

The value of independent investigations within integrated transport safety systems

Wartość niezależnych dochodzeń w ramach zintegrowanych systemów bezpieczeństwa

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Abstract

The importance of independent investigations into the causes of transport accidents is still underestimated in Poland in the same way as the right of society to adequate information on safety. Meanwhile, international experience shows that they can effectively improve safety by reducing the costs, enhancing the transfer of safety lessons between different modes of transport, facilitating the advancement of new and innovative investigation techniques and by increasing safety levels through the recommendations coming from investigations and safety research.

Słowa kluczowe: niezależne dochodzenie, przyczyna wypadków, badania nad bezpieczeństwem

Abstrakt

Znaczenie niezależnych dochodzeń w sprawie przyczyn wypadków transportowych jest wciąż w Polsce bagatelizowane, tak samo, jak prawo społeczeństwa do odpowiednich informacji dotyczących bezpieczeństwa. Tymczasem międzynarodowe doświadczenie pokazuje, że mogą one skutecznie poprawić bezpieczeństwo poprzez obniżenie kosztów, zwiększenie przepływu informacji o bezpieczeństwie między różnymi środkami transportu, ułatwiając rozwój nowych i innowacyjnych technik dochodzeniowych oraz zwiększenie poziomu bezpieczeństwa poprzez zalecenia wynikające z dochodzeń i badań nad bezpieczeństwem.

Introduction

On 10 May 2007 the Polish Minister of Science appointed Gdansk University of Technology the main contractor of a research project entitled: “Integrated System of Transport Safety – ZEUS”. To carry out this project a Consortium, which represents 4 branches of transport was established. The members of the Consortium are the Gdańsk University of Technology (road transport) – prof. R. Krystek – the project leader, Silesian University of Technology (rail transport) – prof. M. Sitarz, Air Force Institute of Technology (air transport) – prof. J. Żurek and Maritime Academy in Szczecin (water transport) – prof. S. Gućma.

The main objective of the project is to build a model of an integrated system of transport safety management. Integrated means harmonised laws, risk management, traffic control including an information system and consistent accident investigation methods when a transport disaster occurs. This is in line with EU policy and the final recommendations of the SafetyNET [1] project supporting efforts aimed at harmonising traffic accident investigation procedures in all member states [1]. Poland aims to be among the several countries worldwide which have built and are operating integrated systems of transport safety and thereby contribute to the European system of transport safety.

One of the crucial elements of such a system is an independent accident investigation system. After almost half a century of the transport safety system in the USA, in which the NTSB (National Transportation Safety Board) plays the key role, Americans are convinced that the prerequisite for safety improvement is the creation of an independent organization whose goal is to investigate causes and circumstances of incidents, accidents and disasters within all five modes of transport. Independence is here of such great value because an autonomous organization is only interested in explaining the causes and circumstances of the unsafe event and is designed neither to determine the guilt nor to find the perpetrator of the event. Only by creating laws that protect a person from criminal responsibility if they voluntarily explain the real causes of an accident, we can find out the truth, what has led to the accident and why. These responses provide a basis for the formulation of recommendations or instructions about what should be done or changed in the system to avoid similar events in the future. This is the goal of independent investigations [2].

Polish efforts to develop the project “Integrated Transport Safety System”, based mostly on the best American, Dutch and Swedish experiences demonstrate the growing interest in this solution within EU countries. Countries which have developed independent systems of safety of transport are now the safest in terms of the number of accidents and victims in the whole world (Fig. 1).

This is why recent years have seen a growing debate about the necessity of establishing a European Transport Safety Board – a body for independent investigations. Although the idea is quite new, progress in the talks at the EU level shows that the establishment of this kind of organization will unfortunately be a long process. It is not easy to win the support of politicians for an entirely new idea especially one that they regard with some distrust.

Establishing the blame vs. independent investigations

There are many reasons why a society’s right to independent investigations is of great value. According to Peter van Vollenhoven, chairman of Dutch Safety Board, whose experience goes back 20 years they are the only way to establish exactly what has happened. They can put an end to any public concern that may have arisen in the after-effects of the accident. They can help the victims and their families come to terms with their suffering. They can teach lessons for the future to prevent such accidents from happening again. Vollenhoven strongly emphasizes that independent investigations make our actions transparent which helps democracy to function properly. This is why this approach can be of great significance to the society at large. If people have the right to independent investigations, and this right is a law, the independent investigations can and will be carried out [4].

