

WHAT IS THE RELATIONSHIP BETWEEN THE INCREASED USE OF THE PENAL CODE AND SAFETY REPORTING

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ABSTRACT

This study shows a relationship between more forceful application of the Penal Code and a decrease in some fields of the willingness to report. The existing system, which was based on the voluntary and open reporting of incidents, led to sufficient information to improve safety. The present system is based on reporting incidents as mandatory by EU legislation, implemented through national rules.

Data for this study comes from 57 interviews and 35 questionnaires with persons working in aviation (controllers, pilots and management) and in the judicial systems (police, prosecutor and judges), as well as from the Aviation Authority, insurance companies, former members of the Accident Investigation Board and the media. To compare the situation persons from other safety sectors like the medical world were interviewed. Furthermore 165 reports from the Accident Investigation Board were studied published between 1958 and 2002. The relation with the changing culture has been given as well.

Given the body of data to prove the relationship between more forceful application of the Penal Code, my qualitative data shows a growing concern about our continued ability to improve safety in aviation. Information shows in the direction that safety improvements will become more difficult. The preponderance of evidence shows the difficulty in improving safety if we keep this situation. Possible improvements have been given in 30 points.

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THESIS

Prologue

During the course of the thesis investigation I showed a dilemma to one of the interviewees, a 28 year old female pilot who had an experience of approximately 250 hours and who was working towards her flight instructor rating. The dilemma was pointed out after she explained to me that she would answer in all honesty to the police about the circumstances under which an accident might have happened. The accident that we talked about was a hypothetical one, although based on parts from several accidents and incidents that had happened already.

The hypothetical case was an aircraft, here called A, on final for a certain runway in a right hand circuit, where another aircraft, here called B, overtook aircraft A on final by flying a shorter circuit, thereby overtaking her from the right hand side. This resulted in a full hit on final where aircraft A, piloted by my interviewee, was able to land and the other crashed and burned, killing its occupants.

During the (hypothetical) police interview after the crash she would explain that she had not seen the other aircraft and that it had approached her from the right. I told her that, after stating this information, she might be arrested for several articles in the Dutch Penal Code, among which involuntary man slaughter and destroying an aircraft by negligent behaviour. She was appalled at this information and told me she had never realized that she could be arrested by being honest about the causes and circumstances that led to this accident.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Executive Summary

This study has been started because of my specific interest in the existing tension between different investigations after accidents and incidents. Around the world accident and incidents in aviation lead to interest from the general public and the media. This in turn leads to the interest of several authorities, among which are accident investigation boards, authorities in the specific field and judicial authorities.

Having worked for the Dutch Aviation Police for some 20 years the tension between the investigations was known to me. From the judicial side accidents and incidents were seen through the eyes of regulations and enforcement, always related to the persons who were involved. Generally speaking: the captain as the person with the ultimate authority on board, is always responsible for the outcome, whether manipulating the controls or not. In these years I felt a growing discomfort about this situation. It became more and more obvious to me that the outcome is not always the result of the actions of the captain. This discomfort came from big and small accident that I have investigated in the years in the police, as well as offences from pilot that were seen. It was not always the captain who was to be held accountable in a judicial sense.

My change of job to Air Traffic Control the Netherlands gave me the opportunity to do the investigations in a different way and to come to recommendations for safety improvements. It was more than obvious that front line operators, like pilots and air traffic controllers, do not come to work to err; they are proud of the job they do and they want to do it as best as they can. That the outcome is different from what is wanted, cannot always rest on the shoulders of these operators. The work of an operator is done in an environment which the operator cannot always change: the setting of the cockpit or his ATC environment, the weather, environmental issues that have an effect on his work, airspace lay out and restriction all play a role in the day-to-day work.

During my study with professor Dekker at the Lund University I became more and more convinced that the systems issues leading to incidents and accidents, have to be known in order to make aviation safer. An example of this given in paragraph 4.5: punishment in both the mentioned cases whether coming from a disciplinary board in 1969 or from the prosecution in 2006, will not be of help to improve the system. In the case of the 2006 incidents that is mentioned the airliner did not respond to questions that were raised in order to find the system issues that might lead to improvements. Foucault was right and to paraphrase him: punishment does not make a better person.

This thesis is concentrated around the tension between the judicial investigations after an accident or an incident and the willingness to report. Although judicial investigation have their place in society, I wanted to establish whether they had a function in aviation safety. The investigation has learned that operators are willing to talk about what has happened in an accident or an incident to a level that they will incriminate themselves and that they will not seek any legal advice before talking to judicial authorities. The chances of being prosecuted are increasing from then on. The downside of this is that they will no longer openly talk about the why's and how's of the circumstances surrounding accidents and

incidents for fear of prosecution, amongst other reasons. This in turn will lead to less possibilities to improve system safety.

The results of this study have been set in the changes that are going on in society around risk. Where risk was an accepted part of society it has changed in the direction of precaution, where risk in socio-technological environments has to be eliminated. In aviation, where learning has come from open sharing of information and from improvements after accident and incidents, it is doubtful whether big steps will be made in the near future to come to big steps in safety. Risk is always there and accident will always happen. The precautionary culture might be less helpful to come to improvements in aviation safety. Taking into account the interviews from other safety sectors, the same might be true for those sectors.

Improvements are possible. All in all 30 possible ways of improvement, coming from all parties that were interviewed, have been found and are directed to several parties:

1. the legislator (i.e. the European Parliament for Europe and/or the national Parliaments for the European States) shall have to decide which of the several investigations has precedence in order to create clarity: is safety leading or not;
2. the legislator should take a clear position as to the use of final reports of an Accident Investigation Board on (judicial, civil or administrative) proceedings, be it as evidence or as steering information;
3. improvements in legislation must clearly indicate which data is protected and when the judicial authorities are allowed to use these data;
4. reconsider article 5.3 of the Aviation Act: as there is no norm in the article it is applicable to almost every behaviour in aviation and this is seen in jurisprudence in the Netherlands, which makes the article useless;
5. front line operators should be trained from the start in the ethics of their profession;
6. front line operators should be informed during (initial and recurrent) training about their legal position and the consequences of the several positions;
7. front line operators should be informed about the possibilities to receive legal advice from a lawyer;
8. front line operators should thoroughly read and comment on draft reports of Accident Investigation Boards in conjunction with a lawyer;
9. front line operators should make a note of the event, as it is reminded directly after the event, in order to use this during the investigations;
10. front line operators should realize that their statements can be used for different proceedings and that they can have a different connotation;
11. front line operators should realize that assessments about their acts are done by people outside aviation, often from the paperwork that has been handed to them, and should therefore not hesitate to use experts of certain domains;
12. front line operators should be competent and maintain a level of competency in their work by knowledge of the correct procedures and reading incident related information to improve their competence;
13. prevention of errors is a responsibility of organizations, to be reached through investigations after reporting of incidents;

14. organizations do not need incidents to come to improvements: they can make them when they realize that “the holes are in the system”;
15. front line operators and organizations should realize that the police and prosecutorial authorities have a task in society which can not be removed;
16. organizations should cater for sufficient personnel to perform the investigations after an incident has been reported and should take care of feedback to the reporters;
17. organizations in aviation and the police and prosecutors should try to come to an agreement which cases are to be prosecuted and which not, based on clear criteria, in order to take away the fear in aviation that people can be prosecuted for almost any incident, reported or not;
18. organizations have a role towards the safety climate in the organization as well as in society, and the view that society has towards these organizations, and the organizations should take the lead in exchanging safety related information between organizations and with society;
19. the presumption of innocence should be the start of an investigation;
20. prosecutors should act with great care and reserves when selecting cases that are to be prosecuted, especially in the international world that aviation is and prosecutions are known outside the country of prosecution;
21. the judicial system must have the trust in the aviations sector that improvements are possible and are made without punishment of front line operators, that honest mistakes are made by normal people doing their normal job, but that gross negligence should be punished;
22. legal people, like prosecutors, lawyers and judges, should be trained in human factors and human error, and should become competent in the world of aviation;
23. aviation authorities should be careful with more regulations as they might lead to more ways to not comply to the rules without people realizing that they do not comply;
24. aviation authorities could be helpful in the formal exchange of incident information in order to improve aviation safety;
25. aviation authorities have to work with all parties in their world to re-establish the open culture of reporting incidents;
26. the aviation world should realize that immunization against prosecution is not a solution and that there is a legal indisputable right for the prosecutor to prosecute cases within his or her discretionary space;
27. aviation world has to work with all parties in their world to re-establish the open culture of reporting incidents;
28. investigating agencies should not battle for competence, but cooperate;
29. more attention has to be given for human factors and human errors in investigations of accidents and incidents;
30. in the end people have to accept the consequences of their actions when work is performed in a risky environment, even when the outcome is a negative outcome.

It is my hope that this thesis will help with the improvements.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Chapter One: Introduction

It was Plato who, five century before BC, raised the subject of our knowledge and wrote the allegory of the Myth of the Cave (Plato, 1991). Plato wrote about people who live in a cage, chained in such a way that they were not able to look behind themselves. A light behind them caused shadows on the wall, the only place they could see in front of them. The origin of sounds as well as any idea about the world around them, these people would believe, came from the shadows that they could see moving on the wall in front of them. The shadows became their real world, not having seen the light of the other world that was as well the origin of the shadows.

The Air Line Pilots Association of the United States stated in a report (Roitsch et al., 1979) the following recommendation: *Attention should be drawn to the negative effect which fear of legal consequences has on the full disclosure of all factors which may have contributed to an aviation accident or incident.*

This report was made after the collision of two Boeing 747's at Tenerife's Los Rodeos airport on March 27th, 1977. This collision, which at present still stands for the most severe accident in the history of aviation, marked the start of what is at present known as Crew Resource Management or CRM (Helmreich et al., 1999; Helmreich et al., 2000). CRM was developed after this accident in order to improve crew member interaction to minimize the probability of human error. CRM is widespread in aviation industry at present; human errors still occur.

A small jump in time brings us to August 2008 and Mike Ambrose, director general of ERA, wrote (Ambrose, 2008): *The Minister of Justice had trained himself to appear unruffled at all times and, under the circumstances, had taken the news quite well. His aide had rushed him to the airport after informing him that his wife and daughter had both been seriously injured in an aircraft landing accident. He was able to handle the scene of controlled chaos and emotional distress at the airport. What shattered his composure was a chance remark overheard from a group of pilots gathered close to the airport's room for concerned relatives: "I have always thought this would happen. I nearly made that mistake myself but I knew that if I made an official report about it, it could be used against me."*

It was a hypothetical case, Ambrose added, although I could have written it myself. But is there any progress made between 1977 and 2008? And if not, why is that? Are we still able to change things for better in aviation safety? Talking about a culture of safety, about Just Culture, how can we deal with it when criminalizing errors is, like the mythical sword of Damocles, right above our heads? And is this just aviation, or also other industries where safety is an issue?

I should like to elaborate on this in my thesis. The thesis investigation is based on the investigation that is being done after an accident or (serious) incident has happened and the investigations that are being started. Several authorities appear at the scene of the accident or incident, very soon after it or some time later. Are there implications for the safety investigations, for progress on safety, for safety management?

To benchmark this problem, I also looked to other safety related industries: the medical world, a ships pilot, railroad safety.

This thesis is built up in the following way:

chapter 2 holds some background information and the methodology that is followed;

chapter 3 gives background information about the thesis subject;

chapter 4 holds a survey of reports of the Dutch Aviation Safety Board and its successor between 1958 and 2001, including the applicable legislation;

chapter 5 shows an overview and the results of the interviews that were performed spreaded out in different paragraphs for the different groups and functionalities;

chapter 6 has the analysis of the interviews;

chapter 7 holds information about other worlds, elsewhere around the globe;

chapter 8 holds the discussion follows after the analysis

chapter 9 has conclusions.

Finally a list of abbreviations is added and the reference list can be found in the end of the thesis. Appendices with the questions for the different groups of persons, examples of the accidents and incidents in which people were involved and a timeline.

I should like the opportunity to thank some people. At first my wife, Annemarie, who supported me in over all the years of working in aviation and in doing what I believe what is right to be done. Then, not less important for my study, is professor Sidney Dekker, who also inspired me to walk the road that I started in the 90's, without his knowledge, when I came out of "the dark ages" of law enforcement and applied a "no immediate penalty rule" in my everyday work in the Aviation Police in the Netherlands which in the end has led to this thesis. Thanks to the people who inspired me while doing my work for Air Traffic Control the Netherlands. I also want to thank those people who have taken the time to be interviewed for my thesis: their support, enthusiasm and disclosures were overwhelming. Without them, this thesis would not have been here for you to read.

Chapter Two: Background Information and the Methodology

Paragraph 2.1: Introduction

Aviation can be seen as an activity that has an inherent risk: when flying is not performed in the correct way i.e. as a balance between engine power and aerodynamics, it is quite easy to crash and die. Since the inception of aviation people have tried to avoid to die while flying. Accidents have led to new rules in order to make aviation safer than before a specific crash. Together with the spread of information on accidents and rules in the international world that aviation is, it has become safer and safer.

The rate of accidents in aviation has dropped to a point where the possibilities for further improvements is becoming more difficult. Boeing Commercial Aircraft published figures (Boeing Commercial Airplanes, 2008) and the statistical part of this information showed a downward and slowly flattening rate of accidents. The figures below are from the mentioned document and are presented with permission from Boeing.

All Accidents – Worldwide Commercial Jet Fleet

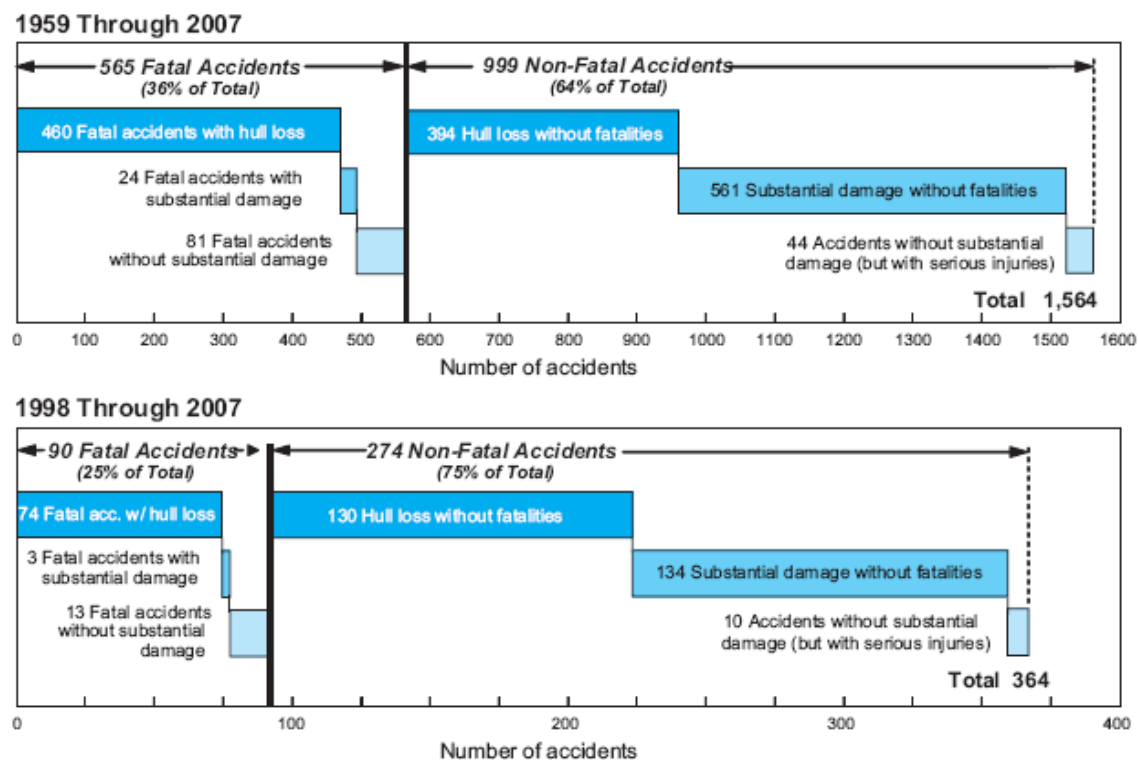


Figure 1: figures from Boeing Commercial Aircraft showing a downward and flattening rate of accidents.

