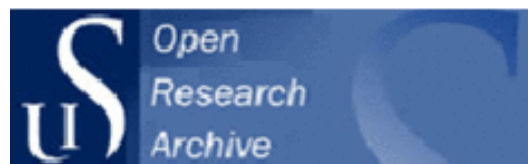




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# Eva Jakobsson

## Accident investigations

### A comparative perspective on societal safety in Norway and Sweden, 1970–2010

*The topic for the article is the growing awareness of risk and safety in Norway and Sweden during the last decades of the 20th century, and how the two Scandinavian states have organized investigations of accidents. In many western states accident investigations have moved from sector specific boards to permanent multi-modal commissions. This has also been the case in the two Scandinavian states. But this comparative study reveals different paths and varying speed towards a 'safety culture'. The Swedish Accident Investigation Board was established in 1990, while its Norwegian opposite partner was established in 2008. Common for the two countries is that reorganization of investigation boards has taken place as political actions after major accidents, rather than as a consequence of risk assessments.*

**Keywords** accident investigations, societal safety, Scandinavian studies, organization of safety society

## Introduction

Kings Bay 1962, Ängelholm 1964, Tretten 1975, Tuve 1977, Restaurant Monte Carlo 1977, Kälvesta 1977, Stadshotellet in Borås 1978, Alexander Kielland 1980, Tjörnbron 1980, Kolbotn 1985, Hotel Caledonien 1986, Olof Palme 1986, Tjernoby 1986, Vassdalen 1986, Lerum 1987, Måbødalen 1988, Torghatten 1988, Partnair flight 394 1989, Oskarshamn 1989, Scandinavian Star 1990, Gottfröa 1991, Vasaplatsen, Göteborg 1992, Estonia 1994, Hisingen 1998, Sleipner 1999, Åsta 2000, Linate 2001, Anna Lindh 2003, Tsunamien 2004, Gudrun 2005.

These names, places and years constitute a collective memory of tragic accidents and traumas in Norway and Sweden. All were sudden fatal accidents, easily delimited in time and space. However, their consequences have been long-lasting and they can be described as results of changes in society; technologically, organizationally or behaviourally. Perhaps we can even go so far as to describe them as consequences of living in prosperous, modern and egalitarian Scandinavian welfare societies.

We have to bear in mind, however, that during the same period many people have been killed in road accidents, on railway lines, in their homes or by drowning without causing the same impact neither in collective memory nor in the mass media. These fatal accidents speak to us in a more silent way – in the noiseless distinct language of statistics.<sup>1</sup>

The sequence of the Scandinavian traumas and all their associations have – probably more than anything else – contributed to our opinion of vulnerability in a modern welfare society. ‘Risk society’ is the frequently used metaphor for this type of society.<sup>2</sup> Thus the safety and risk discourses have contributed to the building up of new organizations. In Norway, the Directorate for Civil Protection and Emergency Planning (*Direktoratet for samfunnssikkerhet og beredskap*) was established in 2003 and in Sweden three agencies (*Krisberedskapsmyndigheten*, *Statens räddningsverk*, *Styrelsen för psykologiskt försvar*) were in 2009 merged into the Swedish Civil Contingencies Agency (*Myndigheten för samhällsskydd och beredskap*). Government reports on the subject have been published: ‘A vulnerable society’ (*Et sårbart samfunn*, 2000)<sup>3</sup> in Norway and ‘Safety in a new era’ (*Säkerhet i en ny tid*, 2001)<sup>4</sup> in Sweden.

This gave rise to a research area on fatal accidents, which not only had the purpose of understanding and explaining accidents, but also to find out how to prevent these accidents from recurring.<sup>5</sup> The societal responses and visions on increased safety also brought forward the establishment of organizations for investigating accidents. The purpose of these new organizations was to investigate fatal accidents; to find out why they happened, why they became so fatal, and whether it had been possible for the societies to reduce their consequences, for example, by improving rescue coordination. In this article this phase of the growing awareness of risk and safety will be analysed; how Norway and Sweden have organized investigations of fatal accidents during the last decades of the 20th century.

The way in which accidents have been analyzed and explained has changed from placing the human factor or technical deficiencies in the foreground to adapting the system metaphor as a model and making man and technology interact. Investigating factory accidents in the 1920s, often placing the responsibility for the accident on individuals on the factory floor, researchers developed a theory (‘olycksfågelteorien’) to define social and psychological characteristics of those who potentially could cause accidents. The purpose was to shut those individuals out from, for example, factory production or road traffic to prevent respectively factory and road accidents. When complex and coupled technological systems developed, such as rail and nuclear power systems, accident models to grasp this complexity were developed. The ‘Normal Accident’ concept, introduced by C. Perrow in the late 1990s,<sup>6</sup> grew out of such a perception. The ‘Normal Accident’ concept emphasized that accidents in complex systems were normal rather than atypical. However, there is still no common agreement on methods for accident investigations, but several competing methods instead. In practise often a mixture of methods and assumptions are used, as, for example, ‘simple-linear system model’ (‘Dominomodellen’) and ‘Complex Interactions’ (the Swiss Cheese Model<sup>7</sup> introduced by J. Reason).<sup>8</sup> According to Stoop, a new school of ‘safety deficiency and system change’ has developed during the 1990s. In this school the independence of the accident investigation boards is vital. So is the principle of not blaming individuals. It is the faults caused by ‘system deficiencies’, with an emphasis on the complexity of the social technological systems, that is focused on.<sup>9</sup>

In the late 20th century two major and complex socio-technological systems were built up in the two Scandinavian countries: in Sweden the nuclear power system and in Norway the offshore oil production system. In connection with these immense technological systems safety institutions and organizations with broad risk and safety expertise have been built up. They have probably contributed to new understanding – or system interpretation – of the causes of accidents. Thus the accident investigations connected to the Swedish nuclear system and to the Norwegian off-shore system were never integrated, nor discussed, in order to become part of the accident investigation boards in the two countries. An exclusive organization for control and risk management has been built up for these grand systems. From a societal perspective on accident investigations there can not of course be separate understandings of accidents.<sup>10</sup>

In many western states accident investigations have moved from sector specific boards (e.g. exclusively for air, railway or maritime accidents), often with judicial power, to broad permanent multi-modal commissions, investigating a broad range of accidents, emphasizing that accidents are not isolated technological events, that only are to be understood in their respective transport system contexts. The US Transportation Safety Board, established in 1967, is often recognized as a model for this broader approach.<sup>11</sup> Thus the American model has inspired the development in Canada, Australia and New Zealand, while in Great Britain there are still separate investigation boards.<sup>12</sup>

The Three Mile Island (1979) and Challenger accidents (1986) had deep impact on the fact that accident investigations turned from interest in the solitary operative individual towards putting management, safety culture and safety climate in the foreground.<sup>13</sup> It has also been suggested that reorganization of Scandinavian accident investigation boards occurs as political actions taking place after major accidents, rather than as a consequence of general risk assessments. Accordingly, accident investigations are organized accidentally determined by major accidents.<sup>14</sup>

## Research questions and sources

The beginning of, the development towards, and the final establishment of what came to be independent, permanent and multi-modal accident investigations boards – in Sweden, the Swedish Accidents Investigation Board (*Statens Haverikommission*), established in 1990, and in Norway, the Accidents Investigation Board Norway (*Statens Havarikommisjon for Transport*), established in 2008 – will be analysed.