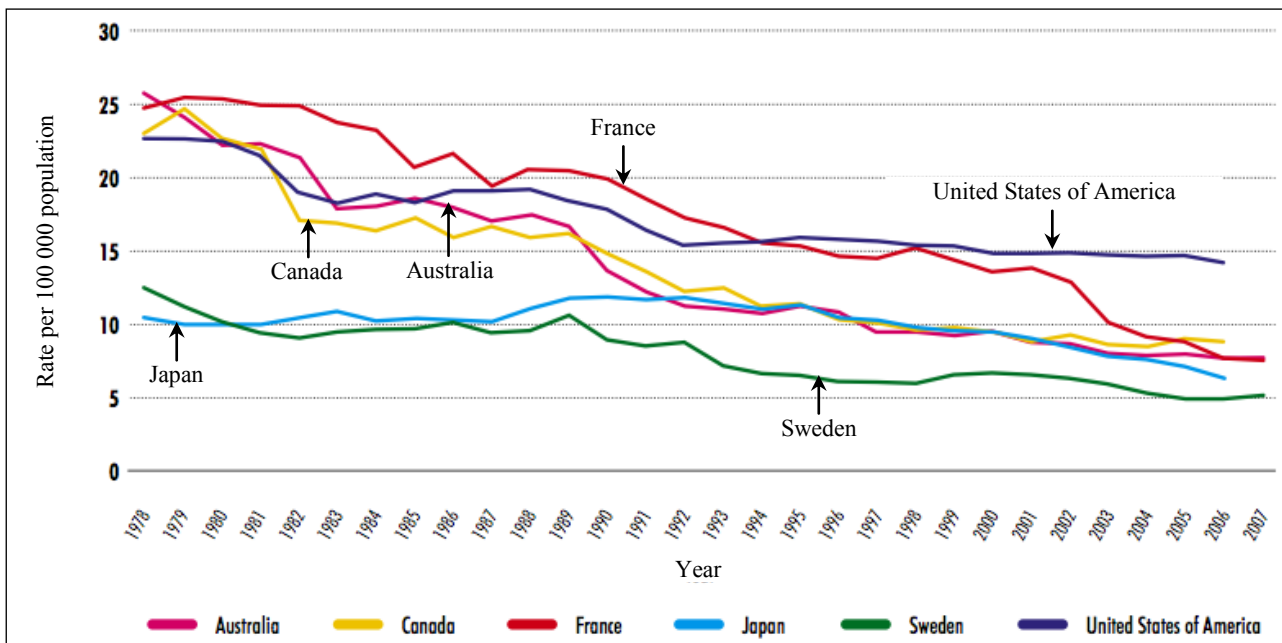


Fig. 1. Trends in road traffic fatality rates in selected countries [3]

Rys. 1. Współczynniki umieralności w ruchu drogowym w wybranych krajach [3]

It is interesting to look back at the beginnings of independent investigations to see what exactly were the primary reasons for introducing independent investigations into the causes of accidents and incidents. The reasons were quite natural – the parties involved in the investigations began to realize that the criminal law inquiry that attempted to find out who was to blame for an accident was not the right instrument to find out just what exactly had happened. If lessons were to be learned for the future, and steps were to be taken to prevent the same thing from happening again, it was absolutely essential to find out what had gone wrong and what had led to the disaster or accident.

The investigations into blame were not sufficient anymore. Another type of investigation was thus needed: an investigation what we now call in-depth investigation. It was a method that first gained international acceptance in investigations of aircraft accidents. Annex 13 to the ICAO convention was adopted in 1951. It specified that an investigation into the causes of an accident had to be held separately from the investigation into the party or parties to blame. But they were not “independent” at that time yet. The intention was simply to create a strict division between the two types of investigation. Responsibility for carrying out these investigations into the causes was placed in the hands of the national aviation inspectorates. It took about thirty years, from 1951 to the eighties, before the ICAO came to the conclusion that these investigations should be carried out independently. In 1994, the European Union issued Directive 94/56, which went a step further, specifying that accident investigations should be carried out by a permanent, independent organization.