The figure here above shows the numbers of all accidents worldwide between 1959 and 2007 (top of the figure) and the numbers of all accidents worldwide between 1998 and 2007. As can be seen, in the majority of cases the accidents are non-fatal.

Worldwide Commercial Jet Fleet – 1959 Through 2007⁷

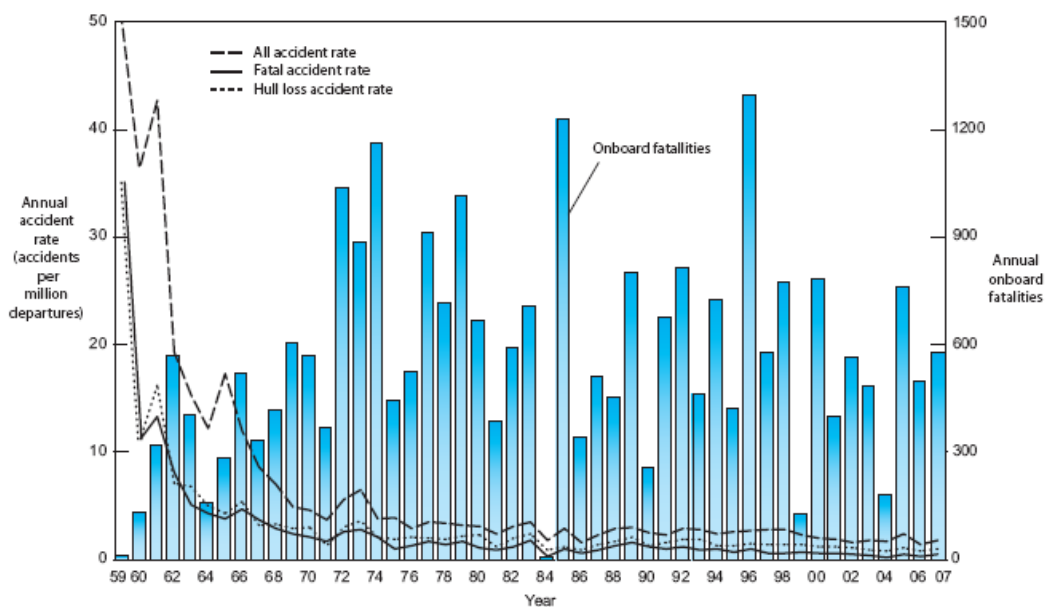


Figure 2: the accident rate over years between 1959 and 2007

Of most interest in figure 2 is the accident rate over the years: the annual accident rate (as in accidents per million departures) is decreasing over the years for all accidents.

Figures vary between sources, but it is mentioned that between 70 to 90% of all accidents are caused by human error. Organisations have been looking towards incidents to come to gains in safety. Incidents are not always visible to the general public nor to the judicial authorities. But every now and then an incident might come to the attention of these authorities. This is often unwanted by the organizations that are involved in the incidents, but once the attention has been drawn, it is (very) difficult or impossible to change the course of the judicial authorities.

Incidents can be prevented more effectively if they are reported in order to investigate them and improve the system. Reporting will only be done in an environment where front line operators have trust in the reporting system and where they understand that honest mistakes are not punished, inside or outside their own organization. The front line operators also must know that wilful acts are not tolerated. This is known as the atmosphere of Just Culture.

I specifically state “atmosphere of Just Culture” as there is no internationally agreed definition of what a Just Culture is. In chapter six more information is given about this problem of the definition of Just Culture.

Paragraph 2.2: the legal framework

The International Civil Aviation Organization (ICAO) is the organization that started in 1944 after 54 countries signed the Chicago Convention (ICAO, 1944). Countries agreed that investigations would be performed after accidents happened and specific procedures about these investigations have been drawn up and adapted over time in Annex 13 of the

Chicago Convention (ICAO, 2001). As stated in article 3.1 of this Annex, “the sole objective of the investigation of an accident or an incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability”. From the wording of this article it can be deduced that safety and improvement of safety is the top priority in the investigation process and that judicial or disciplinary proceedings as well as tort liability is subordinate to this.

As States, who have signed this Convention, have the obligation to adopt the regulations and procedures of ICAO to the highest degree of uniformity (ref. article 37 of the Convention), part of these regulations being the investigation of accidents and incidents, the national legislations have to conform to Annex 13. Annex 13 was first adopted by ICAO in April 1951 and Van Vollenhoven has stated that the motivation to come to independent investigations of accidents or incidents has been that the judicial investigations were not the appropriate instrument to find the causes of accidents and to come to preventive measures (van Vollenhoven, 2001).

Apart from ICAO the European Parliament and the Council have agreed on and published several directives about the investigation of accidents and incidents, which are all based on Annex 13 of the Chicago Convention (European Council, 1994) (European Parliament and the Council, 2003).

The objectives of Annex 13 must therefore be visible in the national legislations in the States that have signed the Chicago Convention, the Netherlands being one of these States. That the improvement of safety is the main purpose and that investigations with any other goal are subordinate to this, ought to be visible in the national legislation.

In a very readable article about enforcement and rules Etzioni stated that “lots of people who have not studied the subject, are of the opinion that people behave in a pro-social way out of fear for punishment for anti-social behaviour. This assertion is not tenable. Many forms of pro-social behaviour are not related to legislation; we do as is expected and refrain from misbehaviour out of carefulness or love”. He furthermore stated in this article lot of investigations have shown that in well-organized societies most people behave pro-social because they follow their internalized feelings for good and bad as well as their senses for duty and responsibility (Etzioni, 2009).

Paragraph 2.3: Hypothesis

The idea explored in detail in this thesis is that is not just the fact that people are being prosecuted and convicted or freed of all charges, but also the fact that an investigation has started by the judicial authorities, that threatens the possibilities to improve aviation safety. Damocles’ sword hangs above one’s head from the start of the investigation of the judicial authorities. There is data to suggest that colleagues in a company will think twice before reporting the next incident (Brüggen, 2003) and once the word spreads outside that specific company, others will follow. The result is less reporting which leads to less investigations and less possibilities to improve safety in a system or high risk organization.

Less reporting has been seen after the Delta case, where three front line operators from Air Traffic Control the Netherlands were tried and convicted in court and the number of reports dropped significantly (Brüggen, 2003). Only those reports were made where the reporter felt “comfortable” to report the incident i.e. without doing harm to anyone.

Other reasons for not reporting incidents that have been mentioned in reports and articles are: shame, trust in the organization, loss of position (Annas J.D., 2006), time pressure, fear of punishment, lack of perceived benefits and peer disapproval (Leape, 2002). Other reasons for reporting can be that the incidents or parameters used in surveillance equipment are used to check conformity to procedures. This might lead to selective attention with an increased focus on the measured items, as reported by Tamuz (Tamuz, 1987).

Hypothesis 1: the start of a judicial investigation, whether followed by prosecution or not, of front line operators will lead to fewer reports about incidents. Are the judicial investigation and prosecution a reason for not reporting incidents?

This thesis further explores up to which level those people who are involved in incidents and accidents are (not) familiar with the judicial system in order to prevent them to harm themselves or incriminate themselves in the first couple of hours after an incident or accident.

Hypothesis 2: people who are involved in incidents and accidents are not familiar with the judicial system to a level that prevents self-incrimination. They talk about what has happened to the judicial authorities without realizing that they can incriminate themselves.

Those people who are involved in incidents and/or accidents in aviation have the legal obligation to report these incidents and/or accidents in a way that is suitable for the appropriate authorities (European Parliament and the Council, 2003). However, reporting can only be achieved when several conditions have been fulfilled; one of them is the legal (criminal) liability of the reporter. He or she does not want to see the reported incident as the start of a judicial investigation that might lead to his or her trial and possible conviction. This has been reported in several (high risk) industries. The Dutch Procedural Legislation holds the principle of *nemo tenetur*: you are not obliged to incriminate yourself and therefore you have the right not to give a statement neither to the police nor to the prosecutor nor to the judge.

It is sometimes difficult for those involved in an investigation of an accident or an incident to find out what his or her position is in the several investigations. He or she might be an important player in the accident or incident as being one of the front line operators, which can lead to interviews from the own organization or an Accident Investigation Board, or both of these, while at the same time being a suspect in the judicial investigation. This may lead to a situation where the person involved will be reserved or unresponsive, being afraid to get into legal troubles (Nijboer, 2001). This is more or less a “Catch 22”-situation. This threat of a prosecution in relation to the reporting of incidents is known as “collusion”.

Paragraph 2.4: NASA's ASRS

In the United States a reporting system has been set up for aviation, which bases its success on three factors:

- 1) reporting is safe: when a report is made within a certain period of time after an incident, a pilot is immune from (disciplinary and legal) actions;
- 2) reporting is simple: just a one-page report is made;
- 3) reporting is worthwhile: pilots and the FAA receive the information after an analysis with recommendations.

More than 30.000 reports are being received and analyzed each year. Reports are provided by pilots, air traffic controllers, cabin attendants and ground and flight engineers. This system is known the NASA Aviation Safety Reporting System, which started in 1975.

Reports are submitted voluntary by pilots, air traffic controllers, flight attendants, mechanics, ground personnel and others involved in aviation operations. Reports are held in strict confidence and over 700.000 reports are stored in the ASRS database. The FAA will not use the information from the database against a person in enforcement actions. Penalties and fines are waived under certain conditions for unintentional violations of the regulations (ASRS, 2009b). The FAA has issued an Advisory Circular in which the procedure of submitting a report and responsibilities of parties are stated (Federal Aviation Administration, 2000). One of the limits of the immunity are stated: there is no immunity and no de-identification of the report in cases of criminal activity (ASRS, 2009a).

Paragraph 2.5: Free will or determinism

One assumption underlying the work in this thesis and this assumption related to the question whether the human being has a free will or is determined. This has always attracted my attention as this is a question that is not only to be posed during work in a safety related environment, but is applicable to all aspects of life.

In it's most extreme form, one could state that everything in life is made outside oneself, as a human, and that one can do nothing else but sit and ride as things come and go. The opposite of trying to behave like a determined person or stating that there was no free will, leads to the conclusion that successes and progress are made by human, and that they are not determined.

Related to the free will is the idea of the discretionary space: the space a front line operator has while performing his or her job, doing those things that have not been specifically written down in rules and regulations or procedures and that finds its basis in knowledge, skills and experience gained while doing the job. This discretionary space can only be filled by the human doing the job but is full of ambiguity, uncertainty and moral choices. The discretionary space motivates people to do their work to the best of their abilities. This space, filled by an operator, in turn leads to the possibility of being prosecuted and blamed when incidents or accidents happen: in hindsight it is stated that the operator did the wrong thing. Discretionary space is therefore directly related to the choices operators make: the free will to act or not to act.

The starting point in this thesis will be that human has a free will and is able to choose in the activities and decisions that he or she makes within the environment where work is being done with the tools that are available: reporting is being done because people choose to report. They also have the power to not-report incidents, even when they are severe.

Hypothesis 3: front line operators have the free will to report or not report incidents, even when the incidents are severe.

Paragraph 2.6: Methodology for this thesis

The first part of the thesis represents the period between 1958 and 2001. Accidents and some incidents in this period were investigated by the Netherlands Aviation Safety Board (in Dutch: “Raad voor de Luchtvaart”) and its successors Netherlands Transport Safety Board (in Dutch: “Raad voor de Transportveiligheid”) en Investigation Board for Safety (in Dutch: “Onderzoeksraad voor Veiligheid”). A report from 1958 was the oldest one that could be found and the reports of the year 2001 were the last ones to be incorporated in the thesis investigation because of time constraints.

The purpose of this investigative retrospect was to set the reports of accidents and incidents in their time with the legislation of that time, including the changes in legislation that were made in that period, while they are also set in the culture and changes of culture in that period.

The second part of the thesis deals with the results of interviews and questionnaires. Interviews were held with pilots and air traffic controllers who had experienced an accident or incident after which (at least) two investigations were performed. These investigations had to be either from their own company or the Accident Investigation Board on one side and from the police and/or prosecutor on the other side. A prosecution was not necessary for the purpose of being interviewed. Persons from this group came from several sectors in aviation: from balloon pilots via (commercial) pilots, instructors and management in general aviation to commercial pilots and management in commercial aviation, with experience over a very long period of time.

The purpose of these interviews was to establish the experience of those involved in judicial investigations (with or without prosecution) and whether they had enough legal knowledge to not incriminate themselves. Their experience is related to hypothesis 1 and 2.

Interviews were also held with pilots and air traffic controllers who had experienced incidents but were not confronted with investigations outside their own company. This group functioned more or less as a control group, in order to find whether the investigations that were performed against the pilots and controllers in the previous mentioned group, had any effect on their behaviour. This group was also of interest in order to find why people do (not) report incidents.

Around these two groups questionnaires were sent to student-pilots. They all had received their theoretical training for the ATPL and were about to pass their theoretical exams, amongst which was Annex 13 of the Chicago Convention (the Annex that deals with Accident and Incident Investigation) as this is part of their Learning Objectives as stated in the JAR-FCL. This group is also questioned because of the fact that they are the next generation of pilots, aged between 19 and 33 years, with no or very limited flying experience, none of them being in the possession of a pilot license. They might (at least partially) be seen as “children from the generation of the precautionary culture”.

In a circle around these groups I placed a diverse group (in chapter five divided) and this group concentrates around the police and the prosecutor (in this case the Dutch prosecutor who has the coordination of aviation cases) as the enforcement agencies, lawyers who defended some of the pilots and air traffic controllers of the first group, two judges who were familiar with safety investigations as well as the Penal Codes, one being a judge of instruction with personal flying experience. These three categories complete the circle of prosecution, defending the prosecuted and sentencing the prosecuted.

The Civil Aviation Authority can also be found in this circle as well as people who spoke on behalf of insurance companies. The idea of the latter was that they also could play a role, albeit limited through policy clauses, in safety management of organizations.