In this article each country is discussed respectively and chronologically. In the development towards permanent multi-modal accident investigation boards, some topics are recurrent in varying combinations; whether the board should be permanent or ad hoc, whether the board should be multi-modal or not, whether blame is to be placed on individuals or not, whether there should be a staff with permanent positions or not, which combinations of expertise should be recruited, how independence can be accomplished, and how recommendations and learning can be mediated. Questions will be asked about why special groups for accident investigation were established. How are investigation boards organized and how do they change over time?

Methodically this will be done by reconstructing and comparing the decisionmaking processes behind these organizational changes and innovations in Norway and Sweden. At first glance a comparison between Sweden and Norway

reveals a great difference between the nation's chronologies of accident investigations. Despite the fact that we find ideas of permanent multi-modal boards in both countries during the last decades of the 1900s, it took 20 years before Norway established a multi-modal accident investigation board for the transport sector, while Sweden already in 1990 established a multi-modal accident investigation board for the whole range of major accidents. Sweden, together with Finland, was the first country to institutionalize multi-modal accidents investigation boards for all kinds of major accidents.<sup>15</sup> In this comparative study the societal embedment for creating these organizational innovations will be enlightened.

The roads towards broad multi-modal accident investigation boards in Sweden and Norway are analysed. How these organizations developed indicates new ways of understanding major accidents. Also to give attention to the times when new organization models were *not* chosen and to find the reasons for this is important in this article. By not describing the development as linear, history will appear diverse – and less evolutionistic.

The above hypothesis, on new organizational solutions as reactions to unique major accidents, rather than results of risk analysis, is interesting. The hypothesis is put forward by researchers who have been central actors in the research fields of risk and security in Norway for several decades. Would the hypothesis on political action as a reaction to major accidents be valid as an explanation for the differences between Swedish and Norwegian accident investigation boards?

There are, however, other possible motives than political reaction to major accidents. One motive, already mentioned, is a change to a system-based understanding of major accidents, an interpretational framework that would indicate that one, for example, no longer distinguished a maritime accident from an air accident. If research – both technological and in social science – has increasingly focused on the 'risk society', can this historical analysis discover any references to this growing research field? And – if this is the case – does this become a motive for changing the organization of accident investigation boards? A further problem, as mentioned earlier, is to find the reasons why one organizational model is preferred to other possible models. There must be reasons and motives for alterations as well as for status quo. What explicit intentions can be found?

The risk society is a central concept in the discussion around accident investigations. How is the risk context described on a societal level in the documents on new organizational solutions? How do the descriptions change over time? Investigating these descriptions we can reveal how they are connected and how they contributed to changes in the organization of accident investigation committees.

Government reports and parliamentary documents are used as primary sources. Some archival sources have been used. In this selection we can examine the official decisions and the political discourses. As a rule these documents are characterized by a low level of disagreement. They are often texts of few words, and clearly they are not part of main stream political debate. By this perspective we can pay attention to the intentions, but not how accident investigations have been performed. It is obvious that another narrative would have been presented if, for example, interviews with some central actors among politicians, administrators, experts or members of ad hoc as well as permanent accident investigations boards could have been conducted.

## Sweden

### *The early accident investigation organizations*

Aviation increased during the post-war period parallel to motor traffic. Both became transport systems for the general public. Even if road traffic killed the highest number of people,<sup>16</sup> it was aviation that was most dependent on performing as a safe transport system. One single aircraft accident made more damage to the confidence of the system than the death toll on the roads could ever do to road traffic. Therefore it was of great importance to build up confidence for aviation.

In 1957 new aviation legislation was passed. It was a result of Nordic cooperation and the jurisdiction became to a large degree common for the Nordic countries. In these laws one could for the first time find rules on how to conduct accident investigations of civilian air accidents. The 'starting shot' for a development towards a centralized organization for accident investigations is said to have been fired in 1959, when the independence of the internal military accident investigations was called into question by the military ombudsman (*militieombudsmannen*). The criticism was perceived as a question about objectivity and a problem of efficiency, emphasizing that no one should investigate one's own operations. The fact that the investigations were pursued by employees as extra work on top of their daily work was called into question.<sup>17</sup> Consequently the Swedish Air Force established its own accident investigating board in 1966, consisting of permanent members with a specific mandate to investigate military aviation accidents.<sup>18</sup>

In the middle of the 1970s a government committee proposed the establishment of a joint accident investigation board for civilian as well as military flights – or 'a central authority for investigating major civilian and military aviation accidents'. The aim for its activities was to prevent reappearance of identical accidents. As we have seen, there had been criticism against many investigations carried out as spare-time occupation and consequently the investigations were dependent on the individual's 'personal interest and desire to take on extra assignment'. Furthermore, those who investigated were often the same individuals that were to be investigated. To meet this criticism the Swedish government established the Swedish Accident Investigation Board (*Statens Haverikommission*, SHK) in 1978, to investigate aircraft accidents, civilian as well as military. The need for effective accident investigation was, according to the government, due to the expansion in aviation and the technological development during the preceding 20 years. The government wrote: 'The most important object for the accident investigation must be to explain the causal connection and possible shortages in the total safety system'. Another way to emphasize the system level of the investigations was not to prioritize the search for someone to blame for the accident. Aviation safety was instead best served if one could find out 'why a procedure was organized in such a manner that a human mistake could cause an accident, and propose measures that contributed to avoiding that the same event would happen again'. An independent permanent accident investigation institution would, according to the government, satisfy demand, effectiveness as well as objectivity. The arguments were strengthened by referring to an international trend towards permanent investigation boards, independent from safety authorities. From these intentions and expectations one can discern a system understanding, and the position that accident investigations should be contextualized and professionalized.<sup>19</sup>

The new SHK was led by a director-general with background as a judge and four accident investigators with background in aircraft operational or technological knowledge and experience.<sup>20</sup>

From 1958 on, the problem of safety control authorities performing maritime accident investigations had been discussed.<sup>21</sup> The 1963 maritime law committee proposed a separate board for investigating major maritime accidents. And since 1967, the Swedish Maritime Accident Investigation Board (*Sjöfartens haverikommission*) has been in operation, parallel to the Maritime Inquiry Institute (*Sjöförklaringsinstitutet*). However, it has been labelled as ‘quasi-permanent’, as it did not convene until it was given permanent members in the middle of the 1970s.<sup>22</sup>

It was the trade unions – the Swedish Ship Officers’ Association (*Svenska fartygsbefälsföreningen*) and the Swedish Seamen Association (*Svenska sjöfolksförbundet*) – who had spoken up for a permanent maritime accident investigation board. In that discussion it was claimed that ‘the fast technological development [ . . . ] has little by little increased the demands on the reliability and effectiveness of the total maritime systems safety’. Preferably this would be done by a permanent authority, not an ad hoc committee, which should be independent from safety authorities and the Maritime Inquiry Institute.<sup>23</sup>

The result was that in the late 1980s there were three parallel organs for investigating maritime accidents; the Maritime Inquiry Institute, the Swedish Maritime Accident Investigation Board and the Swedish Maritime Administration (*Sjöfartsverket*).<sup>24</sup>

### *The State Catastrophe Board – an interlude and a model*

‘The committee (Kn 1981:02) for investigation of major accidents’ (*Kommitten (Kn 1981:02) för undersökning av allvarliga olyckshändelser*), the committee with the clumsy name, was established in 1981. Usually it was named the State Catastrophe Board (*Statens katastrofkommission*). During the years before its establishment, Sweden had been deeply shaken by several major accidents; the land slide in Tuve in 1977, the fires in the Monte Carlo Restaurant in 1977 and at a hotel in Borås city in 1978.