There is one more essential difference between the two types of investigation. Independent investigation not only means the investigations of accidents. Of very high importance for safety are incidents investigations or studies. In the past, investigations tended to centre on accidents. However, since prevention is better than cure, safety boards are now increasingly turning their attention to incident studies. The reason is that the criminal justice authorities take no action when such incidents occur. But they are of vital importance to independent investigations and to the lessons learned for the future.

New legal framework for independent investigations

If the truth is to be established, and if an independent investigation is to be successful, statutory

guarantees are needed to ensure that witnesses are free to tell the truth. It is impossible to carry out an independent investigation if the government simply puts together or appoints a committee to do so. To be successful, independent investigations need to be imposed by law, with regulations to govern the powers of the investigators. There need to be provisions giving the investigation board the power to decide which statements and which of the underlying reports can be made public. And the law needs also to specify that the final report cannot be used as evidence in criminal or civil law proceedings. This is the main reason for a completely different legal framework for the independent investigation. Total independence will, of course, never be achieved.

The board has to be appointed, and funding will have to be provided by government. Existing safety boards have their own budgets, but they do not have the kind of money needed to salvage an airplane that has crashed into the sea, for example. However, both appointments and funding are matters that can be arranged in a transparent way.

Transparency is such an important issue, because safety has long been a very complex subject, in which many – often conflicting interests – play a part. Very often in the past, safety has taken a back seat when other interests come into play – economic interests in particular. Indeed, in some cases, the parties involved stand to gain if the true causes of an accident are never revealed.

Value of recommendations

Key to independent investigations are the reports, recommendations and guidelines that they produce and how they can improve the existing safety systems (Fig. 2). Experience gathered over the years shows that neither administrative nor penal sanctions can put a stop to inadequate (dangerous) behaviour within the transport system and other areas of human activity. This is because the purpose of the measures is to identify and punish the guilty party. What they do not have are mechanisms to put the experience from accidents to work and improve the elements of the system (to use lessons learned). Independent accident investigation with its systems of recommendations and guidelines addressed to all stakeholders can make structural change happen in the transport system.

An independent investigation can only be successful if the investigators, and thus the report they produce, are of the highest standard. The accepted procedure is for a confidential draft report – sometimes complete with recommendations – to be sent

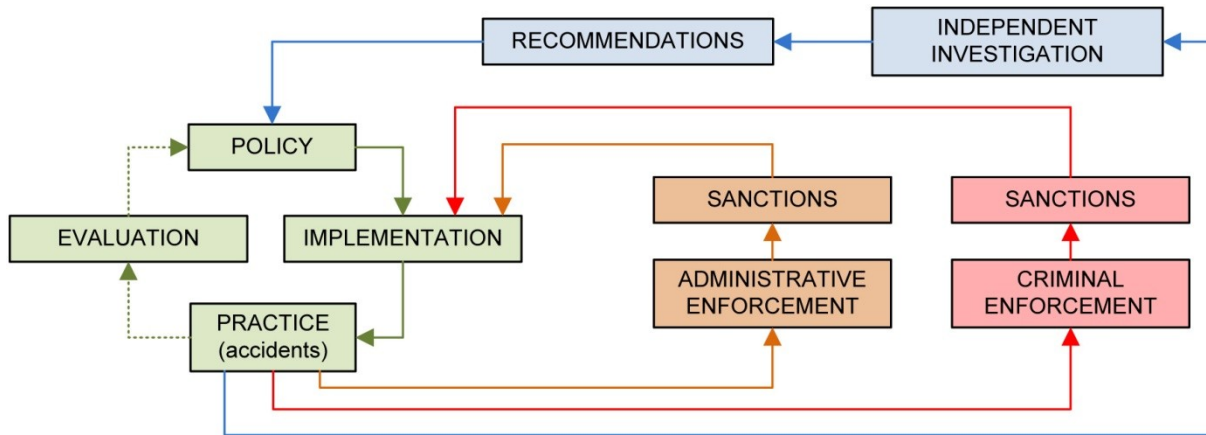


Fig. 2. The position of independent investigation within the safety system [5]
 Rys. 2. Pozycja niezależnego dochodzenia w systemie bezpieczeństwa [5]

to all parties concerned for their comments. The board approves the final report. With this method, consensus can be reached on what exactly happened. But apart from an analysis of the accident, the report also contains recommendations. These recommendations are addressed directly to the parties concerned and their names are included. What then happens with the recommendations depends on the particular country’s law. In the Netherlands for example, all these parties are “legally obliged” to respond within a year of the report’s publication. In America, only the Department of Transportation is obliged to report back, but then within ninety days. This is also the case in Canada. Other parties respond on a voluntary basis. Because the alternative is that the National Transportation Safety Board’s place the recommendations on a Most Wanted list (with the names of the people involved) [4].

