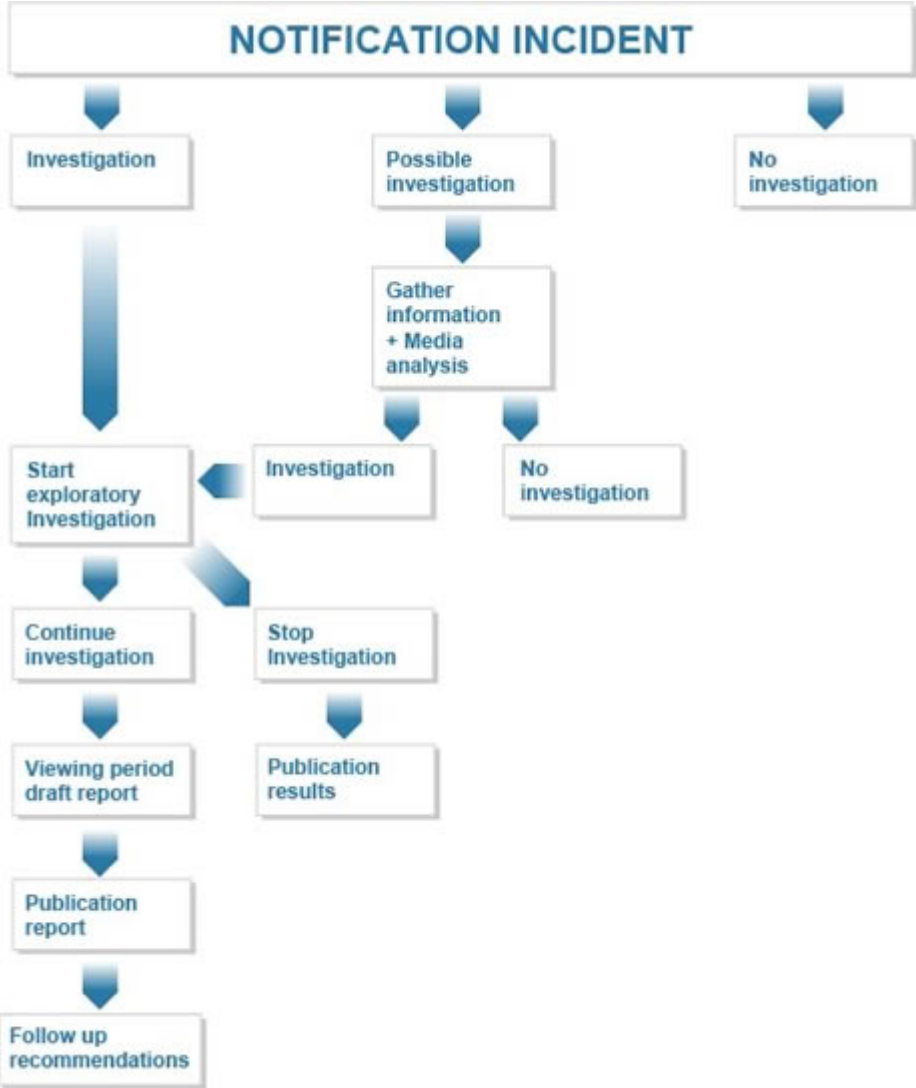
Cases to be investigated are accidents where the safety of passengers and staff members, level crossing safety, safety of infrastructure, safety of the rolling stock, safety of protective systems and external safety (the risk for neighbors in case of accidents with dangerous goods or serious derailments) is involved.

Mandatory are the 'serious accidents': collision or derailment of trains, at which at least one person dies or five or more persons get seriously injured or the damage can be instantly by the investigating organization valued at least at the amount of € 2 million.

### 2.2 Institutions involved in investigations

Investigations into direct causes of incidents are mainly performed by the involved parties and the National Safety Authority. The Safety Board itself is focused on the safety management systems that are implemented and used by the involved parties. Not the question 'How did the accident happen (technically)' but "why did it happen". Important focus is whether the involved parties have learned from former cases.

2.3 Investigation process or approach of the IB





### 3 INVESTIGATIONS

#### 3.1 Overview of investigations completed in 2010, identifying key trends

(summary in list or table, grouped by type of accident, identifying key trends in terms of investigations done).

| Type of accidents investigated in 2010 | Number of accidents | Number of victims |            | Damages in € (approximation) | Trends in relation to previous years |
|--|---------------------|-------------------|------------|------------------------------|--------------------------------------|
|  |                     | Deaths            | Ser. Injur |                              |                                      |
| Collisions                             |                     |                   |            |                              |                                      |
| Derailments                            | 1                   | 0                 | 0          | € 5 mln.                     |                                      |

#### 3.2 Investigations completed and commenced in 2019

| Date of occurrence | Title of the investigation (Occurrence type, location)    | Legal basis | Completed (date)      |
|--------------------|---|-------------|-----------------------|
| 22 november 2008   | Derailment freight train at Amsterdam-Muiderpoort station | iii         | Completed march 2010  |
| 25 September 2009  | Train collision Barendrecht                               | i           | Not completed in 2010 |
| 25 July 2010       | Train collision with an obstacle at Stavoren              | i           | Not completed in 2010 |

*Basis for investigation: i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).*

#### 3.3 Research studies (or Safety Studies) commissioned and completed in 2009

NA

#### 3.4 Summaries of investigations completed in 2009

The report on the Muiderpoort-derailment is published in march 2010.