The last parts of the circles were intended to hold at least four Members of the Dutch Parliament, from each major party in Parliament one Member who deals with Transport. Only one Member agreed for an interview. Despite the fact that a crash of an airliner led to lots of publicity in the period of my thesis investigation and the media attention which was given to the problems surrounding this investigation¹, the other three MP's did not agree to be interviewed.

¹ The crash that is mentioned here is the crash of flight THY1591 on February 25th 2009. In the days after the crash it became obvious for the media that there was a controversy between the Dutch Investigation Board for Safety and the Aviation Police with the prosecutor, as both wanted to use the information from the Flight Data Recorder and the Cockpit Voice Recorder as evidence in the investigation. In the end the Board took the recorders with them for investigation. Despite the arguments, the MP's could not be interviewed.

Other interviews were held with three former members of the Netherlands Aviation Safety Board who were experienced in several fields, of interest for aviation safety investigations, and who were on this board for several years.

Furthermore interviews were held with two representatives of the media: one from a public network who was experienced as a journalist in newsgathering and also involved in a major aviation accident in the Netherlands, the other had experienced several big accidents inside and outside aviation.

Outside the world of aviation but related to safety several interviews were held with persons working in the medical world (one cardiac surgeon, one eye surgeon, and one clinical trial data manager involved in trials with new medication). An interview was held with a representative of a safety advisory organization who had experienced several investigations where Penal Codes and safety crossed each other. Also one ships-pilot was interviewed. These interviews were mainly done to gather data that could be compared to aviation and to see whether lessons could be learned from these industries.

The figure below gives a graphic view of the groups, here divided into groups:

- group 1: pilots from several disciplines in aviation and air traffic controllers (ATCO's) who have experienced investigations from an Accident Investigation Board and police;
- group 2: pilots and ATCO's who have experienced incidents which have or have not been reported, but who have not experienced an external investigation;
- group 3: a questionnaire among student pilots who have studied the theoretical part of the ATPL;
- group 4: Aviation police and the public prosecutor for aviation incidents and accidents;
- group 5: lawyers who have defended pilots and/or controllers after accidents or incidents;
- group 6: two judges who have experience with safety related cases;
- group 7: a director of the Dutch Civil Aviation Authority;
- group 8: three former members of the Aviation Safety Board;
- group 9: two representatives of the media;
- group 10: three representatives of aviation insurance companies;
- group 11: a Member of Parliament;
- group 12: people outside aviation and working in a safety sensitive environment.

Selection of people in these groups was based on (for group 1) personal knowledge of the people being involved in an accident or severe incident and where a judicial investigation had been performed next to a safety investigation and where some cases have led to a prosecution; (for group 2) on the availability of people, spreaded among aviation; (for group 3) on the fact that I had partially trained these persons for their exams; (for group 4) on personal relation and introduction; (for group 5) on my personal knowledge that they were either involved in enforcement actions against pilots or air traffic controllers or their knowledge to add to this topic; (for group 6) on personal relation and introduction; (for group 7) on personal relation; (for group 8) on personal relation; (for group 9) on introduction through a third person and personally approaching a person; (for group 10) on personal relation and introduction through a third person; (for group 11) on

introduction through a third person; (for group 12) on personal relation and introduction through a third person.

The complete group is a representation from today's aviation in the Netherlands.

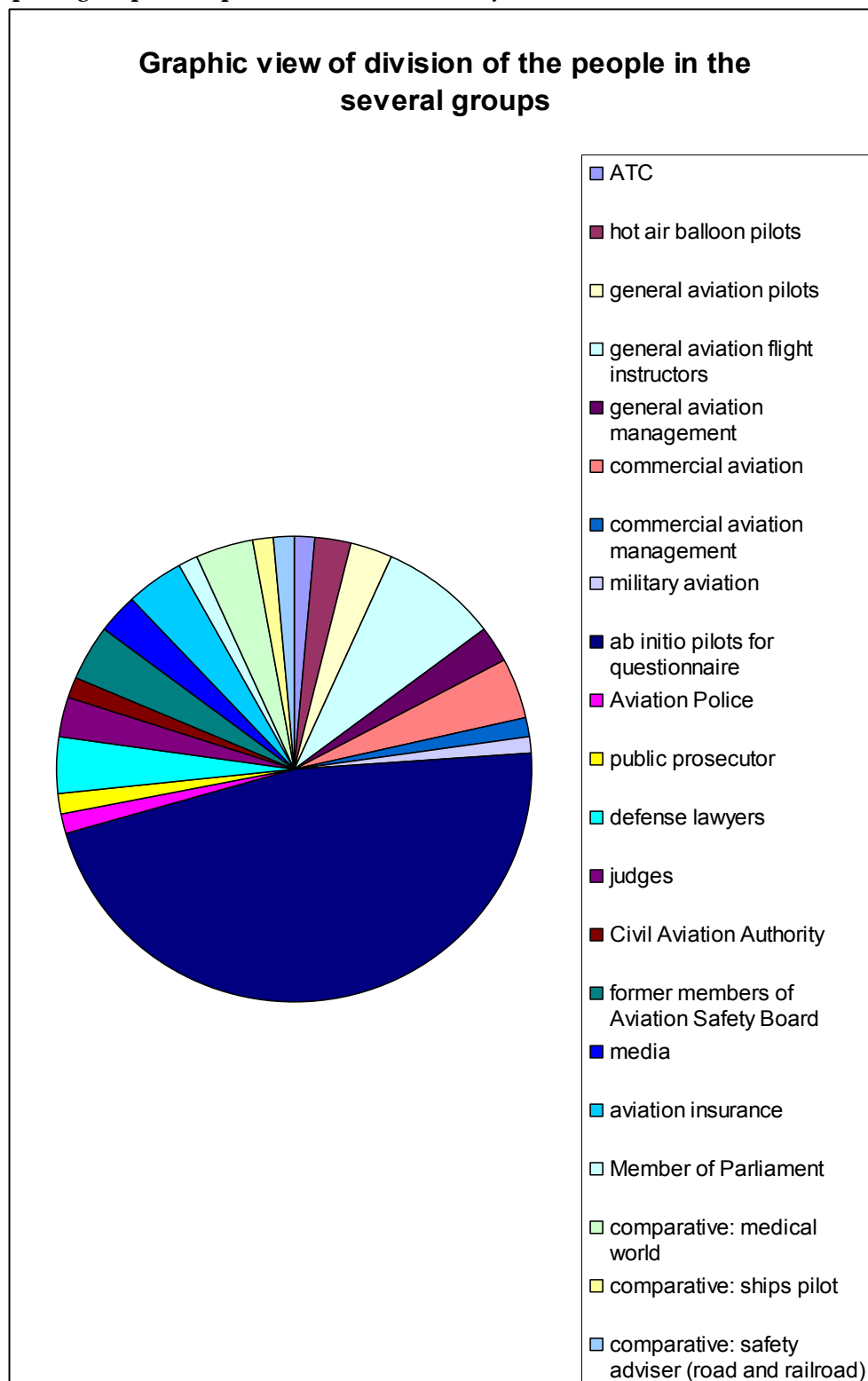


Figure 3: graphical representation of the groups of people that were interviewed.
The colors indicate the several groups.

Groups 1 and 2 were divided as indicated in the following figures.

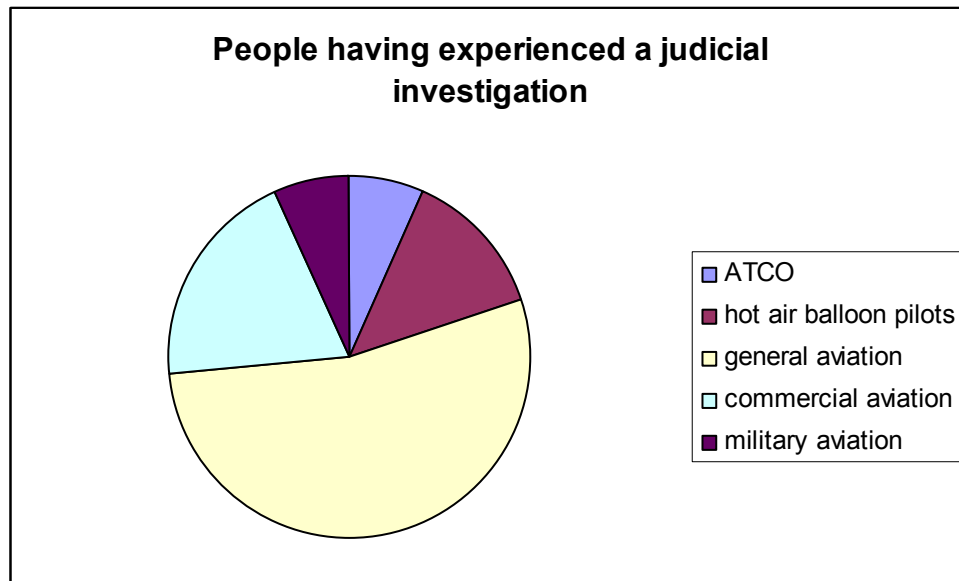


Figure 4: graphical representation of group 1.

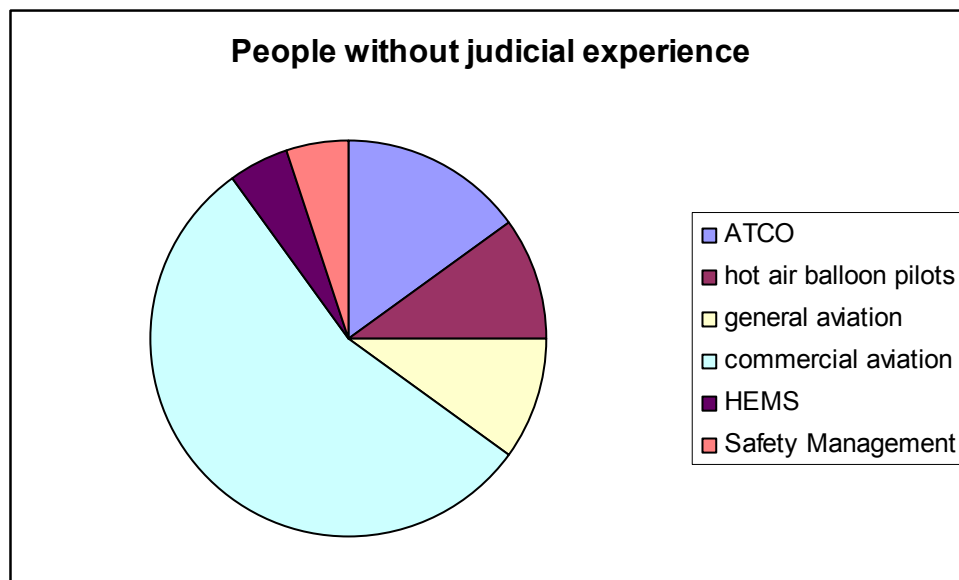


Figure 5: graphical representation of group 2.

By using this division into groups it was possible to group opinions within a specific domain or with a specific experience and to combine people in certain groups in relation to their own position in a system domain.

Interviews were performed by taking notes during the interview in an interview report. This report was sent to the interviewee after the interview and feedback was requested on this report. The interview report with the feedback and the approval of the interviewee to use that (agreed) interview report is used in this thesis.

Anonymity was guaranteed before the interview was done as there always is a chance that the information from the interview might harm the interviewee.

Despite anonymity and precautions that the identity of the interviewees was not made public, several very interesting interviewees did not want to be interviewed. Reasons for this were mainly that “the case was closed, I want to continue my life” or “the case is still under the judge, maybe that an interview might have negative consequences”.

The lengths of the interviews varied from 1 hour up to 4 hours.

It is remarked that the term “front line operators” is used to indicate those people who perform the actual work as pilots or air traffic controllers. It is also remarked that I have strived to use as much as possible the term “Accident Investigation Board” to indicate any Board that acts on the basis of Annex 13 of the Chicago Convention, whichever the name in a State is during the period that has been investigated in this thesis.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Chapter Three: Background information about the thesis subject

This chapter contains information about the background against which this thesis was made. Presented in this chapter are:

- risk in society
- on rules and regulations in society
- accountability and responsibility.

They can be seen as the line of reasoning to come to the questions for interviews, the analysis and the conclusions.

Paragraph 3.1: Risk in society

Two interesting works have been published in the Netherlands (in Dutch) in relation to risk and risk perception. These are "De voorzorgcultuur. Streven naar veiligheid in een wereld vol risico en onzekerheid" ("The precautionary culture. Striving for safety in a world full of risk and uncertainty") (Pieterman, 2008) and "Onzekere Veiligheid. Verantwoordelijkheden rond fysieke veiligheid" ("Uncertainty about safety. Responsibilities about physical safety") (Wetenschappelijke Raad voor het Regeringsbeleid, 2008).

Pieterman describes the history around risk (p. 4 ff), which starts with the blame culture where people had their own responsibilities when handling damages and shame and people at that time thought in terms of guilt and individual moral responsibility. At the end of the 19th century the risk culture is entering society: attention shifts from each individual incident to a level where all incidents with similarities are handled together. The third culture is the precautionary culture where moral judgments about incidents is returning and persons and organisations who are responsible for the application of technology are being held responsible for the risk attached to this technology. This culture started in the 1990's in the environmental protection field with a formulation of the precautionary principle and is spreading in other parts of society, amongst which is the way we handle law enforcement and similar problems of public safety.

The formulation of the precautionary principle which has the most momentum in society has been given in the *Rio Declaration on Environment and Development* (1992): "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." It has to be mentioned that the precautionary principle is not accepted by every government around the globe.

Pieterman states (p. 6) that one of the characteristics of the precautionary culture is the attention for uncertain threats which are not clearly demonstrable, measurable or calculable, and they often have a theoretical character, being represented as a future worst case scenario. Attention is further drawn to threats for which there is hardly any empirical evidence. There is furthermore a discrepancy between the way risks are being seen by experts and the concerns in society.

As for aviation a worst case scenario is a crash of an aircraft in built-up areas, which is not measurable and hardly calculable.

De Wetenschappelijke Raad voor het Regeringsbeleid (Dutch Scientific Council for Government Policy; here WRR) presented the precautionary principle as a new approach towards risks in society in order to identify potential risks and stated that it is a new paradigm with a new normative perspective. This paradigm is being formulated as follows: the vulnerability of human, society and natural habitat demands a proactive companionship with uncertainty.

The WRR also gave a direction for legal instruments to handle the precautionary principle in society, amongst which are:

- 1) an obligation to handle uncertainties by the government,
- 2) a framework of rules which is to be used by private parties who are involved in risky activities and handle their own responsibilities, and
- 3) to make the precautionary principle part of the Dutch Constitution, administrative legislation and tort litigation.

The burden of proof that an activity is handled with the necessary responsibility and is as safe as can be, is placed on the private parties. The WRR is of the opinion that private parties shall search for uncertainties in their activities and will transpose these uncertainties in calculable risks. It should not be the starting point then to forbid activities but to regulate them through licences and authorizations. These should be coupled to mandatory insurance of the activities to cover future tort claims. There will be a special role for independent judges who can give a normative framework through jurisprudence².