Thanks to this procedure, the National Transportation Safety Board in America has issued 12 000 thousand recommendations on ways of improving safety in the forty years since it was established, eighty percent of them have been followed up [6].

Sectoral or multimodal boards?

Another issue that often gives rise to debate on integrated transport safety systems is the question of whether independent investigations should be organised sector by sector, or on a multimodal basis. Are we talking about an Aviation Safety Board, a Railroad Accident Investigation Board or a multi-modal Transport Safety Board?

The conclusion from an analysis of the main features of transport safety organisations from different countries is that there is a general tendency to integrate sectoral commissions. This is proved right by the positive experience of the most economically developed countries such as the US, Canada, Australia and New Zealand and European countries such as the Netherlands, Norway, Finland and Sweden [7]. Table 1 gives the scopes covered by national commissions investigating road, rail, aviation and water transport accidents. The column “Others” covers non-transport accidents.

Independent commissions investigating transport safety issues can be grouped into four groups:

- I. Commissions investigating all transport accidents and accidents in other sectors of

Table 1. Scope of work of national accident examination bodies across the modes
 Tabela 1. Zakres prac krajowych organów badania wypadków z podziałem na tryby

Country	Road	Railway	Air	Water	Pipes	Multi	Other
The Netherlands	DSB	DSB	DSB	DSB	DSB	DSB	DSB
Finland	FAIB	FAIB	FAIB	FAIB	FAIB	FAIB	FAIB
Sweden	SAIB	SAIB	SAIB	SAIB	SAIB	SAIB	SAIB
USA	NTSB	NTSB	NTSB	NTSB	NTSB	NTSB	–
Canada	TC	CTSB	CTSB	CTSB	CTSB	CTSB	–
Australia	ATSB*	ATSB	ATSB	ATSB	–	ATSB	–
New Zealand	TAIC**	TAIC	TAIC	TAIC	TAIC	TAIC	–
Norway	AIBN	AIBN	AIBN	AIBN	–	–	–

* road accident investigations are placed in a separate department
 ** TAIC conducts studies of traffic accidents only in case of conflict with other transport modes

economy involving substantial financial losses and substantial numbers of people killed and severely injured;

- II. Commissions investigating all accidents at least in road, rail, air and water transport;
- III. Commissions investigating transport accidents except road transport;
- IV. Sectoral commissions.

Group I includes European commissions such as the DSB in the Netherlands, FAIB in Finland, SAIB in Sweden and AIBN in Norway. Group II includes the US's NTSB and group III includes the rest: CTSB in Canada, TAIC in New Zealand and ATSB in Australia.

It is interesting that European countries with commissions falling under groups I and II are the world's leaders in road safety (Tab. 2). What this suggests is that they approach transport risk differently with the understanding that it may cause death and injury. Perhaps this is why political is easier to obtain in these countries to tackle the problems of transport risks. It is worth noticing that the three countries: the Netherlands, Sweden and Finland have extended the scopes of their accident and disaster investigation commissions to include mining, construction, chemicals, nuclear facilities medicine and pharmaceuticals.

Table 2. Road accidents by classes
Tabela 2. Wypadki drogowe według klas

Country	Fatalities / 100 000 population	Classification of transport accident investigation boards
The Netherlands	4.3	First
Sweden	5.2	First
Norway	5.2	Second
Finland	7.2	First
Australia	7.7	Third
Canada	9.2	Third
New Zealand	10.0	Third
USA	14.2	Second
Poland	14.7	Fourth

Experience shows that, at the start, the various transport sectors are extremely reluctant to work together in a multi-modal board. There is a lot of skepticism like "what has aviation to do with shipping, or shipping with railways" [8]. Most multi-modal safety boards have been set up under pressure from parliament – usually through motions submitted by individual members.