##### *Abstract*

On November 2008 a goods train derailed at Amsterdam-Muiderpoort station. The train, comprised of an electric locomotive and twenty-five wagons loaded with chalk/quicklime, was on its way from Belgium to the steelworks in Beverwijk, the Netherlands. The train derailed at the moment that it was passing the Amsterdam-Muiderpoort emplacement. In the first instance the derailment was restricted to the front wheel set of the eleventh wagon. However, an escalation occurred about five hundred meters further on, when the other three wheel sets of this wagon derailed. This occurred as the wagon passed over a set of points. The eight following wagons then also derailed. Some of the derailed wagons came to rest on the adjacent track and four of the wagons fell on their side.

Although there were no casualties, a large amount of damage was caused to the rail infrastructure and the derailed wagons. The direct financial damage to the infrastructure and rolling stock amounted to almost three million euro's. The damage to the rail infrastructure caused an extensive and lengthy disruption of rail traffic in the Randstad conurbation that resulted in process damage of about 2 million euro's. Consequently, the total financial damage caused by the derailment amounted to almost five million euro's.

At the time of the derailment the adjacent tracks were being used by passenger trains. One passenger train passed the location of the accident shortly before the derailment: two other passenger trains had approached to a relatively short distance from the derailment but were able to stop in time.

The derailment was caused by an overheating axle box on the eleventh wagon that in turn caused an axle journal to break off. The overheating of the axle box was caused by the seizure of one of the two bearings in the axle box. The Board was unable to reach a definitive conclusion on the cause of the seizure of the bearing due to the damage caused by the overheating. However, it is clear that the bearing cage failed at an early stage of the seizure process. The nature of the damage also excludes a number of potential causes (such as an assembly error, lack of lubrication and overloading).

*Conclusions*

The Board observes that derailments such the Muiderpoort derailment occur about once a year and can have extremely serious consequences. Nevertheless, and without valid arguments, only limited use is made of the available technical safety nets. The Board also observes that it has not been demonstrated that the intended modification of the QuoVadis system will reduce the derailment risks to ALARP level. The Board is of the opinion that this, in view of the severity of the potential consequences, is unacceptable.

The Board concludes that the standpoint of the rail companies and the government is indicative of a too limited opinion of the relevant duties. The rail companies' joint approach to safety risks, in particular, is given insufficient shape. The Board is of the opinion that the rail companies need to further develop their safety management, in particular with respect to the preparation of inventories and analyses of the safety risks, and the assessment of control measures. In the Board's opinion the government has failed to take effective action to close (or arrange for the closure of) the resultant safety gap. The Board expects the Ministry of Transport, Public Works and Water Management to make arrangements for the necessary direction, formulate specific targets for the derailment risk and enforce the achievement of those targets.

The Board has the impression that the aforementioned standpoint of the rail companies and the government is in part influenced by the absence of serious casualties in accidents of this nature for many years. However, the absence of serious casualties - even during the course of many years – is not a valid criterion for safety levels. In complex processes such as rail traffic the severity and extent of the potential consequences can be evaluated in an appropriate manner solely on the basis of both a thorough inventory/analysis of the safety risks and a structural assessment of the available control measures. In the absence of insufficient attention to both of these issues the reduction of risks will be assigned the appropriate priority only in response to a major accident or a series of serious accidents.

**3.5 Comment and introduction or background to the investigations**

(E.g. commenced but not followed through for specific reasons, issues or problems, resource issues etc. Some explanatory notes or comments if the IB feels it would be helpful to the reader to understand better the general or specific issues of context around investigations.)

| Date of occurrence | Title of the investigation (Occurrence type, location) | Legal basis | Reason of non following or suspension of investigations | Who, why, when (decision) |
|--------------------|--|-------------|---|---------------------------|
| NA                 |  |             |   |                           |
|                    |  |             |   |                           |

*Basis for investigation: i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).*