As these accidents could not be investigated by the newly set up SHK, because it only handled aircraft accidents, the idea of a committee for investigating major accidents was put forward by trade unions that had been affected by these accidents.<sup>25</sup> Let us look closer at the arguments used for establishing this innovation in investigating accidents.

In the preparatory works the argumentation took its preliminary starting point in a description of a new society: ‘Societal development is characterized ... by the fact that many activities become more and more complex. New substances, materials and activities – often having new and unknown accident risks – are constantly being developed. The number of accidents as well as the damage costs is on the increase’. Damage by fires had been doubled during the preceding decades. Many individuals had been mortally wounded in accidents ‘relatively unknown in Sweden’. There were no organizations at hand for investigating this category of grave accidents, and it created a situation where no ‘transfer of experience’ could help understanding ‘the interrelations between materials, construction and human reactions’, a position that indicated the need for a system understanding of accidents. A new understanding of accidents was formulated by accentuating that learning from accidents was essential – there was a need for an ‘organized method to bring back results’ and one expected it to be much simpler ‘to work crosswise – across orders between different activities and accident categories and across boards for diverse specialist knowledge’<sup>2</sup>

Sweden was at this time close to a hegemonic social democracy; the trade unions and the government were closely linked. This meant that when the Hotel and Restaurant Workers' Union (*Hotell- och Restauranganställdas förbund*) in the autumn of 1978 wrote to the Ministry of Local Government (*Kommundepartementet*) it was an act that easily could give results. In the letter it was referred to the many hotel and restaurant fires that had occurred both internationally as well as in Sweden. Probably it was a hotel fire on the Greek tourist island Rhodes and a hotel fire in Amsterdam in 1977, where many Swedes burned to death, one had in mind. Fires at the Luxor factory in Motala, the Electrolux factory in Mariestad, and a reactor fire at the Barsebäck nuclear power plant are explicitly mentioned in the preparatory works. In Sweden four lives were lost in the fire at Restaurant Monte Carlo in Stockholm 1977.<sup>27</sup> The greatest impression was probably made by the 1978 fire at the main hotel in Borås (Stadshotellet in Borås). In the early summer night the higher school examination celebration in the hotel ended in a fire catastrophe causing the death of 20 young individuals. During the reconstruction of the course of the fire one found out that with some simple measures before and during the initial phase of the fire this tragedy could have been averted.<sup>28</sup>

The trade unions expected the information produced in such accident investigations to bring knowledge that did not only limit but even ended the occurrence of such major fires. Therefore one considered it 'appropriate to establish a permanent state investigating board. Bearing the latest catastrophic fire at the main hotel in Borås in mind, a decision to do so is completely necessary'.<sup>29</sup>

An internal ministry committee was set up, and it proposed a new organization to investigate major accidents. In its report, 'Investigation of major accidents', one even predicted a future societal development in which a new type of accidents would occur.

Society is becoming increasingly complex and more vulnerable. New substances, materials and technological processes with – sometimes – new and unknown accident risks, are constantly developing. Society continues to be urbanized. Industrial production and other trades are concentrated. By increased large-scale production plants and different means of transportation achieve more and more capacity. The consequences of every major accident are increasing.<sup>30</sup>

A board for investigating major accidents could contribute to a continuity whereby investigations were not performed haphazardly. Continuity in accident investigation would also contribute to more systematically performed investigations and thereby increase the reliability of the investigation methods.<sup>31</sup>

It was stipulated, once again, that the most important objective was to prevent new accidents. Several categories of accidents were mentioned specifically: Fires, explosions, land slides, mining accidents, flooding, storms and snow storms, mountain accidents endangering people, road accidents that could have been avoided if preventive actions had been made, railway, tram and subway accidents, industrial accidents with injuries to employees, nature or environment, accidents in connection with entertainment, discharge of radioactive substances, chemicals and oil. Interestingly, it was proposed that one type of accident – nuclear power plant accidents – was *not* to fall under the jurisdiction this new accident investigations board. The new board should collaborate



with the police, but was not to handle questions of individual responsibility or compensation to the individuals who had been hurt in the accident in question. The board should consist of a permanent staff of persons with competence in law, technology, fire protection and rescue service, labour inspection and healthcare.<sup>32</sup>

Except for aviation and maritime accidents, the State Catastrophe Board could choose the accidents they wanted to investigate. But still there was no legal decree on how these accident investigations were to be accomplished.<sup>33</sup>

### *The split 1980s*

During the 1980s the Swedish Accident Investigation Board – the SHK, the Swedish Maritime Accident Investigation Board and the State Catastrophe Board worked side by side. The jurist Lars-Göran Malmberg has described this as a period of ‘sharp competition’, where all the three parties wanted to develop their own niche.<sup>34</sup> Therefore, both SHK and the State Catastrophe Board were evaluated in 1986. Each of them wanted to keep their organizations permanent – SHK even had ambitions to expand its operations. Speed, objectivity and effectiveness were used as words of prestige by both parties for defending their own existence. Surprisingly, the outcome of the evaluations was that the State Catastrophe Board was liquidated as it was forced to merge with the SHK.<sup>35</sup> Let us look closer at how this happened.

Since it was established, the State Catastrophe Board had written 21 accident investigation reports. The board claimed that their reports were unique in comparison to the SHK reports as ‘the committee has developed its own specific nature’. The State Catastrophe Board also distanced itself from the SHK by maintaining that the SHK ‘usually was primarily specialized’ and that the SHK treated ‘similar questions which often are the products of short accident courses’. This can be interpreted as the State Catastrophe Board perceived itself as having a different understanding from the SHK. Their investigations had, according to the State Catastrophe Board, developed into so different directions ‘that they could hardly be coordinated by one investigating agency’. A merger was thus expected to bring neither rationalization nor budgetary savings.<sup>36</sup>

The investigation boards for aircraft as well as for maritime accidents were objects for a new departmental report in the same year, in 1986.<sup>37</sup> The result was the recommendation to establish a *joint* organization for accident investigations in aviation and navigation. This should be done by abolishing the Swedish Maritime Accident Investigation Board, which was criticized for being too slow in finishing their reports.<sup>38</sup>

