

ANNUAL REPORT 2012

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 three 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 40 investigators and 35 support staff.¹ 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

¹ 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 2012 was € 11,7 mln.

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 \notin 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 2012, 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 2012	Number of accidents	Number of Deaths	victims Ser.Injur	Damages in € (approximation)	Trends in relation to previous years
Collisions	1	1	Appr. 24	30.000.000	None
Derailments					

3.2 Investigations completed and commenced in 2012

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis	Completed (date)	
April 13, 2012	Train collision Maasvlakte	I	March 5, 2013	
April 21,	Train collision Amsterdam	I	December 11, 2012	
2012	Westerpark			

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 2012

NA

3.4 Summaries of investigations completed in 2012

Train collision Amsterdam Westerpark (April 21, 2012)

On 21 April 2012 a train collision occurred in Amsterdam, near Westerpark. A sprinter and an intercity train collided head-on. At least 190 out of at least 425 occupants were injured, of whom 24 were found to have sustained serious injuries. A day after the accident one of the seriously injured passengers died as a result of the injuries suffered.

The collision occurred as a result of the sprinter driving past a red signal. The driver of the sprinter had made an error in observing the red signal and thought that the signal had displayed yellow. The train driver subsequently failed to notice that he was passing the red signal because he had been distracted.

According to the Safety Board this was not the sole cause of the collision. Other circumstances also played a role. Engineering work was being carried out on the railway that day. Therefore, the timetable for that day had been adjusted and both trains were required to use the same railway track. In addition around that point in time a goods train had deviated from the timetable, as a result of which the approaching intercity train was unable to clear the railway track for the sprinter in time. The sprinter was therefore required to wait at a red signal until the intercity train had passed. Not only the train driver did not notice that the sprinter had driven past a red signal, but traffic control and the safety systems similarly did not do so. The train driver therefore was not given any warning that he had passed a red signal, and the train was also not automatically brought to a standstill.

The causes of the train collision at Amsterdam Westerpark are not unique. The investigation shows that no one consciously acted contrary to the usual operating procedure. At the location and time of the collision the available technical systems were no different from those at many other locations in the railway network. This means that measures must be in place to ultimately prevent a collision from occurring as a result of adjusted timetables, delays and human errors. The Safety Board investigated the manner in which the parties involved controlled the risk of such a collision. The Safety Board also investigated what efforts the parties have undertaken to reduce the risk of injury among passengers and personnel as much as possible in the event of a collision. This summary contains the main conclusions drawn from the investigation.

The Safety Board concludes that Dutch Railways (Nederlandse Spoorwegen – NS) and ProRail (the infrastructure manager) can increase their efforts to prevent red signals from occurring. NS had adjusted the schedule on account of engineering work. The schedule was tight and conflicted with the planning standards specified by ProRail, the infrastructure manager. This escaped ProRail's notice because ProRail relied on NS to adhere to the standard. This made the schedule unnecessarily vulnerable to disruption on the day of the accident and in practice gave rise to red signals.

ProRail, as the party responsible for traffic control, attaches low priority to ensuring that train running schedules are kept free of conflict (i.e. preventing yellow and red signals) until the time trains start operating. If a conflict arises, it is not detected by the systems. Whether solving conflicts is given priority, currently depends on the individual signaller (and his workload at that particular point in time).

NS does not guarantee that after a train driver has passed a yellow signal, he will fully focus his attention on the subsequent red signal. And there is no technical device to alert the train driver that he is approaching a red signal, or to warn him immediately he has passed a red signal. In the past a support system was used to assist train drivers when approaching a red signal but it did not function sufficiently. Rather than improving this system, it was abolished.

ProRail does not guarantee that the options available are deployed to help prevent a train from driving past a red signal or to help limit the ensuing consequences. The signal was not fitted with Automatic Train Protection – Improved Version (ATB-VV), which automatically brings a train to a standstill at a red signal. Even a signaller does not have any adequate devices at his disposal to alert him to the fact that a train has driven past a red signal. Such a device was used in the past, but that system also failed to function sufficiently and was abolished. It has not been replaced by an improved functionality to date.

During this investigation, it was the first time the Safety Board looked into the question of how the consequences for the occupants could have been limited. The Safety Board has also created a data set (for the purpose of additional investigations by manufacturers and other relevant parties) that provides information about the various aspects of the collision (collision dynamics, damage to the structure and interior of both trains and injury).

Even though the trains were involved in a forceful collision, they did not derail. No occupants became trapped. The injuries sustained by the occupants were mainly caused because they came into contact with the interior of the trains (such as seats, tables, glass partition walls and partition doors) and by coming into physical contact with other passengers. However, the cabin of the intercity train sustained severe deformation because, unlike the sprinter, the intercity train is not fitted with crash absorbers. Moreover the crash absorbers on the sprinter only had a limited effect because it collided with another train type.