Striving to exclude small risks and uncertain threats in the future seems utopian. It raises the question which risks have to be mitigated and how they are mitigated as well as what are the uncertain threats. The critical element in the precautionary principle can therefore be "uncertainty".

Frissen stated that society used to have the principle of own responsibility where the actor who caused the damage was responsible, but that the WRR leaves this principle and heads into the direction of the precautionary principle where actors, private as well as public, have the obligation to take potential risks, uncertainties and ambiguities about risks into account when making decisions. This might lead to the conclusion that a risk analysis will lead to action based on the indicators. By introducing legislation the responsibilities are no longer an item for the government to act on, but also for every actor involved. He sees a danger in this: the totalitarian seduction that is just around the corner when government gives citizens an obligation will come very close to these citizens (Frissen, 2008).

² A small remark on this item from my side is that this statement about judges and judgments seems to include that judges have knowledge of the specific risk terrain they give their judgments about. I question whether the judges do have enough knowledge about these terrains, especially in aviation where judges give verdicts that lead to raising eyebrows.

Ericson has investigated this (what he calls) "politics of uncertainty" that leads to "expenditures on risk assessment and management that ironically reveal the limits of risk-based reasoning and intensify uncertainty" (Ericson, 2006). Ericson is of the opinion that we have lost faith in science and politics as mechanisms to control uncertainty and we take refuge more and more in strict control techniques and penal codes. This leads to more punishment, at the same time gives the suspected persons less guarantees in the trials.

The WRR, Ericson and Frissen state "uncertainties in risk" and I should like to remark that there is a contradiction present when uncertainty is related to risk. When a risk is known i.e. a risk is certain, it can be mitigated in some way (infrastructure, training, procedures or otherwise). But when a risk is uncertain, one could just as well state that this risk is unknown. How does one deal with unknown things? How far do we go with mitigating uncertain things? When a person claims that there is uncertainty in risk, this person also has more knowledge and knows which risks are uncertain to other people, sometimes without stating where this uncertainty is.

La Porte (La Porte & Consolini, 1991) wrote in 1991 already that "operators and watchful public assume, indeed insist, that some organizations can avoid system failures. Indeed, a number of regulatory agencies have been established in search of this happy condition", but he continues that "sustained failure-free performance is, from a theoretical view, quite extraordinary. From the literature, one cannot expect that it is possible." (p.20).

In the book "Ramp en recht Beschouwingen over rampen, verantwoordelijkheden en aansprakelijkheid" (Disasters and justice Observations regarding disasters, responsibility and liability) several interesting observations are noted:

at present there is a strong societal desire to indicate the guilty parties; there must be a scapegoat (p.222) (de Roos, 2001);

there is a more frequent and more insistent call on governmental authorities to protect citizens against all kinds of hazards, while these citizens deliver themselves to risky activities and proceed into hazardous situations (p. 229) (de Roos, 2001);

the assumption behind deterrence is that fear of criminal prosecution will suffice to ensure that fatal accidents will not happen (p. 235) (Hudson, 2001).

From the information presented above it can be derived that risk is at present seen by the public in a different perspective, which went from a perception where risk was accepted to risk which has to be prevented, more specific by governmental authorities. The first steps to introduce risk in other legislation than environmental legislation seems to come above the horizon. An example of this is the concern in general public about external safety: external safety for those who are not involved in an activity because they do their work (like in a petrochemical plant or a power plant) or because they travel (like in a bus, metro or a plane) and they are exposed to hazards. The idea is that those who work or travel in these environments, do this voluntary and accept the risks of these activities. But those who have to undergo these risk e.g. because they live in the immediate vicinity of a plant or airport, cannot or will not accept these hazards on a voluntary basis.

After the crash of the El Al Boeing in Amsterdam in October 1992 a debate has started in the Netherlands about this crash, the contents of the aircraft and the flight procedures during an emergency. Because of the turmoil around this crash, a Parliamentary Board of Inquiry was installed in October 1998 with the purpose to find the truth about this crash and to come to lessons learned for the future. In April 1999 this Board presented its findings with conclusions and 22 recommendations for the future, among which were (Parliamentary Board of Inquiry, 1999):

- recommendation number 2: the investigation of a major accident should reach further than just the establishing of the causes. Attention for the effects of the vicinity because of the accident and the possible societal effects should be an inherent part of the investigation and legislation has to be set up to accommodate this;
- recommendation number 4: the Board is of the opinion that in relation to external safety, it is recommended to take emergency situations into consideration. Possibilities to operationalize recommendation 10 of the Board of Aviation³ in relation to external safety have to be investigated. It might be considered to make the vicinity of an aerodrome and the built-up areas visible for air traffic controllers in cases of emergency⁴;
- recommendation number 11: the international definition of hazardous cargo in aviation is related to the possible hazards for crew, passengers and handling agencies. The Board recommends to also take into consideration in this definition the hazards related to safety on the ground and the consequences for public health;
- recommendation number 16: the Board recommends to the Ministry of Health and the Health Inspectorate to immediately give information to citizens and emergency services about the consequences that this disaster might have had on their health and well being. The advantages and disadvantages of future medical checks have to be amplified;
- recommendation number 17: the Board recommends that after disasters like the Bijlmer disaster, an epidemiological investigation is started.

The Dutch government accepted almost all of these recommendations and stated that they also were applicable in other disaster like the Enschede fire works disaster (May 13th 2001) and the Volendam New Years Night fire (the night of December 31st 2000 and January 1st 2001), both disaster with a lot of fatalities and serious injuries.

Another example on a different scale is the Seveso disaster: on July 10th 1976 several kilograms of dioxin were released in the atmosphere after the rupture of a storage vessel, which led to the death of tens of thousands of animals. As permanent effect on the health of human beings was established chloracne and there were inconclusive results for liver

³ This recommendation stated: "Expand the training of pilots and ATC personnel to include the awareness that in the handling of emergency situations not only the safety of airplane/passengers but also the risk to third parties especially residential areas should be considered.

⁴ This recommendation is a difficult one, as in cases of emergency a pilot will hardly consider the environment, especially when he is unfamiliar with the underlying terrain, and a pilot will try to land the airplane as safe and as soon as can be done. For air traffic control the procedure is to support the pilot as much as possible. Air traffic control is usually not in detail familiar with the type of emergency, as it is sometimes stated in broad terms because of lack of time to give detailed information by the pilot.

function and reproductive effects. Later studies uncovered an excess mortality from cardiovascular and respiratory diseases. The disaster itself led the European Community to draw up regulations on industrial safety, also known as the Seveso directives (beginning in 1982 and leading to changes, the last one in 2005 with tighter rules for industry and the handling of large quantities of hazardous substances).

Paragraph 3.2: On rules and regulations in society

Rules and regulations are part of our society which we cannot do without. They give structure to society as a whole, they lay down the morality that we have in a certain society and they provide security: we know what society expects from its civilians, we also know what the limits of our life are and we know up to what level the government intervenes within the individuals life. People in society are able to determine what to do and what not to do. Not following the rules and regulations would undermine society as a whole: society would be lawless. A lawless society leads to situations where the strongest will win, it might lead to anarchy.

Rules and regulations are made through the system of electing or nominating the people who act on behalf of the voters or civilians in society. On a small scale, it is the city council that draws up the rules and regulations of a city or town and on a bigger scale it is the assembly of members of parliament who draw up the rules and regulations for a country. On an international scale the representatives of the States are the voters of the city, who vote for or against a certain rule or regulation to be adopted in international law. Attached to the International Civil Aviation Organization (ICAO), one can see that each contracting State to the Chicago Convention has one vote in the Assembly of ICAO. In Europe, the European citizens elect the European Members of Parliament, who are then nominated for a certain term and together draw up new European rules and regulations.

In all these cases, the rules and regulations are drawn up to improve society as a whole and must lead to legal security, working in both directions for the citizens as well as the governing authorities. From a legal point of view it is undesirable that there is conflict between different laws as they lead to "legal insecurity".

In the international community rules and regulations are usually not enforced between the international organization and citizens of a certain State. Law enforcement is left to the authorities in a certain state which incorporates this usually in the specific legislation that regulates the behaviour.

The basis for the rules and regulations of the International Civil Aviation Organization is set through the Convention of Chicago (ICAO, 1944). This Convention is signed at present by over 180 States which thereby also state that ICAO rules and regulations, as they are laid down in the Annexes to the Convention, will be adopted in their national regulations unless ICAO has received a notification of deviation from the ICAO standards.

With respect to the prevention of accidents and incidents and in order to improve the overall safety of the aviation system as a whole, ICAO has also drawn up documents that give guidelines to air navigation service providers, aircraft operators and airports. It is not

useful to list them all. One exception is made for the Safety Management Manual (ICAO, 2006). This manual states one important part concerning reporting incidents: "Non-punitive reporting systems are based on confidentiality. Before employees will freely report incidents, they must receive a commitment from the regulatory authority or from top management that reported information would not be used punitively against them. The person reporting the incident (or unsafe condition) must be confident that anything said will be kept in confidence." (§ 7.3.5).

A remark is made for the position of ICAO towards the Just Culture. Information from Eurocontrol states that ICAO fully supports the concept of Just Culture. The Just Culture Task Force of Eurocontrol (consisting of representatives from Eurocontrol as well as several ANSP's) concluded (November 2008) that it was probably too early to formalise the term "Just Culture", which is still an evolving concept (Eurocontrol, 2008b). At present there is no globally agreed definition of "Just Culture".

The European Union and the European Parliament also have given several directives which are related to the reporting of incidents and accidents. The basis of all these directives are the Annexes to the Chicago Convention. The core of all these regulations are the following points (sources are indicated with a letter, given the first time the reference is mentioned):

- I. a high level of safety should be maintained (European Parliament and the Council, 1995);
- II. (A) the scope of investigations must depend on the lessons which can be drawn from them for the improvement of safety;
- III. (A) the purpose of the directive is to improve air safety by facilitating the expeditious holding of investigations, the sole objective of which is the prevention of future accidents and incidents;
- IV. (A) the investigations ... shall in no case be concerned with apportioning blame or liability;
- V. (A) a safety recommendation shall in no case create a presumption of blame or liability for an accident or incident;
- VI. (A) attached to the directive is a list of examples of serious incidents which have to be reported and investigated, amongst which are incidents spread out over ANSPs and aircraft operators;
- VII. (B) each member State should set up mandatory reporting systems (European Parliament and the Council, 2003);
- VIII. (B) various categories of personnel working in civil aviation observe occurrences of interest for the prevention of accidents and should therefore report them;
- IX. (B) the sensitive nature of safety information is such that the way to ensure its collection is by guaranteeing its confidentiality, the protection of its source and the confidence of the personnel working in civil aviation;
- X. (B) the sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability;
- XI. (B) Member States shall, according to their national legislation, take necessary measures to ensure appropriate confidentiality of the information received by them. They shall use this information solely for the objective of this data;
- XII. (B) without prejudice to the applicable rules of penal law, Member States shall refrain from instituting proceedings in respect of unpremeditated or inadvertent

infringements of the law which come to their attention only because they have been reported under the national mandatory occurrence-reporting scheme, except in cases of gross negligence;

- XIII. (B) attached to this directive are annexes which give information on the kinds of occurrences which are mandatory to report and it is remarked that every sector of the aviation community is mentioned for those incidents which the European regulator deems of importance;
- XIV. (C) an operator shall establish an accident prevention and flight safety programme, which may be integrated with the Quality System, including programmes to achieve and maintain risk awareness by all persons involved in operations; and an occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interest of flight safety (the scheme shall protect the identity of the reporter and include the possibility that reports may be submitted anonymously), and evaluation of relevant information relating to incidents and accidents and the promulgation of related information, but not the attribution of blame (JAR-OPS 1.037 (a) (1), (2) and (3) (Joint Aviation Authorities, 2007).

Eurocontrol also provides information on safety subjects to its Member States. Three of these are of interest to mention.

The first one is a report of a survey concerning legal constraints in relation to occurrence reporting (Eurocontrol, 2002). The objectives of the survey, that preceded the publication of this report, were to focus on legal constraints and on potential shortfalls in the national safety regulations that would not support "non-punitive" reporting in ATM², and a secondary aim was to explore other factors that might inhibit staff from reporting ATM safety occurrences for fear of being blamed or punished. The outcome of this survey was that there are significant legal constraints in many States and that, as a result, many staff feel inhibited to report. ATC organizations saw European legislation as a major enabler to implement non-punitive reporting, where a poor perception of safety regulators was another striking finding to emerge (p. 5).

The second publication is a follow-up of the first publication and is also concerned with the same subject. This publication is based on a Eurocontrol survey which started in mid-2005 (Eurocontrol, 2006b). The highlights of the outcome were that (pp. ii and iii):

- legislation is crucial to the development of aviation safety in general and of "just culture" in particular;
- the legislative framework is gradually improving, but in many States it still falls short of what is needed for aviation safety;

² Eurocontrol mentions "non-punitive" in this report. In the second mentioned report from 2006, Eurocontrol states: "non-punitive" does not mean that persons responsible for safety occurrences escape liability for unlawful actions, misbehaviour, gross negligence or violations. Instead, what is meant is a "just culture" where *front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated* and this is mentioned as the Eurocontrol definition of "just culture".

- the obligation to report occurrences (based on EU directive 2003/42) is not balanced by the protection of those reporting and these limitations were not seen as supporting the establishment of "just" safety reporting culture;
- there is a widespread concern about inappropriate judicial intervention in safety investigations that do not involve unlawful acts, misbehaviour, violations and gross negligence.

The third publication concerns the implementation of the Just Culture principles in ATM data reporting (Eurocontrol, 2006a). This publication states that an effective reporting culture depends on how organizations handle blame and punishment and that only a very small proportion of human actions that are unsafe are deliberate. Eurocontrol sees acts like criminal activity, substance abuse, use of controlled substances, reckless non-compliance and sabotage as deliberate unsafe acts. Eurocontrol states that a Just Culture is needed, an atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information and that the need for a Just Culture is generally not understood by many legislators and therefore not accepted within their State judicial systems.

Paragraph 3.3: Accountability and responsibility

Rules are also established to make people accountable. Talking about accountability means talking about accountability towards the organization in which a front line operator works, be he a pilot or an air traffic controller, an operator in a nuclear power plant, or a surgeon performing an open heart transplantation. Accountability is telling the story about what has happened and why it happened. There are more ways to be accountable, the most prominent ways of this being the accountability in court for either a criminal judge caused by an action of a prosecutor or a civil case (tort litigation) caused by an action of a harmed person or organization.

Is accountability the same as responsibility? Sharpe (Sharpe, 2004) uses the terms synonymously. But is this true? Accountability can be approached from the patient as in Simanowitz (Simanowitz, 1985). His belief at the time was that accountability in the medical profession is inadequate, which stems from the attitudes of doctors. He states that when a patient has a negative experience, the patient's trust will not be broken initially. But when the attitude of the doctor changes for the worse, that patient's trust is shattered. The reason, Simanowitz writes, for this is that if nobody wants to take responsibility, there is no accountability.