Like so many times before it was suggested that this new commission should work on safety problems only, and not to search for individuals to blame. The unbiased role of the new commission must also be underlined by its independence from safety control authorities. In this report a new argument was introduced to strengthen its recommendations, namely that the report should be written in a style that everybody who was interested in the matter could easily understand. This would contribute to the possibilities for public control.<sup>39</sup> In the report it was claimed that aircraft accidents were of a different character – more injuries or deaths – than navigation accidents. However, with a good deal of premonition the report anticipated that ‘a definitive catastrophe’ was much closer in time in maritime passenger traffic than in aviation (this was still 4 years before the Scandinavian Star fire and still another 4 years would pass until the loss of the Estonia ferry). No key argument could be found for maintaining the separate

organizations. But why was the State Catastrophe Board not included? Simply because, as we already have demonstrated, of the resistance among its members.<sup>40</sup>

### *A U-turn by the Social Democrats*

1986, the year of the evaluation of the accident organization investigations, was also the year of two very dramatic catastrophes that hit Swedish society: the assassination of Prime Minister Olof Palme and the radioactive pollution from the Tjernöbyl nuclear accident brought in by winds over Sweden. These events were of a very different nature. At the same time they had in common their thoroughly new character; with far-reaching psychological and natural effects, and long-lasting in the sense that the consequences were complex – both to forecast and to repair. 1986 and the years that followed put Swedish society and state under pressures of a kind it had not experienced before. Two years later a new tragedy struck the Swedish society – the Måbødal Accident (*Måbødalolyckan*). As it again struck school children its influence was comparable to the Borås fire 10 years earlier. During a school bus trip to the mountainous western Norway the bus brakes gave away in a sloping tunnel. Twelve children and four adults were killed, 18 persons were injured. Since this was a new type of accident affecting people seeking adventurous travels both in and outside Europe, the whole situation was complicated by the fact that the accident occurred far away from the families' homes.

When the Social Democratic government the following year, in 1989, presented a bill on accident investigations to the Swedish parliament, *Riksdagen*, it chose not to follow the recommendations of the committees' reports that had promoted a continuation of parallel organizations. The governmental bill was radical and far-reaching, and as previously mentioned, one of the first in the world – 'a common practice for investigating all kinds of major accidents for security reasons, whether they take place in aviation, in navigation, in railway traffic or in any other activity'. By this bill the government introduced the principle that the same practice would be valid for all kinds of accidents; a position that was not shared by the State Catastrophe Board, as they claimed that the current investigation committees used different investigation methods and produced reports that deviated from each other and were so fundamentally different that any merger was impossible.<sup>41</sup>

The government emphasized that the most important motive in accident investigations was to find the causes of the accidents and to be able to avoid them in the future. This was not new – it was a mantra to be repeated over and over again. The government claimed 'there is a value in that major accidents regularly is investigated by a qualified societal authority, which at the same time is independent from those who are responsible for making regulations and control of the activities under which the accident has happened'. In short, the government declared its acceptance of the fact that there were some differences between SHK and the State Catastrophe Board. According to the government these differences were not too great to be overcome. According to the government, it was not 'rational' to have parallel organizations at work. The government also wrote that 'for the public it must appear most natural that the same institution has the responsibility for various types of accidents'. This task would go to the SHK. To gain safety knowledge, it was the major accidents and those less serious, but of safety interest, that were expected to be investigated. Most surprising, as it was by no means anticipated in earlier reports, this new organization was to be strengthened by new legislation for

'investigations of all major accidents and other events that are important for safety'.<sup>42</sup> In the parliament the bill was interpreted to be so flexible that even traffic accidents, which one knew so little about, could be investigated by this new organization.<sup>43</sup>

A new and comprehensive legislation was passed in 1990 – Legislation (1990:712) on accident investigations (*Lag (1990:712) om undersökning av olyckor*) – whereby a centralized multi-modal accident investigation board was established. The SHK took over all assignments from the State Catastrophe Board and the Swedish Maritime Accident Investigation Board (the Maritime Inquiry Institute was retained). It was expected that a 'uniformity in accidents investigation methods would spread itself'. Some international influence on the legislation can be traced. However, according to Lars-Göran Malmberg, it can be characterized as to be, 'to a great part, a Swedish construction'.<sup>44</sup>

Later it has been claimed by Malmberg that the effectiveness aimed for in the 1990 construction, which was to create the institutional capacity to make fast reports and to investigate the essential accidents, has not been achieved. The research board has too few employees in relation to the tasks at hand, and the actual group of potential experts is so small that it constitutes a threat to the objectivity of the group.<sup>45</sup>

## Norway

### *The Norwegian tradition of ad hoc investigation*

The Norwegian accident investigation committees originate from a long Norwegian tradition of ad hoc commissions. These ad hoc investigation commissions have their historical roots as early as in the political struggles during the 19th century. They were vehicles for examinations of a variety of social incongruities, real as well as alleged wrongs. The latter were convenient tools in the political power struggles that led to parliamentary rule. Gradually this system of ad hoc investigation committees was used to examine what we label major accidents. Towards the end of the 19th century, ad hoc commissions developed by combining the power for distributing guilt for the accident and for establishing its causes, at the same time as they relinquished their judging function. Still, ad hoc commissions, up to the 1920s, from time to time carried out judicial functions.

This perspective is applied in a massive comparative and empirical study by Harald Koht on ad hoc governmental investigative commission reports in the United States and Norway. His time line is long – from the 1820s to 2009. In his study he claims that in the United States the system-based explanations were introduced already in the late 1800s, while a corresponding change did not occur in Norway until in the 1960s. Koht asserts that Norway during the early decades of the 20th century, in contrast to the United States, was preoccupied with nation-building after its move towards independence in 1905. This remarkable lag between the breakthroughs for system levelled explanations in the Norwegian accident reports compared to the American ones must be understood, according to Koht, by the late breakthrough at the end of the 1940s of social sciences in Norway. Koht describes how governmental investigative commission reports change from blaming individuals to the present system-oriented or contextual explanations and discusses which factors have contributed to such a change. He introduces some possible hypotheses: the changes in political cultures where 'equality cultures' (*likhetskulturer*)

will prioritize system-based explanations, or changes in the way committees are put together of different expertise. Koht's conclusion is that it has made no difference if governments were on the left or the right. This discredits, he argues, hypothesis based on political explanations. The fact that lawyers and officers have been replaced by engineers and social scientists in the governmental investigation committees has been significant, according to Koht, because the latter tend to use system-oriented explanations. This can, in turn, be explained by varying cultures at the different schools and universities where the experts have been educated. Koht claims that by using system-based explanations the experts have recognized that organizations are complex and thus it gives no meaning to blame individuals.<sup>46</sup>

One particular accident report is regarded as a watershed in the history of Norwegian accident investigation, namely the examination after the mining accident in Svalbard in 1962 – the Kings Bay accident. It was in this investigation that the system perspective broke through in Norway. Because the investigators emphasized that the system had failed, the accident led to the dismissal of the responsible persons at the highest level, namely the government. After what then had become a political question, the so-called Eckhoff panel tried to establish clearer frames around the accident investigations by working out proposals for rules for investigative commissions. In 1975 these proposals were incorporated in the circular (*Rundskriv*) G - 4 8 /75 which still constitutes the only guideline for investigative commissions. The circular gives, for example, guidelines on procedures for appointments of members to the investigative commissions and for the procedure of investigation. The preference for regulating these questions in a circular instead of by law was motivated by the fact that judicial regulation could imply a too high degree of institutionalization of the investigative commissions.<sup>47</sup>

In general we can establish that, after the Kings Bay accident in 1962, accident investigations have successively been separated from the traditional ad hoc organized committees. We will now turn to the establishment of permanent accident investigation boards.