### 3.6 Accidents and incidents investigated during last five years (in 2006–2010)

| Accidents investigated               |   | 2006           | 2007 | 2008 | 2009 | 2010 | TOT |
|--------------------------------------|---|----------------|------|------|------|------|-----|
| Serious accidents<br>(Art 19, 1 + 2) | Train collision                           |                |      |      | 1    |      | 1   |
|                                      | Train collision with an obstacle          |                |      |      |      | 1    | 1   |
|                                      | Train derailment                          | 1 <sup>2</sup> |      | 1    |      |      | 2   |
|                                      | Level-crossing accident                   |                |      |      |      |      | 0   |
|                                      | Accident to person caused by RS in motion |                |      |      |      |      | 0   |
|                                      | Fire in rolling stock                     |                |      |      |      |      | 0   |
|                                      | Involving dangerous goods                 |                |      |      |      |      | 0   |
| Other accidents<br>(Art 21.6)        | Train collision                           |                |      |      |      |      | 0   |
|                                      | Train collision with an obstacle          |                |      |      |      |      | 0   |
|                                      | Train derailment                          |                |      |      |      |      | 0   |
|                                      | Level-crossing accident                   |                |      |      |      |      | 0   |
|                                      | Accident to person caused by RS in motion |                |      |      |      |      | 0   |
|                                      | Fire in rolling stock                     |                |      |      |      |      | 0   |
|                                      | Involving dangerous goods                 |                |      |      |      |      | 0   |
| Incidents                            |   |                |      |      |      |      | 0   |
| TOTAL                                |   | 1              |      | 1    | 1    | 1    | 4   |

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<sup>2</sup> This concerns one investigation into several light rail derailments.

## 4 RECOMMENDATIONS

### 4.1 Short review and presentation of recommendations

In the past six years, the Dutch Safety Board published seven reports in the field of rail transport. All these reports included recommendations. In total 29 recommendations were made and thus far 26 reactions were received. About half of the recommendations were directed to the Dutch Ministry of Transport, Public Works and Water Management or its Inspectorate. The other half were directed to a wide variety of other organizations, including for example ProRail (the infrastructure manager of the Dutch national railway) and Dutch Railways (the principal passenger railway operating company in the Netherlands).

Implementation of recommendations during 2005 –2010

| Recommendations issued |                | Recommendation implementation status |              |             |             |                       |              |
|------------------------|----------------|--------------------------------------|--------------|-------------|-------------|-----------------------|--------------|
|                        |                | Implemented                          |              | In progress |             | Not to be implemented |              |
| Year                   | No.            | No.                                  | %            | No.         | %           | No.                   | %            |
| 2005                   | 14             | 12                                   | 85.7%        |             |             | 2                     | 14.3%        |
| 2006                   | 4              | 2                                    | 50%          | 1           | 25%         | 1                     | 25%          |
| 2007                   | 3              | 3                                    | 100%         | -           | -           |                       |              |
| 2008                   | 2              | 2                                    | 100%         |             |             |                       |              |
| 2009                   | 0              |                                      |              |             |             |                       |              |
| 2010                   | 6 <sup>3</sup> |                                      |              |             |             |                       |              |
| <b>TOTAL</b>           | <b>29</b>      | <b>19</b>                            | <b>65,6%</b> | <b>1</b>    | <b>3,4%</b> | <b>3</b>              | <b>10,3%</b> |

### 4.2 Recommendations 2010

In 2010 the following recommendations were issued, in the report on the Muiderpoort-derailment:

1. *To the Minister of Transport, Public Works and Water Management:*
  - a) Call the rail companies to account, in accordance with the Railways Act, for their individual and shared responsibility for rail traffic safety. This can be achieved by effective supervision and stringent enforcement of their duty of care for safety. In addition, require the rail companies to demonstrate that they have reduced the safety risks to ALARP level.
  - b) Achieve adequate control of the goods-train derailment risk by:
    - arranging for the direction of the consultations and the decision-making on the implementation of control measures;
    - imposing specific targets for the reduction of the derailment risk.
2. *To Railion, ProRail and NS Reizigers:*
  - a) Extend the safety management to the risks to the relevant company's operations that are caused by other companies and/or require a joint approach.
  - b) Make sure that the available technical options for defect and derailment detection are used to reduce the goods train derailment risk to ALARP level.
3. *To Xpedys:*

Evaluate the periodic maintenance of the axle boxes of the series of wagons involved in the Muiderpoort derailment, with due regard for the chipping damage encountered in one of the bearings of the derailed wagons.

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<sup>3</sup> The Dutch Safety Board has not yet received reactions of all addressed parties and therefore was not able to include information on the recommendation implementation status. This information will be included in the Annual report 2011.

4. *To Railion and ProRail:*

Carry out an investigation of the current-flow damage to the axle box bearings observed with the wagons involved in the Muiderpoort derailment and make sure that the necessary measures are implemented to prevent this form of damage.