It could therefore be derived that accountability is the combination of responsibility (or feeling responsible) and attitude. The combination of both can then be seen present in someone who is emphatic and is open to the patient as far as mishaps are concerned. On the other hand: lots of people do remember a physician, whether it is a GP or a surgeon, who is almost inapproachable because of his attitude and who hardly is interested in the patient. So accountability and responsibility are in fact not the same, as attitude is part of accountability and not of responsibility. In air traffic control and airliner operations there also are people who are responsible for what happens, but do not want to give accounts after an incident, and this is part of their attitude.

Accountability is fundamental to human relationships, accountability is about trust (Dekker, 2007). He states: “Being able to offer an account for our actions is the basis for a decent, open, functioning society”(id. p.23). The question is whether the inability to offer an account of actions is related to an indecent society, a closed society?

Accountability cannot be seen as a panacea, according to Lerner and Tetlock (Lerner & Tetlock, 1999) and Dekker states that it is based on trust, as it is a fundamental human relationship. Acts of judicial authorities that request or require accountability from front line operators and who prosecute and punish these operators for doing their normal days work in normal circumstances, are seen as unjust. Dekker mentions this (p. 23) and furthermore mentions that it does not make organizations safer.

Paragraph 3.4: The problem described in this thesis and a symposium

In May 2002 a symposium was organized about the conjunction of the judicial, safety and enforcement investigations after a safety related event in aviation. Several parties expressed their opinions about this conjunction, and the following quotation come from the literal minutes of this symposium (2002):

- “When one can come after an independent investigation in the judicial system, this is the end of the independent investigation” (Van Vollenhoven, chairman of the Accident Investigation Board, p. 5);
- “The report of the (Accident Investigation) Board may not be used as evidence in a judicial process”(Van Vollenhoven, p. 5);
- “The writing of incident reports is part of prevention of accidents. The attitude of the Justice Department could lead an organization to say ‘We won’t write them any more’.”(Van Vollenhoven, p. 6);
- “At the end there is the question of which investigation has precedence. The nice thing is that the procurators-general are of the opinion that they have precedence, but there is no basis for this. I think that there is no precedence.” (Van Vollenhoven, p. 6);
- “Judicial investigations have their own value as well as independent accident investigations”(prof. Muller Leiden University; p. 9);
- “In case information is exchanged this has to be done according to strict documented procedures and public rules, where the involved persons realize what can happen with the information they give”(Muller, p. 11);
- When he was talking about the conjunction of the several investigations and the lack of clarity, E.R. Müller mentioned the diverse interests in the investigations coming from the safety, the judicial and the administrative sides and stated: “Everyone thinks from his own perspective and thinks that his investigation has the highest precedence. In the Netherlands there is no precedence arranged in the law” (E.R. Müller, chairman of the chamber for aviation of the Accident Investigation Board, p. 19);
- “After lots of arguments it was decided by the 180 States that form ICAO that the importance of safety investigations is of more concern than the importance of the Justice Department to come to a verdict based on the same information” (E.R. Müller, p. 21);
- “I am of the opinion that the public prosecutor has the precedence. That won’t surprise you. I think that it is in the interest of the independence of the Accident Investigation Board that the public prosecutor has the precedence.” (Nienhuis, prosecutor, p. 28);

- “The Penal Code has a great impact and one can see that the “Umwelt”, victims, next of kin, society in general, force great pressure on the judicial system, government in general, to act. This is a development that can be seen in the last decennium. It is an illusion to think that one can turn the Penal Code out of the house” (De Roos Leiden University; p. 31);
- “Penal Code ultimum remedium. Not suited to assess errors” (De Roos, p. 35);
- “When performing incident investigations human error is a chance to find the underlying systemic issues and to correct them; this requires a lot. We want a reporting culture. And report only come when people know that the reports will be used within a non-punitive system” (Kroese, chairman of an ANSP, p. 41);
- “The penal system is a strong treatment for a symptom, while what we are doing is to cure the disease”. (Kroese, p.41-42).

Chapter Four: Accident Reports of the Dutch Aviation Safety Board 1958 – 2001

In 1921 a crash happened near Flushing in the Southern part of the Netherlands. This crash appears to be the first registered crash of an airplane in the Netherlands which was severe enough to lead to an investigation. The responsible Minister of Waterworks contacted the Minister of Justice and proposed to draw up regulations for the investigations of aircraft crashes, which would at least have the following points of departure for a concept of the legislation:

investigations were to be mandatory;

a preliminary investigation was to be held immediately after the crash and eye witnesses should give their testimony;

the wreckage should not be touched or removed (van Dam, 1988) (Beumkes, 2006).

Paragraph 4.1: the Aviation Disaster Act

The Minister of Justice however replied that such legislation was not urgently required and the tool of “ad hoc commission” was used until formal legislation came into force which was from the 1st of January 1937: the Aviation Disaster Act (in Dutch “Luchtvaartrampenwet”) (Dutch Government, 1937). With several amendments this act was valid until the end of 1992, when it was superseded by the Aviation Accident Act (in Dutch “Luchtvaartongevallenwet”). At present, this last Act has been withdrawn and superseded by another Act, related to the investigations performed by the Dutch Investigation Board for Safety.

The Aviation Disaster Act stated that aircraft accidents had to be investigated by a Board and the board was given the power:

- to withdraw the license of a crew member of the duration of the investigation and eventually to restate a crew member in his duties (article 22 of this act);
- to come to proposals to prevent accidents (article 31 of this act);
- to come to disciplinary measures towards a crew member, ranging from reprimand to withdraw the license for a certain period, not more than 2 years in those cases where the board has come to the conclusion that an accident could be blamed to a certain crew member (article 37 of this act);
- to come to a disciplinary punishment when a crew member had misbehaved or had not complied with applicable legislation (article 37 of this act).

It was only in 1971 that all decisions of the board started to be published in the Dutch Government Newspaper (in Dutch “Staatscourant”). Before that time reports were published by the Board without publication in the Newspaper.

In my thesis I will only use the information that could be found from 1958 on. All legislation from before that day could not be retrieved. 1958 was also the first year that this Act was amended after coming into force in 1937.

The proposal to change the Aviation Disaster Act was discussed, especially within the circles of civil servants, for a period of some 25 years, where the main topic was whether disciplinary measures should be possible after an accident (van Dam, 1988). It led in the end to the proposal of the (then) new legislation in the form of the Aviation Accident Act

("Luchtvaartongevallenwet"), which was sent to the House of Commons on January 27th 1987. This legislation came into force, after debates in the House of Commons and the House of Lords, from January 1st 1993 (Dutch Government, 1992).

Paragraph 4.2: the role of the public prosecutor and the police

The role of the public prosecutor and the police has hardly changed in the period between 1921 and 1988, as stated by Schnitker (Schnitker, 1988):

- investigations were performed to find those people who did not comply to the law in a blameworthy way;
- accidents were investigated with casualties.

It can be stated that also after 1988 this role has not changed.

Schnitker further stated that Annex 13 (ICAO, 2001) did not hold any prohibition to perform judicial investigations after an aircraft accident or that a judicial investigation was to be subordinate to the technical investigation. He also stated that cause and blame can be the same but can also be separated from each other, and that not every aircraft accident in which human failure was established, had to lead to a prosecution. His expectation was that, with the removal of disciplinary punishment from legislation, the workload for the judicial system would not increase: the Penal Code is too broad to be used to establish whether "good airmanship" was absent in an accident and the Penal Code was, in his view, not suitable to take over the vacuum of disciplinary punishment. The judicial system with its investigations was competent and could carry the responsibility to investigate the deaths of people after an aircraft accident, based on common law with articles of the Penal Code, related to the societal safety, the general safety of persons and/or properties.

In this period only one accident could be found where a passenger died after a low flying part of a flight and the aircraft stalled and fell into a lake. Apart from the death of the passenger, the pilot was seriously injured and the aircraft destroyed. The Aviation Safety Board concluded that the pilot violated the altitude rules for this flight, was not sufficiently attending the flight progress and was guilty for causing the accident. His license for flying aircraft below a maximum take off mass of 2000 kg was revoked for a period of a year by this board. The Board also produced one recommendation in this accident (Raad voor de Luchtvaart (Netherlands Aviation Safety Board), 1990). Apart from this Board, the pilot was prosecuted but no records could be traced about the outcome of the prosecution.

Paragraph 4.3: New legislation in the Aviation Accident Act

When the Aviation Accident Act came into force as from January 1st 1993, the Netherlands complied to the then valid standards in Annex 13 i.e.

- 1) an independent investigation for the cause or causes of an aircraft accident and
- 2) an investigation that was to be "colorless" in answering the question regarding blame.

The possibilities for the Board to come to disciplinary measures towards members of the crew were deleted from legislation from that day on. The Minister of Transport and Waterworks stated, in the explanatory memorandum, that the Aviation Disaster Act was filled with questions regarding guilt, which were deleted in the new Aviation Accident Act.

In this last act the questions of the causes of an accident should not be mixed with those related to guilt and negligence. The reason for this was that the pilot is the easy identifiable part of an accident while lots of others could be involved in the accident chain.

The Aviation Disaster Act (period 1937-1992) gave the Board the obligation to give a public verdict about the accident and the possibility to give recommendations to improve aviation safety. There was no mentioning whether the verdict could be or not be used in other court cases. As the president of the Board was also a member of a Dutch judicial court, the investigations were done as if they were court cases in a criminal court. The verdict were also published with the personal details of the pilot or pilots that was or were involved in the accident.

In this same period the United States published Air Commerce Act (first in 1926, amended in 1934 and 1937) and the amendment of 1937 had a prohibition for the use of report of the Secretary of State (at that time authorized to hold hearings to inquire into the facts and circumstances surrounding aircraft accidents) in any suit or action arising from any accident (Miller, 1981).

The Dutch Aviation Accident Act (starting in 1993 and in force until December 31st 1998) mentioned no prohibition on the use of the report of the Board, but stated that statements of persons who were given to the Board and its representatives could not be used as evidence in any court case.

The present Dutch legislation, in the form of the Law on the Investigation Board of Safety (in Dutch “Rijkswet Onderzoeksraad voor Veiligheid”) holds the same prohibition and states further that the published report is publicly available.

Paragraph 4.4: investigations and reports 1958 – 2001

From their start the consecutive Boards have investigated accidents. From 1937 till 1992 the purpose of the investigation was to punish people involved in accidents although it was mentioned in legislation that the Aviation Accident Board could come with recommendations, based on the Aviation Disaster Act.

From 1992 on the purpose of the investigation, as defined in several Acts after the Aviation Disaster Act, was not to apportion blame but to find the cause or causes of accidents and incidents and to come with recommendation in order to prevent future accidents and incidents.

Over the period between 1958 and 2001 the published reports, as available for this thesis, were checked for punishment and recommendations. It is remarked that there is no certainty that the overview of this period is complete. For this period all in all 168 reports were read which led to the following results:

	Period between 1958 up to and including 1992:	Period between 1993 up to and including 2001:
Number of reports	100	68
Number of punishments	43	0
Number of recommendations	68 (at least) in 36 accidents	87 in 31 accidents

Table 1 number of reports, punishments and recommendations 1958 - 2001

In the accident reports for the period 1958-1992 only twice was there a statement of a police report that was made because of violations of regulations.

The reports showed that the Netherlands Aviation Accident Board acted as a court publishing reports with factual information but also with complete information about the pilots which were involved in an accident. The verdict of the board, be it a reprimand (most often given) or a suspension of a license, acted as a court of justice, based on the Aviation Disaster Act. Names and other personal details were given in the reports until the end of 1991.

The most severe punishment (a suspension of the license for a period of two years) was given once in 1970 when a pilot performed a roll at a speed too low to control the maneuver with two pilots on board; whoever of the two was the captain was not established during the investigation and the most experienced pilot was punished also because a blood-alcohol level of 1,05‰ was established.

It is remarked that one accident (October 4th 1992 of the El Al Boeing in Amsterdam) was investigated within the spirit of the (at that moment not yet in force) Aviation Accident Act. At the time the Aviation Disaster Act was still in force but the choice was made to use the new Act, soon to come into force, with the experience of the people who worked in the accident investigation system based on the old Act (Parlementaire Enquêtecommissie Vliegcrash Bijlmermeer, 2009). This investigation knew recommendations but no mentioning of blame or guilt, although it could have been possible under the regime of the Aviation Disaster Act.

Until 1995 persons that were involved in the accidents and incidents were identifiable based on the mentioning of either their full names, date and place of birth and residency or on the number and type of license that was issued. From 1995 on this information was no longer stated in the reports.

Paragraph 4.5: punishment or learning

An interesting case in relation to punishment and improvement with recommendations is a specific accident that happened in 1968. A Douglas DC 8 departed from Schiphol airport but took a wrong turn: instead of taking off from runway 19L it took off from runway 09, from a point where both runways intersected. During the take off and shortly after lift off from the runway, the aircraft damaged approach lights (of runway 27) and after an

investigation the Aviation Accident Board punished the captain by giving him a reprimand for taking off from the wrong runway (Raad voor de Luchtvaart (Netherlands Aviation Safety Board), 1969). No recommendations for improvement were made.

In 2006 an aircraft of a European airliner approached this same spot and was able to perform the same maneuver and taxi on the wrong runway, this time without taking off because the controller stopped the aircraft. Investigation learned that the infrastructure at the airport led to the possibility for pilots to follow the centre line on the taxi track, which split in two and these pilots followed the wrong line, leading to the wrong runway. After this incident, the lines have been changed.

The bitter parts of these two cases is that changes could have been made in 1969 after the accident with the DC 8 and that the crew of the 2006 incident had to pay a fine of € 3.400,-- before they could depart (Houtman & van Eck, 2007).

Paragraph 4.6: change in culture in society

Culture in society is changing all the time and most changes are difficult to see while they happen. In a culture of guilt people stress their own responsibility when dealing with damages and shame: people think in terms of guilt and individual moral responsibility. In a risk culture attention shifts from individual cases to a level where all adverse events within society can be seen as a whole and forming a part of society: the activity has more added value to society than the risks that these activities hold and victims of the activity are compensated for their damage. In a precautionary culture accidents are seen again within a context of moral condemnations: individual citizens do not have the knowledge that is necessary to understand the threats of technology and industry and those people who are, in society, responsible for the application of technology, are to be held accountable for the risks of those technology.

After the crash of the El Al Boeing in October 1992 in Amsterdam, flights over congested areas with aircraft in general and with aircraft with technical problems especially came in the public debate. They were presented as “external aviation safety” (the possible threat of aviation for the general public that lives below those aircraft, as opposed to the “internal aviation safety” which is the threat of aviation for the people working in or around aircraft or being transported in aircraft as passenger). This external aviation safety is one exponent of the precautionary culture. The new imperative of the precautionary culture is “first do no harm”.

Juridically the precautionary culture works from the basis of the principle of precaution: damage in a precautionary culture is a shame. The moral reproach for the damage hits the system controllers and damage is seen as a consequence of the way a system functions. Precautionary culture is also about disasters that might happen where damage is irreversible: fatal accidents of any kind. As long as the risks are not credibly set to 0 (zero), attention is given to what might go wrong. “Aircraft, and specifically those with technical defects, are not to fly over congested areas”, is a statement that can be heard in society. That the technical defect is minor and an aircraft is controllable, that the pilots and air traffic controllers are doing their utmost to not make a crash-landing, is not believed.