### *The first permanent accident investigation board in 1989*

Precisely as in Sweden – and in accordance with international obligations – the Norwegians established ad hoc special commissions to investigate aircraft accidents. The members of those commissions were appointed by the Ministry of Transport and Communications. The police participated in the ad hoc commissions. But already from 1948–49 the police withdrew from these commissions. From then on the police and the commissions conducted separate accident investigations. As a matter of standard procedure the reports on accidents had as their main aim to 'prevent similar accidents in the future'. These commissions were often criticized for being too close to the aviation industry since their members were experts who were in many cases recruited from the aviation industry. One result of this criticism was the appointment of a permanent commission for aircraft accidents in 1956. Its mandate was to investigate questions of guilt and responsibility, but not to consider possible penalties.<sup>48</sup>

In the middle of the 1970s the Aircraft Accident Investigation Board (*Flyhavarikommisjonen*) got a more permanent character by the establishment of a secretariat headed by a permanently employed leader. This was the somewhat meagre result of a discussion of several possible organizational solutions that were presented

in a proposition on how to organize accident investigations. We can use that proposition here to study what potential organizational solutions one envisaged in Norway at this time. One alternative was that the Aviation Directorate (*Lufthavsdirektoratet*) conducted all aircraft accident investigations. Another alternative was that the police should be in charge of all such investigation. Further on one could consider the establishment of a special court, or a combined commission for civil as well as military aircraft accidents. And finally, as one alternative, already in this proposition, a multi-modal investigation board for all accidents was discussed.<sup>49</sup> However, it is interesting to note that the modest organizational result of rather great ambitions to solve a broad variety of problems was a secretariat with only one employee.

Not until 1989 was the first permanent accident investigative commission for civil aviation appointed in Norway.<sup>50</sup> The Accident Investigation Board for Civil Aviation (*Havarikommissjonen for sivil luftfart*, HSL) worked on the basis of the aviation legislation and of international conventions and rules for investigation of aircraft accidents. The aim of the board was to prevent future accidents, but not to assign guilt or responsibility for the accident in question. The reports from the board had to be public, but the board was not authorized to present concrete proposals on suitable changes.<sup>51</sup> Furthermore the new accident board was not obliged to report on its discoveries to the police or to the prosecuting authority.<sup>52</sup>

### *The long road towards a multi-modal accident investigation board*

Already a couple of years after the establishment of the first permanent accident investigation board in 1989, proposals for the establishment of a unified commission for the transportation sector were discussed.<sup>53</sup> In the aftermath of a train accident at Kolbotn in the Oslo area in May 1985, the Norwegian State Railways (*Norges Statsbaner*, NSB) raised the question whether there was a need for a general commission for investigating major accidents within land-based transportation as 'there will be increased risk for serious accidents in a modern high-technological society'. Against this background an internal report was written in the Ministry of Transport and Communications on the need for a commission to investigate so-called 'major accidents' in order to prevent future accidents. The advantage, it was emphasised, by an external commission was that it could maintain 'complete objectivity' and would represent continuity and accumulate experience. It was economically rational to institutionalize one central commission instead of many specialized ones. The counterargument was that accidents are so diverse in nature that different kinds of expertises are necessary to investigate them. Considering the wide range of accidents to be investigated, several special commissions were more effective than one central commission, the report claimed. The Norwegian Civil Aviation Administration (*Lufthavsetilsynet*) maintained that the idea of one, common accident commission was not in the interest of aviation. The Norwegian State Railways was, as mentioned, positive to the idea of one common commission, but on the condition that the principle of common investigation would not eliminate the need for internal commissions. The Norwegian Public Roads Administration (*Vegdirektoratet*) opposed the establishment of commissions on a permanent basis. They had already implemented test arrangements for investigating road accidents, but their conclusion after these tests had been conducted was that they did 'not contribute to obtaining new knowledge on why accidents happen'. The research institute SINTEF even introduced the new idea that the

researchers must participate in accident investigations. The Ministry of Justice and the Police supported the claim on research representation in its hearing report. On the other hand the ministry preferred not to terminate the existing commissions. The Ministry of Transport and Communications concluded its hearing report by stating that the ministry did not support the idea of one common commission for the transportation sector only, at least not until further studies had been carried out. And if one included in the concept 'major accident' (*storulykke*) even fires and explosions and first and foremost accidents connected to the petroleum industry, the Ministry of Transport and Communications considered the further study of the future organization of accident investigation to be a question for the Ministry of Justice and the Police to deal with.<sup>54</sup>

It was a conservative government which in 1991 gave the Ministry of Justice and the Police an open mandate in its further study of the accident investigation question. Two years later, in 1993, and at that time the country was led by a Social Democratic government, the ministry answered short and concisely that its impression was that the current organization functioned well: 'We cannot see that a possible major accident commission [*storulykkeskommisjon*] would replace any of them. In general we think that one should not continue in the direction of an essential extension of the objects for investigations in commissions'. The ministry furthermore underlined the importance of 'expert knowledge' (*spisskompetanse*) in the accident investigation boards and the demand for such competence would vary heavily from accident to accident. The ministry intimated that it was still doubtful about the idea of a common commission. If all imaginable accidents should be investigated in the same, permanent commission, the ministry warned, the committee had to be very large. The resources required would be greater than the results that one could expect to get in return. 'Major accidents of the same character are so rare that one will not ensure substantial continuity and experience'. Therefore there was, according to the Ministry of Justice and the Police, no need for one common 'major accident commission'.<sup>55</sup>

The idea of a broad and permanent accident investigation board originated, as mentioned, in a governmental proposition in the mid-1970s. It can also be identified in a work from 1982 by one of the leading accident researchers in Norway, Jan Erik Vinnem. On the condition of continued independence from the industry in question, he claimed that Norway would gain by setting up an independent accident investigation board with the mandate of performing systematic investigation into the causes of accidents and with preventative aim.<sup>56</sup> Even the Norwegian Technical-Scientific Research Council (*Norges Teknisk-Naturvitenskapelige Forskningsråd*) concluded in a report on 'major accidents' in 1983 that there had been 'developed a better and more detailed methodology for the analysis of risks'.<sup>57</sup>

The concept and the consciousness of interdependences in risk analysis was in other words both articulated and formulated in academic circles. But then, as we have seen, the idea was dropped by the Ministry of Justice and the Police in 1993.

#### *Towards the idea of multi-modal accident investigation boards*

In 1999, the Maritime Law Commission (*Sjølovskomiteén*) declared that the traditional maritime accident inquiry did not meet the requirements of contemporary maritime security. The answer to the new needs was the establishment of a permanent investigating board for maritime accidents. This new board ought to be permanently staffed.