It emerged during the investigation that when purchasing or overhauling trains, NS restricts itself to the concrete, minimum technical crashworthiness requirements prescribed by law. The aspect of interior crashworthiness was not considered when purchasing new trains. The railway undertaking also omitted to examine whether enhanced insights into crashworthiness gave cause to modify the structure of trains, for instance by ensuring that trains are 'compatible' in the event of a collision. The Safety Board concludes that NS has thus failed to perform its statutory duty of care for safety. The investigation shows that it has taken longer than possible and advisable to improve the crashworthiness of passenger trains for both passengers and train personnel. The improvement efforts were affected as a result of the Minister of Infrastructure and the Environment not having incorporated the enhanced insights into interior crashworthiness in the passenger train admission requirements. The current crashworthiness regulations therefore do not match the current state of the art.

The law requires that railway undertakings themselves determine what measures are appropriate to ensure they adequately control their safety risks. The investigation brought to light that they do not always do so in a manner enabling third-party review. And in day-to-day practice, this is not the focus of government supervision as performed by the Environmental and Transport Inspectorate.

3.5 Comment and introduction or background to the investigations

(E.g. commenced but not followed trough 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 2008–2012)

Accidents investigated		2008	2009	2010	2011	2012	TOT
ıts	Train collision		1			2	3
	Train collision with an obstacle			1			1
2) der	Train derailment	1					1
+ []	Level-crossing accident						0
, 1 1	Accident to person caused by						0
19	RS in motion						
i t	Fire in rolling stock						0
Se (A	Involving dangerous goods						0
Other accidents (Art 21.6)	Train collision						0
	Train collision with an obstacle						0
	Train derailment						0
	Level-crossing accident						0
	Accident to person caused by						0
	RS in motion						
	Fire in rolling stock						0
	Involving dangerous goods						0
Incide	Incidents						0
TOTAL		1	1	1		2	5

4 **RECOMMENDATIONS**

4.1 Short review and presentation of recommendations

In the past seven years, the Dutch Safety Board published eight reports in the field of rail transport. All these reports included recommendations. In total 31 recommendations were made and 17 reactions were received. At the time of writing this annual report, we had not yet received reactions to the eight recommendations issued in the report on the train collision Amsterdam Westerpark which was published in December 2012. 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 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).

Recomme	ndations	Recommendation implementation status					
issued		Implen	nented	In progress Not to be impl		o be implemented	
Year	No.	No.	%	No.	%	No.	%
2006	4	2	50%	1	25%	1	25%
2007	3	3	100%				
2008	2	2	100%				
2009	0						
2010	6	4	66.7%	1	16.7%	1	16.7%
2011	8	6	75%			$1^{[1]}$	25%
2012	8						
TOTAL	31	17	78.3%	2	5.4%	6	16.2%

Implementation of recommendations during 2006 - 2012

4.2 Recommendations 2012

In 2012 the following 8 recommendations were issued in the report on the train collision Amsterdam Westerpark (April 21, 2012)

Recommendation 1
 NS: Ensure conflict-free scheduling, applying as a minimum requirement consistent compliance with the ProRail planning standards. In addition, perform systematic risk analyses to formulate measures - exceeding those set out in the planning standards – to ensure the safest possible schedule.

• Recommendation 2

ProRail: ensure rail traffic is kept free of conflict during both scheduling and rail operations. This includes reviewing whether the schedule provided by the transport operators meets the planning standards, as well as identifying and resolving conflicts arising during rail operations in a reliable manner.

• *Recommendation 3* Minister of, and State Secretary for Infrastructure and the Environment:Focus on continuously reducing the number of conflicts during the actual operation of the timetable.

^[1] In 2011 one of the addressed parties did not respond to the recommendation issued by the Dutch Safety Board. We therefore assumed that this recommendation is not to be implemented.

- Recommendation 4
 - NS: Prevent train drivers from passing a red signal whilst not noticing this, by:
 - a. implementing a system that issues a warning immediately when a train approaches or passes a red signal;
 - b. employing more specific procedures in respect of a train driver's conduct after passing a yellow signal.
- Recommendation 5

ProRail: Ensure measures are in place:

- a. that warn signallers if a train drives past a red signal;
- b. to promptly switch signals to red for approaching or overtaking trains, if a train has driven passed a red signal.
- Recommendation 6

NS: Incorporate the crashworthiness of rolling stock in the safety management system, such that it is taken into account when considering the purchase or modification of trains, and to ensure that reasonably practicable improvements regarding safety will be implemented.

• Recommendation 7

Minister of, and State Secretary for Infrastructure and the Environment

- a. Incorporate the knowledge that is now available on interior crashworthiness in the passenger train admission requirements.
- b. At the same time expedite the further implementation of European regulations in this area.
- c. Ensure that re-ordered trains meet the requirements for newly built trains prevailing at the time the order is placed.
- Recommendation 8

Bombardier / Siemens: Perform an additional investigation (in respect of both the train structure and the interior) and incorporate the lessons learned from this accident in future train designs.