Pieterman concludes that uncertainty leads to threats being seen as an offence or as a crime and that the “utopian” need for safety is required, not requested. This then leads to bring all kinds of unwanted behaviour being brought in legislation and directed towards prosecution and punishment (Pieterman, 2008).

Concluding it can be stated that aviation accident investigation has gone through a cycle from punishment (at the start of the investigations) to prevention (when punishment did not seem to prevent accidents) and back to punishment (when the precautionary culture was coming above the horizon).

Chapter Five: Overview and Results of the Interviews and Questionnaires

The interviews were held with people in several groups:

- 1) interviews pilots and air traffic controllers, which have experienced an accident or (severe) incident after which at least two investigations started i.e. one from the Safety Board and another one from the police and/or prosecutor, with or without a prosecution (number of interviews: 15);
- 2) interviews pilots and air traffic controllers which have experienced one or more incidents without leading to these investigations, but who have a certain view on reporting incidents (number of interviews: 20);
- 3) questionnaires from student-pilots, working towards their theoretical exams for an ATPL, which included knowledge of Annex 13 of the Chicago Convention, but without or with very limited knowledge outside the theoretical world (number of questionnaires: 35);
- 4) interviews with a representative of the Dutch Aviation Police and the prosecutor who also coordinates the prosecution of aviation related cases (number of interviews: 2);
- 5) interviews with lawyers who have been involved in prosecution cases in aviation (number of interviews: 3);
- 6) interviews with judges who have experience with safety related cases (number of interviews: 2);
- 7) an interview with a representative of the Dutch Civil Aviation Authority (number of interviews: 1);
- 8) interviews with former members of the Dutch Aviation Safety Board (number of interviews: 3);
- 9) interviews with representatives of the media (number of interviews: 2);
- 10) interviews with brokers in aviation insurance (number of interviews: 3);
- 11) an interview with a member of Dutch Parliament (number of interviews: 1);
- 12) for reasons of comparison interviews were held with three persons from the medical world, a ships pilot, and with a representative of a safety advisory firm (number of interviews: 5).

All in all 57 interviews were performed and 35 questionnaires were returned for this thesis.

Paragraph 5.1: pilots and controllers with experience in accidents and/or incidents followed by a judicial investigation

Interviewees in this group came from air traffic control, hot-air ballooning, general aviation, commercial aviation and military aviation.

The division of the people was as follows:

- one air traffic controller;
- two hot air balloon pilots;
- from general aviation: eight pilots, six of them being a flight instructor and two in the possession of a Private Pilot License; two of the instructors also held managerial positions in flight schools;
- from commercial aviation: three pilots of which one also had held a managerial position and experience in two accidents;
- one military pilot.

A remark is made: several air traffic controllers and pilots, falling in this category, were approached for an interview as their experience was seen as valuable for this thesis investigation, but they declined the interview based on either their ongoing court cases or the fact that the case was closed for them. Persons in this group were all involved in severe accidents where the total time between accident and the end of the prosecution took several years.

Experience of those persons that were interviewed ranged from 250 flight hours to 27.000 flight hours and from being in aviation between 2 years and 40 years. The average age at the time of the incident or accident was 48 years and the average age at the time of the interview was 56 years.

These persons were involved in accidents and serious incidents; the outcome of these events were everything between an incident without any damage to a major crash with more than 50 casualties, or a slightly damaged aircraft up to a complete hull loss. The accidents and incidents in which the interviewees were involved varied from an emergency landing leading to damage to the aircraft through mid-air collision with injuries and a mid-air collision with several fatalities to a water-landing with a seaplane. Some persons had experienced more than one accident or incident. A list of accident and incidents is attached as Appendix 3.

Investigations were performed by the own organisation, the Accident Investigation Boards, and the Aviation Police, although not all three performed an investigation in every incident or accident.

In the following paragraphs information is given related to cases and cases are numbered. These numbers are constant throughout this chapter. They do not correspond with the events stated in the appendix in order to prevent identification of the interviewees.

Paragraph 5.1.1: Knowledge about legal position

Eleven of the 18 interviewees stated that they were not aware what their legal position was at the start of the investigation and one interviewee added that, although it was told to him by the police, he had no idea what the implications of this were. One interviewee stated that an investigation would start but was under the impression that the accident flight was to be his last flight ever. Five interviewees stated that they knew what their position was.

Reasons for not knowing what their legal position was, were:

- no previous experience;
- no knowledge about the subject, but maybe also not realized because of medication that was given in the hospital;
- not stated by the police (mentioned eight times);
- it was told in a late stage when I did not expected to be a suspect;
- the statement was given based on professionalism and honesty, where nothing has to be hidden.

One interviewee stated that, despite being told what his legal position was, the implications were not made clear to him. One other interviewee stated that his position was stated to him while he was standing in the meadow, next to the wreckage of his aircraft and another aircraft still burning in another meadow. When he read back his statement after some time, he saw that it was given under the stresses of the accident with wrong information, but the statement was never corrected.

Paragraph 5.1.2: Interviews after the accident or incident

In the majority of cases an interview was one held once; in one accident four interviews were held by the own organisation. Also in the majority of the cases the first interview was held by the police, followed by the Accident Board.

When asked whether the statements as they were given during the interviews in the end corresponded with the own recollection of events some remarkable answers were given: the report of the (foreign) Accident Board is completely different from what has happened; the police worked from an opinion and the questions were stated from that opinion; the first statements that were given had to be corrected and this was done when a lawyer accompanied me during the interview.

The majority of the interviewees recognized their own statements in a later stage of the investigation.

Paragraph 5.1.3: Prosecution and the outcome of prosecution

As for the prosecution information was given that in six instances a prosecution followed the accident or incident and in 12 instances this was not the case; in some of these cases the student-pilot or the pilot of an aircraft involved in a mid air collision was not prosecuted. Where people were prosecuted, this was based on one or more articles of either the Penal Code or the Aviation Act or both, i.e.:

- article 5.3 of the Aviation Act: it is forbidden to take part in aviation in such a way or to provide air traffic control service in such a way that persons or property are brought into danger or can be brought into danger;
- article 307 of the Penal Code: he who by negligence causes the death of somebody, is punished;
- article 308 of the Penal Code: he who by negligence inflicts grievous bodily harm to somebody, is punished;
- article 169 of the Penal Code: he who by negligence causes an aircraft to sink, run aground or crash, destruct, render unserviceable or damages, is punished (where the maximum punishment depends on the outcome);
- several articles from the Aviation Act e.g. not authorized to perform the flight; flight outside the flight envelope of the specific aircraft.

The relation between the knowledge about the legal position, the prosecution and formal grounds as well as whether a prosecution was expected is shown in the table below.

	Legal position was (not) known	Prosecution started	Formal grounds	Prosecution (not) expected	Final outcome
Case 1	Not known	yes	5.3 Aviation Act	Not expected	Convicted no punishment
Case 2	Not known	yes	308 Penal Code + Aviation Act	In late stage expected	Convicted with punishment
Case 3	Not known	No	-	Not expected	-
Case 4	Not known	No	-	Not expected	-
Case 5	Not known	No	Not known as the prosecution was related to the other party		-
Case 6	Not known	No	Student pilot did not expect a prosecution of himself		-
Case 7	Known	Yes	No information recollected	Yes	Prosecution non admissible
Case 8	Known	No	-	-	-
Case 9	Not known	No	-	Not expected	-
Case 10	Not known	No	-	Could have been possible	-
Case 11	Not known	No	-	Not expected	-
Case 12	Not known	No	Possibly 307 Penal Code + Aviation Act	Not expected	-
Case 13	Known	No	169 Penal Code	Not expected	-
Case 14	Known	No	-	Not expected	-
Case 15	Not known	No	-	Not expected	-
Case 16	known	Yes	169 Penal	Not expected	Acquittal

			Code		
Case 17	Not known	Yes	307 Penal Code	Not expected	Acquittal
Case 18	Known	No	307 Penal Code	Expected	-

Table 2: the relation between (not) known legal position and prosecution and outcome

In case 12 the interviewee stated that he was never informed whether a prosecution would follow or whether no charges would be raised against him of his organization. In case 13 the interviewee stated that he only received a verbal message from the police that no charges would be raised against him, as there was no gross negligence that could be proven. In case 17 the prosecution started (abroad) after four years.

The periods between the accident and the end of the prosecution or the closure of the case were:

- in case 1: 4 years
- in case 2: almost 3 years
- in case 5: 4 years
- in case 7: 5 years
- in case 12: almost 3 years
- in case 13: 1 year and 2 month before the police stated that no charges were raised
- in case 16: approximately 2 years
- in case 17: over 16 years;
- in case 18: 2½ years.

The use of specific expertise during the prosecution period is shown in the table below.

	By the prosecution	By the defence	Specific terrain of expertise
Case 1	yes	No	Human factors
Case 2	Yes	Yes	Balloon flights
Case 7	No	Yes	Mathematics
Case 12	No	Yes	Flight instruction during police investigation
Case 17	Yes	Yes	Test pilot, air traffic controller And meteorological expert

Table 3: the use of expertise

Lawyers were used in 9 out of 18 cases.

Paragraph 5.1.4: Consequences of the prosecution and the outcome

An important issue is related to the consequences of the prosecution and the outcome of the prosecution. The answers are split in the consequences for the interviewee and the consequences for his or her working environment.

	For the interviewee	For the working environment
Consequences	<ul style="list-style-type: none"> - a feeling of injustice coming from a strong feeling that the prosecutor had an own agenda - became more careful during piloting activities - a feeling of being put in the pillory - unsatisfactory for the next of kin - thinking ten times before answering to the judicial authorities - with care reporting incidents - the prosecutor seems to work for his own glory - the captain felt not guilty for what happened, no matter what the outcome of the trial would have been 	<ul style="list-style-type: none"> - nobody wanted to report incidents - people ventilate images and opinions without any grounds - unsatisfactory for the next of kin - judicial proceedings have a negative effect in aviation: everybody wants to stay alive and in business so safety is always the primary way of doing things - people have no idea how the judicial system works - colleagues are being more careful with the incidents they report - colleagues are of the opinion to better not report

Table 4: consequences of the outcome of the prosecution

Other details of the judicial proceedings were:

- when judicial authorities perform their investigations, they must be competent and know the system they are investigating;
- persons who make a mess out of their work should be put on trial before an independent court when nothing else works;
- I was convicted and punished but never meant to do harm to anyone;
- prosecution took a long time before it started and in the end the case was non admissible;
- there is a lack of knowledge in the judicial authorities in many cases;
- because of the present culture and the prosecution, one cannot teach students and colleagues to be open and honest to everybody about what has happened;
- judicial proceedings are counterproductive for aviation safety;
- the (female) judge was at last independent and objective;
- the time between the accident and the dismissal led to the consequence that I could not continue with my life. I needed a lot of energy in this period to be ready every day for the prosecution;
- I would have wanted a toxicological investigation, as was done on the casualties, just to be clear about the use of alcohol.

In two of the prosecuted cases one of the parties used a safety report; in one case this was a report of the own organization and in the other case the final report of the Accident Investigation Board. The first of these two cases resulted in a sentence without punishment where the court verdict stated the conditions on the working station as being of influence for the event to happen. In the second of these cases the interviewee stated that there was

insufficient information in the final report to come to a sentence. In one other case the interviewee had the idea that the prosecutor had used the report in the preparation of the court case.

Paragraph 5.1.5: Investigation of the Accident Investigation Board

Out of these 18 cases, there was a possibility to give comment on the draft report of the Accident Investigation Board in 9 cases and not in 8 cases. In one case the legal possibility to comment was not present as the Board then acted according to the disciplinary proceedings, described in chapter 4, and the captain's decisions and behaviour was assessed according to the disciplinary possibilities that were given to the Board.

Result of the comments on the draft reports were:

- four cases led to a corrected version as a final report, where in one case (case 16) the version 1.0 of the report was withdrawn and a version 2.0 was published after an extensive report of the own organization and an aircraft manufacturer;
- (case 2) in one case a remark was made about that accident in a report of another accident and there was no final report of this accident;
- (case 3) a final report did not hold the comments of the captain;
- (case 7) in one case this led to a corrected and final version that was based on a mathematical study of the trajectories of an aircraft;
- (case 12) in one case this led to a final report where comments were not seen in the final report and the situation was not described as it had happened, leading to an own report if the organization which was presented to the Board, but there was no new report of the accident;
- (case 15) in one case the organization received a draft version (and not the captain of the flight) where assumptions were made about details of the accident which were not verified.

Paragraph 5.1.6: Civil actions and litigation

In 10 out of the 18 cases there was a civil action against either the captain or the organization for which the captain worked. In 4 other cases there was no further action and in 4 cases it was unknown whether any action was started and/or what the outcome was. In most of these 10 cases the interviewees have no information available about the outcome of the cases.

In one case (case 2) the civil action, which started quite soon after the accident in 2003, was still ongoing. In another case (case 12) the organization came to a settlement with the next of kin. During trials of this last case the next of kin required the judge to come to an early obligation of the organization to change the flight procedures which, if granted, would have interfered with the applicable legislation.

Paragraph 5.1.7: Consequences for safety

In all 18 cases the interviewee talked with other people who were direct or indirect involved in the event. In one of these events information was given that was necessary to

make the picture of the event complete. In 17 of these 18 cases the information was not used during interviews after the event and in one case this was not known.

The interviewees were also asked whether information that was of importance for safety, was not given during the interviews after the event. In all cases no safety related information was withheld. In two case (case 12 and 16) the organization performed an own investigation to present new information about the sequence of events in the accident. This information ought to have been found by the Accident Investigation Board and taken into account for the final report, which was not done. The result was an incomplete final report of the Board, which was not overturned in one case and overturned and changed in a new report in another case.

The majority of the interviewees was of the opinion that there should be less investigations, but some expressed the fear that the information of the Accident Investigation Board might be used, direct or indirect, in other proceedings, where the events itself had a great impact on those involved. Some other interviewees expressed concern about investigations that were done by people who were not competent or qualified to investigate. This was applicable to all organizations that performed the investigations whether irrespective of whether this concerned the police and the prosecutor, the Accident Investigation Board or judges.

One interviewee stated that by definition the judicial investigation should be completed before the Accident Investigation Board publishes a final report. Police and prosecutors must do their investigations without any information from the Board and even the semblance of the use of that final report is avoided. The dilemma is that safety related information to improve the industry must be given or not and might reach judicial authorities, giving clues for the judicial investigation.

Another interviewee stated that aviation can become safer by pointing out responsibility that people have. Even when a legal framework is needed, regulations must be limited: more rules makes violation easier as people do not always know new regulations.

Two interviewees (cases 12 and 16) stated explicitly that prosecutorial proceedings are counterproductive for safety and that judicial investigations act as an obstruction for safety. Even when remotely proven that someone has done something wrong (within regulatory limits) there should be a realization for the judicial authorities that nobody in professional aviation acts wrong on purpose and mistakes are not to be punished. The parties involved in accidents and incidents, whether an airplane manufacturer, a flight school, an airline or and ATC organization, can improve the system faster than an Accident Investigation Board or a prosecutor.