This initiative from the Maritime Law Commission turned out to possess heavy definition power. It was to be referred to in several reports. The proposal for a maritime accident investigation board is all the more surprising – as well as interesting – as the Maritime Law Commission was clearly aware of the fact that their suggestion goes beyond the mandate for its report. But in a passage in its report it took up the Finnish and the Swedish model with one common board for all major accidents and concluded by declaring it to be the best solution ‘in the long term’. The commission stated that its members realized that its recommendation, if followed, would imply a ‘radical infringement’ on the traditional methods of dealing with accident investigation in Norway, and it predicted that a transition to such a system would become ‘time consuming and to some extent complicated’ to implement. The Maritime Law Commission member, Karin M. Bruzelius,<sup>58</sup> permanent undersecretary in the Ministry of Transport and Communication during the last half of the 1980s when that ministry in the earlier mentioned internal report discussed ‘investigative committees for large scale accidents’, now again called attention to the necessary similarities with the already existing Accident Investigation Board for Civil Aviation. Bruzelius thought that an accident investigation board could make a better effort to increase the level of transport security and simultaneously optimize the existing resources.<sup>59</sup> These few examples from the archival material show that the idea of a common accident investigation board survived all efforts to eliminate it and how that happened.

In 2000 the government report, *A Vulnerable Society* (Sårbarhetsutredningen: *Et sårbart samfunn*), which took a superior and comprehensive approach to questions on risk and security in the Norwegian society, was published. The experts behind that report recommended that a common and permanent accident investigation board would be established, composed of highly qualified members who were thoroughly competent on investigation methodology and who could use their individual competence to accumulate higher competence individually and collectively. If so needed, it was recommended that there must be a possibility for this committee to strengthen its list of members by external experts with relevant special skills. In this formative report there is clear reference to those recommendations that had been formulated by the Maritime Law Committee the preceding year. Furthermore the *Vulnerable Society* report confirmed the continued potentiality for learning from those accidents that occur. The difficulty lies in the problems connected to ‘establishing a system for systematic and overall collection of experiences in order to integrate such collections in the preventive efforts’. *A Vulnerable Society* thus claims that the methodology for accident investigation still has potential for improvement and that ‘there is much to be learnt across the various sectors’ as one often finds similar problems, even on organizational matters and in connection with the distribution of responsibility.<sup>60</sup>

It was not only in *A Vulnerable Society* that the organization of accidental investigation was discussed during 2000. In the National Transportation Plan (*Nasjonal transportplan*) for the period 2002–11,<sup>61</sup> which probably is publicly best known for launching the so-called ‘zero vision’ concerning road accidents: ‘a vision that no accident should occur where persons were killed or suffered lifelong injuries’, established that it was important to separate accident investigation and police investigation. In 2000, the Accident Investigation Board for Civil Aviation was still the only Norwegian permanent and independent investigative commission. Regional analysis groups had been established for road traffic accidents. The railway sector had its own, internal commissions that

did not report on their work to the public. On the background of serious and major accidents – the Sleipner shipwreck in November 1999 (16 dead) and the Åsta railway accidents in early January 2000 (19 dead) – the first measure was to link air and railway in one common accident commission. The Social Democratic government now opened the gate for the possibility to establish a multi-modal accident investigation board. But the government hesitated to make the next step, and came to a halt by proposing an accident investigation board for railway and aircraft accidents and indicated that an accident commission for investigation of all transport accidents would be established in the future.<sup>62</sup> The leading conservative parties, the Progressive Party, the Conservative Party and the Liberal Party (*Fremskrittspartiet*, *Høyre* and *Venstre*) wanted to establish directly a multi-modal accident investigation board.<sup>63</sup>

Simultaneously, however, an enlarged accident commission was being formed somewhere else. A permanent investigative authority for the railway sector was discussed in connection with the proposal for a new legislation for the railway system in 1993. At that time the idea was that the funds needed for establishing a permanent commission were too large considering the few accidents that occurred in the railway sector. One huge change in the accident pattern would change this attitude to the potential benefits connected to the costs of a permanent accident apparatus. The Åsta railway accident in 2000 contributed to the changed position. Suddenly and resolutely after that accident and without awaiting any new report on the reasons behind it or the consequences of that particular accident, the Social Democratic government now wanted to let the railway accident investigations merge into a permanent commission by extending the mandate for the Accident Investigation Board for Civil Aviation and to bring experts with railway competence into this board. This new board became operational in the summer of 2002 with the name the Accident Investigation Board for Civil Aviation and Railways (*Havarikommisjon for sivil luftfart og jernbane*).<sup>64</sup>

Already a year after the Åsta accident – in the summer of 2001 – the Social Democratic government started contemplating whether one should now establish a multi-modal board for accident investigations. The choice was between either major transportation accidents or major accidents in general. This was an idea that stemmed from the political think-tanks during these years, which planned for a reorganization of the entire public sector. In other words this initiative did not primarily originate from assessments on accident investigation methodology or risk and security analysis in society. The former conservative coalition government had proposed the same as a follow-up of the *A Vulnerable Society* report.<sup>65</sup> When a new conservative coalition government took office during the autumn of 2001 its programme, negotiated between the cooperative parties in the government, contained one point on ‘having one board for investigating accidents in different transport sectors’.<sup>66</sup>

At the entrance to the 21st century the idea of establishing a multi-modal board for accident investigations had matured to political consensus.

### *The winding road to a common commission for accidents*

In the 2002 ‘Report on the establishment of a common board for accidents’<sup>67</sup> the knowledge from, and follow-up of, safety advice after accidents were emphasized as the central tasks for a new board for accident investigation. In this report, Bruzelius’



contribution from 1999 was referred to, as the idea of establishing one permanent organization was seen as a central element of the argument for supporting a multimodal accident investigation board. The question was now whether the commission should be incorporated in an existing but enlarged commission or whether a new commission would be formed. There were possible economic synergy effects. Instead of a commission for the investigation of maritime accidents there were good arguments for the idea that 'the investigation of maritime accidents [could] be done in a broader circle of professional technical competence on accidents and causality in general'.<sup>68</sup> The same kind of motivation was given for arguing that the quality of maritime accident investigations should increase in a 'broader professional environment which possessed high expertise in the areas of accident evaluations and questions of causes'.<sup>69</sup> One of the benefits that followed from a broad organization was that the methodological and human factors came first by designing the investigations in such a way that they could contribute to the learning process to prevent accidents – and to the clearer and more reliable identification of the recipients of the security recommendations that the committee was obliged to deliver.<sup>70</sup>

Even if the authors of the report claimed that the efficiency of the existing small organs could evaporate, the conclusion was that a wider commission for the investigation of accidents ought to be established. The authors conclude by recommending a commission for accident investigations for the entire transport sector, but not a general major accident commission. When several members have a combined major experience from the transport sector, one can make use of resources that account for 'such objects and matters as underlying causes for accidents, investigative methodology, human factors – even if it might be difficult to state exactly the degree of influence of such factors to the cause of the accident in question'.<sup>71</sup>

The report put, as we have seen, road traffic in a separate category. The reason was certainly not that there were too few accidents on the roads, but the accident pattern deviated sharply from other accidents. Therefore the authors of the report demanded a special report on the road traffic carried out by 'a group of people who have their competence from road issues and investigative methodology'. In contrast to earlier reports, it now seemed to be an advantage that the road sector was involved since that involvement would imply enhanced competence. Conversely, there were obviously good reasons for a new and strengthened commission for the investigation of road accidents due to the high number of casualties on the roads. The question was which traffic accidents were to be investigated and which were not.<sup>72</sup>

The question of the enlargement of the board to also investigate road accidents was treated by a separate workgroup.<sup>73</sup> Their opinion was that if investigation of road accidents were to be included in the tasks of the new common commission for accidents, one had to select what kind of accidents to treat in the commission and which road accidents should be excluded from the commission's actions. The workgroup wrote that a narrow demarcation between them would be useful. The road accidents suitable for the commission's investigations were such traffic situations that had a high risk potential and where the commission investigation could enhance security. It was emphasized that the selection process must aim at such cases to be included in the investigations that they could contribute to 'the accumulation of such knowledge that road authorities did not already have, and that it must be possible to follow up such know-how by adequate measures'.<sup>74</sup>

One result of this process was the establishment of the Accident Investigation Board Norway (*Statens havarikommisjon for transport*) in 2005 with a mandate that even included serious incidents in road traffic, air transport and by railway.