According to experiences of a number of safety boards the disadvantage of setting up them individually is that separate boards may be too poorly

equipped to do their job properly. Investigators might find their counterparts do not take them seriously from major multinational organizations, for instance. The key to high-quality investigations is to join forces, to work together, both nationally and internationally. And there is not one multi-modal transport safety board that would want to split up into five separate boards. The international trend is now to set up multi-modal boards.

The final point is: should Europe be aiming for national boards, or a single European board? This is a question that hasn't been answered clearly yet. Nevertheless, P. van Vollenhoven states that for now the first aim should be to set up national boards, with a European umbrella organization in which they work closely together. An umbrella organization is essential, to provide a European view of the various recommendations the boards issue, and to identify where the European Commission needs to take action. At a later stage we could possibly merge into a single European Safety Board, comparable with the National Transportation Safety Board in USA [9].

Examples of independent investigations

The beginnings of independent transport safety research go back to 1967 when President of the United States Lyndon B. Johnson launched the mission to establish an independent institution, integrating research on road, railway, air, water and pipeline transport into one system. To this day it remains the best example of a structure, which has all the characteristics of an independent, impartial and fully self-sufficient organization to investigate the causes of accidents in transport. Because of the size of the country in which it operates it is also the most complex structure. Then, either in keeping with requirements of legislation signed by the proposed conventions and agreements, or as the result of social pressure and political will other countries in the world were appointing the investigation boards of different structures, scope of competences and ways of funding.

You can say that their development was as follows: first came the single mode boards as independent accident investigation bodies in particular transport branches. Then began the process of combining. Most of the mergers were notified to the air accident investigations and to the railway. Isolation of the water transport accident investigation board was observed due to the fact that most of these events took place outside of the country's territory. The most distant from the process of integration was the road transport branch. The main reason for this is the dominant feature of the individual car

transport within the road transport system. It gets out of regulators control, which are mainly within transport authorities [10].

In the Netherlands, for example, this process lasted for 22 years. It was launched in 1983 by the Dutch Road Safety Board's (DRSB) application to the Minister of Transport to appoint Dutch Transport Safety Board, an organization similar to the American NTSB. The Board was created 16 years later – in 1998 – its task was to carry out independent research in all sectors of transport. The next step in the creation of the Dutch Safety Board (DSB) was to convince the government of the necessity of DTSB's extension to the other areas where people's lives and health are at risk due to failures of safety systems. Limiting independent research to the sectors of transport only was not justified. Finally, on 1 February 2005 the Dutch Parliament established the Dutch Safety Board, which now deals with the independent research of accidents in all sectors. Only two sectors do not fall within the powers of the Board. These are matters related to violations of public order, and accidents related to the armed forces, for example, during peacekeeping missions.

Conclusions & perspectives

Independent investigations into the causes of accidents and incidents are invaluable to society in general and in ensuring safety. They are the only way to show society exactly what happened. They can put an end to any public concern in the wake of an accident and help the victims and their families to come to terms with what has happened to them. What is of great value to the transport systems is that they can teach us lesson for the future, and prevent the same thing from happening again. Therefore, on the basis of the foreign experiences we strongly believe that international cooperation in the field of transport safety is a prerequisite for the success of the idea of integration.

Awareness of the risk of accidents in the transport system is crucial for the success of efforts to improve transport safety [11]. The basis for the right transport policy in a country focused on safety issues should be politicians' knowledge about innovations and solutions based on scientific research [2]. Considering the issue in the other categories it is important to stress the huge economic and social

costs, which – because of their dispersion in time and space – are not properly seen neither by governments nor by societies, particularly those which are faced with the biggest accident risk [12].

However, in developed countries, the issue of transport safety becomes more and more often perceived by society as one of the most crucial criteria of the quality of life [13]. The standards of a modern organization investigating the causes of transport accidents and the experience from the USA and the Netherlands discussed in the paper were used to identify the key requirements for the integrated transport safety board that is being created in the framework of the “ZEUS Integrated System of Transport Safety Project”. According to the timetable of the project the final shape of this structure will be completed in early 2010.

The whole concept of an independent and integrated board will be presented at ZEUS 2010 Conference that is going to take place at Gdańsk University of Technology on April 21–22, 2010.

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