The interviewee in case 12 stated that it is important not to speculate in the first few weeks after an accident, despite possible pressure from next of kin and media, as this might hamper a reconstruction of events. In case 17 the interviewee stated that people have the tendency to explain what had happened after media publications which were incorrect.

The interviewee in case 15 summed up his experience: “Tell the story one once, the quality of work of government agencies is below par and watch out for the interests of the parties during an investigation”.

One interviewee stated at the end of the interview: “You will hear more information about what really happened during an informal drink, in the cockpit or in the office than through the mandatory reporting systems”.

Paragraph 5.1.8: Settlement and completion of the event

In all cases but three the interviewees could give information about the settlement of the accidents in relation to the casualties and damage as handled by the insurance companies. Of interest in this investigation is the following information:

- (case 2) the insurance company stopped settling the claims from the moment they realized that there was a prosecution against the captain;
- (case 14) insurance companies are seen as another rule maker in Europe for the coming years
- (case 17): the insurance company used the information that was given by the airline and the final report of the Accident Investigation Board.

Paragraph 5.1.9: Reviewing the experience

The last questions of the interviews were related to a review of the experience of the interviewees.

The first question was whether the same event would now be handled different and there was an even split in the answers: 50 would handle the event different and 50% would handle the event the same way.

For those who would handle the event different, the following motivations were given:

- (case 1 and 15) no information would be given to the judicial authorities until a lawyer had been consulted;
- (case 3) consider carefully what is being said and what is written down in a statement, against who this statement is made and what the own legal position is;
- (case 4) have clarity about the authority you are talking to;
- (case 6) seek support from a lawyer and go through the sequence of events before having an interview;
- (case 7) first write things on a piece of paper for yourself, then think and talk;
- (case 10) be careful with the answers;
- (case 12) lock the doors, don't talk to the media, enjoin everybody to silence and have a media spokesperson ready to answer questions;
- (case 13) be careful with interviews when being emotional after the event.

In one case (case 2) the interviewee stated that he would handle the event the same way because the information would be given as it is: there is just one story.

Self incrimination is a danger that is present when people start to talk open to authorities without knowing their legal position, thereby giving information which might harm them in the course of legal proceedings. Interviewees were asked whether they had the idea that

they had incriminated themselves during the interviews with the police. 15 of the 18 interviewees stated that they could answer this question, where seven interviewees had the opinion that they had incriminated themselves and eight had the opinion they had not incriminated themselves. Important information is:

- do not give answers for other persons in the same event;
- do not answer leading questions;
- not knowing the legal position I might have given other answers that could have helped in a conviction. I have less trust in the judicial system.

Asked whether information was shared and incidents reported in the same way, less or more or whether no information was available, the interviewees gave the following answers:

- five stated that less information was shared and less incidents were reported;
- five stated that the same quantity of information was shared and the same amount of incidents were reported;
- eight stated that they had to information about the sharing of information or the reporting of incidents.

One interviewee stated that the way the police and prosecutors act in aviation was a reason to reduce the reports, as experienced by himself and seen and heard from colleagues, and that this is only done in those cases where information is registered elsewhere. In the past items were reported by colleagues of which others could learn, which will not be reported nowadays. Informal information sharing is still done, although in smaller circles and verbally. One of the interviewees organized evenings to exchange information in order to have others learn from each other and to improve knowledge.

Paragraph 5.1.10: Lessons for the future, lessons for others

From the experience of the interviewees the following lessons can be learned for the future and for others:

- (case 1) organisations should pay more attention to the possibilities to prevent errors;
- (case 1) organisations should support their personnel;
- (case 1 and 16) inform a lawyer or a union about what happened;
- (case 2) it would be helpful if there was an aid to give immediate support;
- (case 3 and 16) know your own legal position;
- (case 7) there are so much lessons learned, that one wonders why licence holders are not informed in some way by the authorities;
- (case 8 and 16) know the procedures;
- (case 12) the lack of competence of investigators led to less lessons learned and the Accident Investigation Board stopped with the investigation where the lessons learned became important;
- (case 13) be aware of what you say, especially when you are emotional
- (case 13) segregate your own experience from what you hear, see or learn in a later phase;
- (case 13) anything that is being said can be explained from different perspectives, the prosecutorial system being one of them;
- (case 14) instructors are important people to transfer information and to give people the right attitude towards safety and flying

- (case 14) the police and the prosecutor have to do their job to do towards society and the next of kin;
- (case 14) improvements can also be reached without safety investigations: the sector has its own responsibility;
- (case 15) write down as soon as possible what the own experience is and keep a sharp lookout for the way parties handle an event;
- (case 16) even in cases of gross negligence it is doubtful whether the prosecutor is functional in aviation;
- (case 16) do not sign written material that you do not understand;
- (case 17) licence holders have an obligation to themselves to be informed about accidents and incidents.

Paragraph 5.1.11: Disciplinary proceedings, are they of use?

Several sectors in society have their own disciplinary proceedings, where persons from this sector assess how people perform their jobs. This can be found in the medical world, for lawyers and journalists and the notary. Interviewees were asked about their opinion to (re)-introduce disciplinary proceedings in aviation, after it was abolished in 1992.

Are disciplinary proceedings acceptable in today's society	Yes	No	No opinion	Perhaps
	3	5	5	5

Table 5: acceptability of disciplinary proceedings

Problems and challenges with disciplinary proceedings and/or board	Positive points of disciplinary proceedings and/or board
<ul style="list-style-type: none"> * It will not be much different from prosecutions as it is still about punishing and not about learning * It needs an expert panel with expertise from different parts in aviation e.g. a pilot, an ATCO, a lawyer, an expert for human factors etcetera * It all depends on the acceptance of a disciplinary board by the aviations sector * It is often about the guilty party and in accidents and incidents one often sees between 3 and 5 different parties who have to add to the incident of accident * with casualties, there has to be an independent judge and a disciplinary judge represents the own group * no punishment: it's all about learning and improving * the disciplinary system has to be objective 	<ul style="list-style-type: none"> * It can reinforce the norms when members of such a board are competent * Board decisions from such a board will be assessed in a more serious way than a lay judge * honest mistakes can better be discriminated by a judge who is competent about the field of the event * more expertise can be expected from these proceedings and/or board * a good solution for the honest mistakes that stem from the system * there is more acceptance from verdicts that comes from peers * alternative ways to change attitude can then be additional training, back to school and testing, which will lead to people heading in the right direction

<p>and the qualifications of the board members is leading</p> <ul style="list-style-type: none"> * introduction must not lead to double punishment so no prosecutions * the (threat for a) punishment is leading for the given information * you don't need this system to find the bad apples in the system * this is no solution but another way to punish people 	
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Table 6: problems, challenges and positive points of disciplinary proceedings and/or boards

In cases of wilful misconduct the judicial system with punishment was still seen as a good solution: the penal system holds punishments that are not known in a disciplinary system.

Paragraph 5.1.12: Remarkable answers

Of interest for the complete view on this subject are the following answer which are remarkable for hypothesis 1 and 2:

- in one case the person who was formally responsible as instructor, had to compile himself the interview questions for the police after the incident as nothing of his world was familiar within the police, he thereafter was questioned as a witness and the answers were given in an open and honest way, without knowing that this person was incriminating himself. His expectation was that this interview would lead to improvements in aviation safety so he was not hesitant to given answer. The fact that he was questioned as the suspect in this case became obvious shortly before a summons was taken out against him;
- the way that the police and prosecution performed their work, was not always seen as competent. Several people stated that the questions that were raised during the questioning by the police and the way the prosecutor handled the accidents or incidents, gave signs of the absence of knowledge of the particular field of aviation, when sometimes even basic knowledge seemed absent;
- a flight instructor, involved in a midair crash, was confronted with lots of negative information about his person and his way of instructing people when he was questioned by the police force. Questions that were raised were very leading and biased, which gave him no good feeling about the rest of the proceedings.
- in another case the director of the flight school had to be aware of the fact that wrong information was used: very briefly information was given about asymmetric trust and this information was, in wrong wording, provided by the police to the Accident Investigation Board. This led to a report which was incorrect;
- this same director was interviewed trice, first as the director and the other two times as a suspect, while the police did not give him the recognizance that he did not have to answer the question. He had to urge them to give the caution, of which he later stated that he was glad he had some legal knowledge. During the third interview a lawyer was present and notes were taken. His last interview took place over six years after the accident and he still had no information from the prosecutor whether he would be prosecuted or not.

- Also in this case questions were raised by a policeman, who the director trusted as the policeman was a former student. In the end, the director had the feeling that he could no longer trust this policeman/former student.
- After a mid-air collision the pilot/instructor gave a brief statement to the police but was never asked questions again. This statement became part of the documents in the investigation of the accident board. His part of the investigation was built on this brief statement and was incorporated in the report of the board that was presented to him for comments.
- After a crash in a foreign country, the captain gave a statement to the local police, but quite quickly came to the conclusion that there would be no further judicial inquiry. The Dutch police interviewed the crew without the crew knowing what their position was and without any charges stated. The lawyer intervened when it became clear that there were charges and succeeded in the charges being dropped. After this the judicial authorities approached the judge-of-instruction and this judge started an investigation against “unknowns” (a possibility in the rules) which led to the fact that the crew was interviewed again, this time as a witness. They gave no statement about the accident itself, but informed the judge about what had happened and have stated that this way of working by the prosecutor had a negative influence in the reporting of safety events.
- Support from the own organisation is very important: in a suitable environment the possibility should be given to come to terms with what happened and to talk to people that can be trusted. Those who were involved in accidents or incidents had the desire to talk about what had happened. This support should not just be given for a short period of time, but becomes more important in those cases where prosecution of the persons involved in accidents or incidents takes quite some time (sometimes even over a decade).
- It is very important to write down your first impression of what happened or put them on a memo recorder. Use your time to put all known information on paper and have it read by a lawyer before it is released to the police.
- The full knowledge of what had happened “came upon me after I saw a radar tape with the information of the flight”.

Paragraph 5.1.13: A tail strike of an aircraft and its consequences

One accident, a tail strike, is worth mentioning because of the different approaches between the investigations of the Dutch Investigation Board for Safety and the Aviation Police. Information given here, is based on the presence of the author during the appeal trial and a presentation given during a Learning Laboratory at the Lund University in May 2009 [(Houtman, 2008) and (Houtman & van der Lely, 2009)].

In this case an aircraft started the take-off roll on a runway and there was a nose-wheel lift off at 41 kIAS, which was unusually low. The crew throttles back the power and nose-wheel contact was regained. The flight was aborted and the aircraft was taxied to the apron in order to start the trouble-shooting. There were two investigations performed, one by the Investigation Board of Safety and one by the Aviation Police.

The first of these investigations led to a report with 34 findings (Onderzoeksraad voor Veiligheid, 2006), amongst which were stated the findings that:

- seat assignment was not according to the passenger distribution table (nr. 7);
- the passenger distribution was not according the load and trim sheet and the passenger distribution table (nr. 8);
- the separation of the loading process from the load and trim sheet preparation process is a potential safety risk (nr. 9);
- no tool was available to accurately assess passenger seating distribution per cabin section (as presented on the computer generated load and trim sheet (nr. 13);
- crew members had to execute BOM and CSM procedures on passenger distribution verification using their own criteria (nr. 14);
- the management of the departments who received and handled the trip and flight reports with flight safety related information did not take appropriate corrective action to solve this structural problem (nr. 18);
- the trip- and flight reports which were used to report deviations from the required passenger distribution were not received by the Safety & Quality Assurance department and consequently not used for safety analysis (nr. 19);
- the occurrence reporting system of the airline did not provide the management with information to detect and correct deviations from the passenger loading procedures (nr. 20);
- the airline did not alert the handling agent about the uncommon practice and inherent risks to produce the load and trim sheet before the actual load figures are known (nr. 21);
- the handling agent did not provide training to its Passenger Services employees on the use of the passenger distribution table in the ASM (nr. 23);
- None of the handling agents ground staff employees had a complete overview of the loading process (24);
- the handling agent did not act in accordance with the ground handling agreement (nr. 25);
- the management of the airline did not adequately supervise the passenger loading related activities by the handling agent (nr. 26);
- the airline did not assure that the handling agent was staffed by trained personnel who had a thorough understanding of their tasks and responsibilities (nr. 27).

Related to the acts of the crew the following findings were stated:

- the captain did not take action after the report of unequal passenger distribution from the purser (nr. 11);
- the cockpit crew concerned was not aware of the significant effect of passenger distribution on the CG and, as a consequence, on the controllability of the aircraft (nr. 29).

The handling agent as well as the captain were prosecuted after a judicial investigation by the Aviation Police and a judge-of-instruction and acquitted of all charges during the trial (Rechtbank Haarlem, 2005), but the prosecutor appealed against this verdict. During the appeal in the High Court, the handling agent was dismissed of all charges because the appeal was made by the handling prosecutor on the wrong form. The captain was then the only one to be tried for this accident which led to a conviction of the captain based on an article with no norms and just a general statement about danger, which states that "it is forbidden to take part in aviation in such a way or to prove air traffic control service in such a way that persons or property are brought into danger or can be brought into

danger". This article is stated very wide and movement of an aircraft is not necessary to be prosecuted for this article: the broad interpretation makes it possible for an engine start to be prosecuted under this article as this can cause danger. This verdict was given in November 2008, almost 6 years after the accident. The public prosecutor has made an appeal and the case is transferred to the Supreme Court of the Netherlands. At the moment of closure of this thesis, the outcome of the appeal was not known.

It can be seen from the list of findings that most of the causes, leading to this particular accident, are systemic causes and that the last acts leading to the accident are being done by the flight crew. Despite these systemic facts the only person found guilty is the captain and the airline was never tried in court.

Paragraph 5.2: pilots and controllers without that experience

Interviewees in this group came from air traffic control, hot-air ballooning, general aviation and commercial aviation.

The division of the people was as follows:

- three persons were air traffic controller;
- two person were a hot-air balloon pilots;
- two persons came from the general aviation;
- eleven persons came from commercial aviation, flying for airliners;
- one person in this group was also a safety manager.

Licenses in this group varied: two persons held a tower and radar approach rating as an air traffic controller and one person had held such a rating; four persons held a CPL with IR, nine persons held an ATPL with various type ratings. Two persons were the holder of a CPL-FB, one person held an FAA CPL with CFI and CFII. One person once was in the possession of a military licence and one person had an expired PPL.

Ages varied between 28 and 65, with an average of 43,7 years of age. Number of years in aviation varied between 3 and 36 years with an average of 24.3 years.

Flying experience varied between 250 and 13.500 hours, with an average of 5.800 hours.

All persons were, during their time in aviation, involved in more than one incident which had to be reported, based on either legislation or company rules. These incidents took mainly place while working in a team, either in the cockpit or on an ATC position.

To give an impression about the incidents, examples are given by the interviewees and a list of examples can be found in appendix 2.

Paragraph 5.2.1: To report or not

Asked whether the incidents were reported, the interviewees stated that not all incidents were reported. In general aviation and hot air ballooning reporting of incidents is hardly done and when it is done, this is based on question by authorities. In the airline industry more incidents are reported but not all.