Finally, from 1 July 2008, also maritime accidents were included in the mandate for the Accident Investigation Board Norway. The aim of the operation is to increase security. Questions of guilt and juridical responsibility must be put aside. All participating parties in the investigation process have the duty to give all pertinent information they might have to the commission – irrespective of obligations of confidentiality. Last but not least, the report after any accident must contain a review of the causes and recommendations for measures to be implemented to prevent new accidents of the same kind.<sup>75</sup>

In his book on investigations, Johan Giertsen has identified three hallmarks in the new Norwegian multi-modal accident investigation board: independence, since the board cannot be instructed by those organs or institutions that compile or decide rules or routines that might be a matter for investigations; the board's mandate implies a duty to investigate the course of events and even the causal factors; and the board has the responsibility to investigate circumstances that can prevent new accidents. The Accident Investigation Board Norway has no responsibility for the implementations of their recommendations.<sup>76</sup>

## Conclusion

Clearly throughout the late 20th century *any* kind of accident investigation model was meant to have a didactic function; to make institutions learn from accidents in order to avoid repetitions of similar types of accident. The doctrine of increasing the learning by reforms has been repeated in the Swedish as well as the Norwegian sources over and over again. But *how* it could be done has not been clear and articulated. It remains to reflect on the question whether these re-organizations towards permanent multi-modal accident investigations boards have contributed to learning and if, by such learning, our societies have become more secure.

The attempt to identify descriptions of societal changes and to find out how they can be tied to efforts for altering the accident investigation boards showed that the descriptions of what we often call the 'risk society' have not changed significantly. Surprisingly enough the descriptions and characteristics of a society with risks and perils seem to have been stable since the 1970s.

An important difference between Sweden and Norway is that the *objectivity* criteria, as, for example, the independence from safety controlling authorities, have been more central in the Swedish discourse. A corresponding central concept in the Norwegian discourse is *legal security* (*rettssikkerhet*) that opens for emphasizing the rights and protection for individuals in investigating processes.

There is an apparent difference in the chronology between the two countries. Norway had its first permanent, but specialized, investigating board for aviation at the same time as Sweden established a broad multi-modal accident investigating board for all major accidents. The fact that it would take almost another two decades before Norway established a new multi-modal accident investigating board – though only for the transportation sector – cannot be given a clear explanation. The very lengthy process towards a joint accident investigating board for the whole transport sector is an interesting factor

in the Norwegian development. We can trace the idea more than a quarter of a century earlier in a parliamentary bill of one board ‘investigating all major traffic accidents – as well with car, as with railway, ship or aeroplane’.<sup>77</sup> But some plausible explanations for the discrepancy in time between the two Scandinavian countries can be suggested.

Norway has a long tradition for appointing ad hoc investigative commissions as an alternative to permanent accident investigations. That tradition has not been strong in Sweden. Instead the Swedish society has an ‘old’ state tradition for internal state investigations with independent investigating institutions as the Parliament Standing Committee on the Constitution (*Konstitutionsutskottet*), the Ombudsman for Justice (*Justitieombudsmannen*), the Chancellor for Justice (*Justitiekanslern*) and in general the committee service has served the tasks connected to disaster investigations.<sup>78</sup> In a Norwegian report on governmental investigative commission reports it was claimed that in Sweden one can find a higher degree of trust in the internal state investigation establishment, consequently there are fewer discussions on the findings of these reports than on equivalent reports in Norway.<sup>79</sup> A concept like ‘civil servant honesty’ (*ämbetsmannaheder*), with its deep roots closely connected to Swedish state administration, might have contributed to the development of this confidence. In a younger state, like Norway, the possibilities to build up long traditions for a state administration have been weaker. For example, when the governmental investigative commission reports in the mid-1970s were to be formalized, it was important not to institutionalize the work on governmental investigative commission reports.

Correspondence between changing accident investigating organizations and changes in images of the risk society were not dealt with. The same is also apparent when we come to references for changing investigation methods or contemporary risk and safety research. The lack of pointing at research, method development or system understanding of accidents has been most apparent in the Swedish development.

In this connection the hypothesis that unique major accidents had an important impact on political decisions could also contribute to explaining the chronological discrepancy between Norway and Sweden. One explanation is that political changes occur as reactions to acute situations, rather than as well-planned and well-thought-out reforms. Thus we could claim that major and acute accidents, rather than accident understanding, trigger action and constitute *formative periods* when organizational changes become possible.

In fact, at one point we can explicitly find an accident that is claimed to play an important role for a political decision, when, in 1981, the State Catastrophe Board, is established in Sweden. The nowadays more or less forgotten fire catastrophe in Borås can be directly connected to this initiative. The next formative period is 1986–89. In 1986 both SHK and the State Catastrophe Board had argued for their continuation as two separate organizations. Then, after some years of silence, the Social Democratic government suddenly placed a bill in parliament proposing a multi-modal accident investigation board and even instituted new legislation. Sweden had changed after some unique events in 1986 (Olof Palme, Chernobyl) and 1988 (*Måbodalsoleckan*), and those events probably brought a new understanding of the consequences and the extensiveness of accidents. Two of the events even happened outside the country, but affected the whole Swedish nation both physically as well as mentally and permeated the entire society. The Swedish society had proven to have had difficulties with handling them and to be prepared for what followed from them. The fact that Sweden had nuclear power plants in operation

probably strengthened the risk perception. There are good reasons for presuming that the understanding of accidents and traumas was changing under the experiences from the scenario here described. In Sweden one learnt to understand accidents as something that could hurt society broadly and hard. It no longer gave any meaning to uphold an organization of separate and specialized accident investigating boards.

Holding on to the hypothesis of accidents as triggers for political decisions, one can observe that the first permanent accident investigating board was established in Norway in 1989 and was preceded by two major flight accidents; at the Torghatten (36 dead) and the aircraft accident with a Partnair flight (55 dead) off the Danish coast. But the year 2000 has to be considered as the turning point for Norway, when at last a report proposed the establishment of a multi-modal accident investigation board for the transport sector, even if it did not handle all major accidents. As we have demonstrated the idea had lived its own life through many reports from the mid-1970s. After 2000 the decisions came in rapid succession. This change in pace can be connected to the Åsta railway accident (2000) and the loss of the fast boat Sleipner (1999) on the Norwegian west coast, though it is not mentioned in the sources.

These explanations clearly show the societal embedment of these reforms. Further, one might rule out the traditional but loosely motivated understanding that Norway always follows Sweden, and thereby indicating that the Swedish state is more modern. This may instead indicate that Norway has *not* followed Sweden because nearly two decades is too long a time for claiming that one has 'slackened a bit in modernization'.

## Notes

- 1 Njå et al., *Hoyrisikogrupper i vegtrafikken*.
- 2 Beck, *Risksamhället*.
- 3 'Et sårbart samfunn'.
- 4 'Sikkerhet i en ny tid'.
- 5 In the university sector the activities in education and research are growing in this field. See, for example, Aven et al., *Samfunnsikkerhet*. This article is also an expression for this trend, as it is a product of a project on learning from accidents investigation financed by the Research Council of Norway.
- 6 Perrow, *Normal Accidents*.
- 7 Reason, *Managing the Risks*.
- 8 Røed-Larsen, 'Fra ragnarok til Rocknes', 188–9 and Lundberg et al., 'What-You-Look-For-Is-What-You-Find'.
- 9 Stoop, 'Divergence and convergence' and Røed-Larsen, 'Fra ragnarok til Rocknes', 188.
- 10 The separate organization for accident investigation in these sectors will be studied in another research project at the University of Stavanger, see note 5.
- 11 Stoop, 'Divergence and convergence'; Røed-Larsen, 'Fra ragnarok til Rocknes'; Røed-Larsen and Stoop, 'Major accidents'; and Salusjärvi, 'Utredningsstrategier av olyckor'.
- 12 Malmberg, *Haveriutredningar*, 665, 687.
- 13 Lundberg et al., 'What-You-Look-For-Is-What-You-Find', 1299.
- 14 'Et sårbart samfunn', 14–15; Hovden et al., 'I etterpåklokskapens klarsyn', 178; Røed-Larsen, 'Fra ragnarok til Rocknes, 190–1; and Stoop and Røed-Larsen, 'Public Safety Investigations', 1472.

- 15 Stoop and Roed-Larsen, 'Public Safety Investigations', 1474.
- 16 Anselm, *Rekordårens tbc*.
- 17 Malmberg, *Haveriutredningar*, 342ff, 361ff; 'Haveriutredningar', 145.
- 18 'Regeringens proposition 1977/78:88'; Malmberg, *Haveriutredningar*, 371.
- 19 Malmberg, *Haveriutredningar*, 361–2; 'Regeringens proposition 1977/78:88', 7ff.
- 20 Malmberg, *Haveriutredningar*, 423; 'Förordning med instruktion'.
- 21 'Haveriutredningar', 145.
- 22 Malmberg, *Haveriutredningar*, 403–4, 410; 'Haveriutredningar', 77.
- 23 'Haveriutredningar', 108–9.
- 24 'Regeringens proposition 1989/90:104', 15ff.
- 25 RA. *Räddningstjänstkommittén*. Volym 1, B2. Material 1979:1; Malmberg, *Haveriutredningar*, 411ff.
- 26 RA. *Räddningstjänstkommittén*. Volym 1, B2. Material 1979:6.
- 27 RA. *Räddningstjänstkommittén*. Volym 1, B2. Brev 23 okt. 1978.
- 28 'Därför gick det så illa'.
- 29 RA. *Räddningstjänstkommittén*. Volym 1, B2. Material nr 1979:1, RA. *Räddningstjänstkommittén*. Volym 1, B2. Brev 23 okt. 1978. A parliament motion with nearly identical wording was submitted in the parliament (*Motion 1978/79:336*).
- 30 'Undersökning av allvarliga olyckshändelser', 85.
- 31 *Ibid.*, 85ff.
- 32 *Ibid.*, 99ff.
- 33 'Regeringens proposition 1989/90:104', 20.
- 34 Malmberg, *Haveriutredningar*, 410.
- 35 *Ibid.*, 414ff, 428–9, 435ff.
- 36 'Statens katastrofkommission'.
- 37 'Haveriutredningar'.
- 38 *Ibid.*, 122.
- 39 *Ibid.*
- 40 *Ibid.*, 69, 145ff, 155–6, 168–9.
- 41 'Regeringens proposition 1989/90:104'.
- 42 *Ibid.*
- 43 Malmberg, *Haveriutredningar*, 450–1.
- 44 *Ibid.*, 65, 451–2.
- 45 *Ibid.*, 620–1, 708.
- 46 Koht, *Bruk av granskingskommisjoner*; Koht, *Administrative breakdown*; Koht, 'Rapporter fra norske granskingskommisjoner'.
- 47 Giertsen, *Gransking*, 12–13; Koht, *Bruk av granskingskommisjoner*; Koht, 'Rapporter fra norske granskingskommisjoner'; Koht, *Administrative breakdown*.
- 48 'Innstilling III', 357 and onwards; 'Undersøkelse av sjøulykker', 19–20.
- 49 'Om styrking av Flyhavarikommisjon'.
- 50 'Utredning angående etablering'.
- 51 *Ibid.*
- 52 'Lov om offentlige undersøkelseskommisjoner'.
- 53 Røed-Larsen, 'Fra ragnarok til Rocknes', 192.
- 54 Ministry of Communication and Transport, Archive. Vurdering av behovet. 1990 and Brev 1991.
- 55 Ministry of Communication and Transport, Archive. Brev 1993.
- 56 Vinnem, *Sikkerhet i Norge*, 38, 74. Røed Larsen (2004) called my attention to Vinnem's text.

- 57 *Storulykker, I.*
- 58 Supreme Court Judge since 1997, Director General, 1987–1988 and Permanent Undersecretary, 1989–1997 in Ministry of Communication and Transport.
- 59 ‘Undersøkelse av sjøulykker’, 66–7.
- 60 ‘Et sårbart samfunn’, 17–18, 217–18.
- 61 *Nasjonal transportplan.*
- 62 *Ibid.*, 52, 60.
- 63 ‘Innstilling fra samferdselskomiteen’.
- 64 *Utredning angående etablering*, 10; *Nasjonal transportplan*, 59.
- 65 *Utredning angående etablering.*
- 66 *Politisk grunnlag*, 56.
- 67 *Utredning angående etablering.*
- 68 *Ibid.*, 45ff.
- 69 *Ibid.*, 47. The same wording is repeated three times on page 46, 47, and 48 without providing a more precise content.
- 70 *Ibid.*, 40–1.
- 71 *Ibid.*, 57, 60–1.
- 72 *Ibid.*, 50ff.
- 73 *Utvidelse av Havarikommisjonen.*
- 74 *Ibid.*, 5.
- 75 ‘Lov om offentlige undersøkelseskommissjoner’, 46–7.
- 76 Giertsen, *Gransking*, 16–17, 27.
- 77 ‘Om styrking av Flyhavarikommisjon’.
- 78 Hirschfeldt, ‘Kommissjoner og andra undersökande utredningar’.
- 79 ‘Lov om offentlige undersøkelseskommissjoner’, 57ff.

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