Reasons to report are:

- the incidents were so obvious that they could not be “not reported”;
- the incident it is registered in the aircraft systems and will be discovered;
- the fact that the aircraft is flown outside the normal envelope;
- the incident was seen as an unsafe act with a potential to learn;
- that the incident will be reported by the other party (i.e. ATC or the pilot);
- initial disagreement between pilots in the cockpit to report, leading to the conclusion that the incident was reported;
- police and ambulances arrived at the scene of the crash;
- satisfy the airline, although the operation will not be more safe; the Flight Safety department works with statistics and is not the “pain in the ass”;

- that the function inside the organisation leads to the fact that every incident must be reported, because the person is seen in a double role i.e. also as safety expert;
- safety is seen as one of the most important assets of the organization, so everybody know what to report and how.

Reasons to not report are:

- there is nothing that can be learned from the incidents
- the incidents was discussed within the aircraft with colleagues;
- the incident is not registered in the Flight Data Monitoring program;
- the incident was seen as too minor to report;
- initial disagreement between pilots in the cockpit to report, leading to the conclusion that the incident was not reported;
- fear for prosecution after having seen a judicial investigation or a prosecution from a colleague after an incident;
- it is a lot of paperwork and necessity is not obvious;
- when the personal assessment of the situation is that it was not unsafe, it will not be report
- embarrassment;
- no improvement is seen after having reported similar incidents in the past;
- an RTO at low speed is not seen as a safety issue, and therefore not reported.

When the question about reporting or not reporting was stated in general and not related to the interviewee, other reasons for not reporting were also given:

- negative outcome for the reputation, so “shove it under the carpet”;
- fear for personal damage or damage to the organisation;
- too much and too complex rules to know what is mandatory to report;
- not knowing where to report;
- fear for prosecution;
- macho culture in the organization and group thinking, where reporting is not seen as the correct way to do the job (“If you are one of us, you don’t report”);
- fear for reprimands;
- there is no use in reporting as nothing changes;
- legal aspects are a reason not to report, like the chance of being prosecuted;
- reporting leads to a certain field of tension: commercial operations on one side and an aircraft on the ground on the other side;
- pilots have the feeling they are between safety and commercial operations;
- people do not know what will happen once an incident is reported;
- a deviation from the standard can be so slow, that it is hardly seen by the persons inside an organisation;
- the “paperwork” related to reporting an incident is seen as a burden;
- they did not train me to do all the paperwork, I am just a pilot;
- people can become less or not motivated because of the way that an organization handles safety.

It was remarkable that “fear for prosecution” was often stated as the third or fourth item, after personal reason e.g. shame that it happened to me.

Paragraph 5.2.2: Incidents of colleagues and investigations

Incidents of other people were sometimes known. It was not always known whether these incidents were reported or not. A FDM program is a reason to report.

Where the interviewees worked more closely together, like in air traffic control, more information was known about incidents of colleagues. Also where the interviewees had additional tasks in the past e.g. being a member of the ATIC or doing incident or accident investigations, more is known of incidents and accidents that happened to colleagues.

Where it is known that an investigation has been performed after the incident and the aftermath took a long time, it can become a reason for persons to think twice before reporting an incident, even when safety is concerned. A specific case that was mentioned, is the above mentioned tail strike, that had impact on the reporting of several interviewees: they had a tendency to not report.

A specific place can be reserved for the world of balloon flying: two interviewees stated that the majority of the incidents were not reported. On a yearly basis approximately 9.000 balloon flights are performed in the Netherlands and approximately 2.200 flights are registered by an organisation for pilots. In 2 out of these 2.200 flights there was an accident and in 10 out of these there was an incident. Extrapolated to the 9.000 flights, these numbers can be given as 8 accidents and 40 incidents. The interviewees stated that they knew that accidents and incidents were only reported when the media mentioned them. Weather conditions were most cited in these cases. The lack of visible enforcement was mentioned as one the contributory causes.

Paragraph 5.2.3: Who performed the investigations

Investigations that were mentioned, were performed by the own organisation or the Accident Board for Safety or the police. For ATC and for the balloon world, it was stated that the Board and the police had insufficient knowledge to perform investigations. For the own organisations it was stated that there was insufficient capacity to perform the necessary investigations in relation to the filed incident reports.

Paragraph 5.2.4: Consequences

Related to the consequences of their experience it was stated by the interviewees that:

- the Delta case was, after all these years, still a landmark case to illustrate the reduction of reported incidents in an organisation, not just nationally but also internationally;
- in at least 99,8 % of the incidents judicial proceedings are not seen as the correct method to force people in the “correct behaviour”;
- even in cases of “optimizing violations” people try to do the best they can to do their work and judicial proceedings are not seen as the best intervention;
- reporting and accountability are a proper way to improve safety;
- people are not taught to report incidents at the start of their pilot training, contrary to the United States where reporting is normally done and leads to a higher standard;
- when reporting is experienced as useless because of a lack of follow-up, in-cockpit talks about incidents are of use to improve one’s own performance;

- my own company has a good safety standards and accepts reporting, but the fear comes from the outside world: the threat of a judicial investigation holds a risk of not-reporting leading to a reduced safety level;
- think (at least for a night) before talking to the judicial authorities;
- reporting and learning from incidents is more important than the threat of a judicial investigation;
- there is a need for a certain flexibility in the day-to-day operations and when this leads to an error, it should not lead to a judicial investigation;
- judicial interference has led to less reporting of incidents, especially those incidents that are related to the own errors of those who had to report.

Paragraph 5.2.5: Opportunities to learn

Looking for other opportunities to learn when incidents are not reported the interviewees stated that it would in general be difficult to learn and improve. Safety improvement and learning then becomes a part of the “hangar talks”: informal moments when experience is exchanged. Most interviewees stated that this would more often than not lead to less information about system problems. Problems are touched but not in depth investigated.

Asked whether reporting would lead to safety improvement all interviewees stated that this was the best possibility for safety to be improved, but:

- culture is an important part of reporting: people don’t like to talk about their own mistakes;
- reporting needs a follow-up and a closing of the loop;
- the present culture of safety, which holds decades of open talks about errors and mistakes, is fragile.

Paragraph 5.2.6 Disciplinary proceedings

Disciplinary proceedings were not always at first glance seen as a system improvement. People should not be punished for errors during their work. Because aviation encompasses a lot of different activities, from glider flying and balloon flights to commercial operations which span almost half the world in one flight, it was seen as difficult to compile a disciplinary board that was competent in all types of aviation. Introducing disciplinary proceedings could have an advantage when all system items were taken into consideration to establish if and up to what level were accountable for incidents. Disciplinary proceedings could, by the general public, also be seen as a “closed shop” where people in aviation help each other with covering errors and mistakes. Disciplinary proceedings were not seen as a part of system improvement and it will most probably fail in complex situations. The advantage of disciplinary proceedings might be that the standard of working can be kept high, where the outcome of these proceedings will be more respected and accepted as the outcome comes from “colleagues” in the system.

The Delta case was referred as a case where people were punished while the errors were related to the system they worked in: the verdict of the judge was seen as incorrect, but it was questionable whether the judge was able to judge the situation as he was not or insufficient knowledgeable about the workings of the ATC system.

Paragraph 5.2.7: Improvements

Improvements as seen by this group of interviewees were:

- the judicial system should realize that system improvement are possible and can be done without punishing people;
- start with the initial training where the necessity of incident reporting can be stressed, and repeat this necessity in later training programs;
- train legal people in human factors and human error;
- clear and brief rules on what to report;
- the threat of punishment leads to an unsafe feeling while working;
- simplify complex rules;
- the consequences of “honest mistakes” have to be “honest” as well;
- and gross negligence should be punished;
- come to an agreement with the prosecutor on how to improve without punishing;
- judges and prosecutors should be competent and have knowledge about the aviation system;
- there should be an open culture to learn, while accidents and serious incident must be investigated without having direct consequences for those involved in the accident and incident: learning and improving should be leading, and punishing people should only be done with care;
- immunity against prosecution is not a solution: it can lead to recklessness and carelessness;
- you are trained to do your work with the highest standard of responsibility and you should act in this way. Prosecutors must be aware of that.
- Invest in people and invest in the will to improve, as this might lead to less interference of the judicial system.

Paragraph 5.3: questionnaires from students

A questionnaire was compiled and given to ab initio student pilots, who had completed or were about to complete the theoretical part of their licenses. They at least had the theoretical knowledge of the contents of ICAO Annex 13. All in all 35 questionnaires were returned. Experience in this group was limited and not more than 20 flying hours. No additional information was given to the interviewees, except that it was related to this thesis.

The division male-female and the ages were:

- 30 males
- 5 females

Ages between 18 years and 33 (average age = 22,4 years)

Mandatory reporting of accidents and (serious) incidents was seen as a necessity by all interviewees. Statements that were made are:

- reporting improves safety
- reporting can lead to prevention in the future
- safety is the highest priority
- learn from the experience of others
- you cannot learn from cases that are swept under the carpet

where one interviewee in this group also reported that the reporting of accidents and incidents that were caused by oneself, holds the danger of being used against oneself.

33 out of these 35 stated that an investigation by an Accident Board was necessary after an accident of serious incident (94%), while 31 stated that an investigation of the own organisation was necessary as well (89%). Only 17 of them stated that a police investigation was necessary after an accident or serious incident (49%).

As far as the purpose of the investigation is concerned the following results were found:

	Learning for those involved in an accident or incident	Learning for other people	Punishment of this involved in an accident or incident	Punishment to deter others
Accident Board	31 (89%)	34 (97%)	2 (6%)	4 (11%)
Own organisation	32 (91%)	29 (83%)	7 (20%)	3 (9%)
Police and prosecutor	8 (23%)	11 (31%)	11 (31%)	15 (43%)

Table 7: purposes of investigations

One question in the questionnaire was related to the combined investigation of safety and judicial investigations. Out of the 35 questionnaires, only 7 interviewees stated that this combination could be done and motivations varied between “learn from punishment” through “it improves investigations” to “nobody is perfect”. The 28 other interviewees (80%) gave “no” as answer and motivations in general were that safety investigations

needed a safe environment to come to learning and improving. In two questionnaires it was stated that prosecution and punishment are to be related to intent.

Risks, attached to judicial investigations and prosecutions, were mentioned:

- 15 times: a less open culture, no reporting, fear for punishment and cover-up
- 8 times: that there will always be someone who is stated as the guilty party and fear for punishment
- 3 times: interpretation of the information in a wrong way because of lack of knowledge
- once: loss of licence
- once: unlimited claims
- once: loss of material
- once: prosecution does not lead to improvement of safety
- once: less flexibility for professionals as they will no longer act according to the best insights

In eight questionnaires the interviewees did not give an answer (5 times), stated there was no risk (twice) or had no idea (once).

Question six was asked about the use of evidence in prosecutions:

	To be used	Not to be used
Information from flight data recorder	31 (89%)	3 (9%)
Information from cockpit voice recorder	31 (89%)	3 (9%)
Final report of accident board	27 (77%)	7 (20%)
Other information (specify) <i>(remark: items were mentioned more than once)</i>	<ul style="list-style-type: none"> - whatever is relevant - training information - witness statements 	2

Any other relevant information:

- all material and evidence that can lead to clarity should mandatory be used;
- information might only be used in cases like hijacking;
- ATC communication and statements from eye witnesses;
- prosecution only when there is negligent behaviour, and not when people have acted according to the rules;
- use of FDR and CVR holds the risk that information is wrongly interpreted because of lack of knowledge;
- one interviewee was in serious doubt about the use of this information: it was stated that it could be wrongly interpreted because of lack of knowledge, but on the other hand it should be used for liability;
- there have to be serious indications to use this information and the information must not be used for other purposes like assessments of pilot capabilities;
- by using this material a better (more honest) opinion can be given about the complete situation, despite my personal opinion that safety investigations are more important;
- there should be two investigation board who act independent or each other and come to a report;
- the pilot has to agree on the use of the CVR;
- the parts of the final report of the accident board, that are to be used, must be indicated by that board.

Table 8: evidence to be used in prosecutions

Question seven was related to the cases that a judicial investigation and/or a prosecution was necessary or was wanted.

	Judicial investigation and/or prosecution necessary	Judicial investigation and/or prosecution wanted
Use of alcohol/drugs while flying	27 (77%)	8 (23%)
Intentional violations	26 (74%)	9 (26%)
Inattention	13 (37%)	10 (29%)
Fatal accident	14 (40%)	14 (40%)
Accident with injuries	11 (31%)	12 (34%)
Accident with material damage	10 (29%)	12 (34%)
Accidents always	11 (31%)	8 (23%)
Only serious breaches of rules	19 (54%)	8 (23%)
Any breach of rules	9 (26%)	9 (26%)
Other (specify)	0	0
Relevant information from this question: - some interviewees did not specify the mentioned items for necessity of wanted and left the space open. There is no indication as to the reasons for this; - one interviewee added that judicial investigation and/or prosecution is only wanted when the Accident Board was reasons to do this; - several interviewees added that in some cases it depended on the severity and whether these items were related to intent or not.		

Table 9: necessity of judicial investigations in certain events

Disciplinary proceedings in the Netherlands against pilots were possible, based on the Aviation Disaster Act until 1993. The Dutch Aviation Safety Board had the legal authority to come to disciplinary punishment, like the withdrawal of a licence or a reprimand (Dutch Government, 1937). Other sectors in society like the medical world, still hold this authority for certain boards. At present there is no disciplinary punishment possible by the appropriate Dutch Board. The questions raised in the questionnaire were related to the information that judgements were given by persons from aviation:

	Answers and motivation:
Is disciplinary jurisdiction useful in aviation?	Yes in 30 questionnaires (86%) No in 5 questionnaires (14%) Added information: - they know how pilots might react; - the judges are knowledgeable (mentioned quite often) - only in the less severe cases - might be quicker than a prosecution
Might disciplinary jurisdiction lead to punishment?	Yes in 21 questionnaires (60%) No in 10 questionnaires (29%)

	<p>Maybe or no answer in 4 questionnaires (11%)</p> <p>Added information:</p> <ul style="list-style-type: none"> - only within the companies - appeal must be possible - judges have to be independent - punishment only when rules have been broken - in more severe cases still the prosecutor - punishment only in severe cases (mentioned several times) - the law should be the guidance in all cases
Would people experience disciplinary jurisdiction different from prosecution and (criminal) punishment?	<p>Yes in 27 questionnaires (77%)</p> <p>No in 5 questionnaires (14%)</p> <p>No opinion or do not know in 3 questionnaires (9%)</p> <p>Added information:</p> <ul style="list-style-type: none"> - the judge is knowledgeable - has more knowledge than an ordinary judge - punishment can or might be felt as more just - it can even be felt more harsh when it comes from the own sector - it might be felt as treason
<p>Other reactions and relevant information:</p> <ul style="list-style-type: none"> - there might be prejudice, therefore no punishment and the way people experience disciplinary jurisdiction is not applicable (mentioned twice); - disciplinary punishment might create a culture of silence; - who will have this power? - disciplinary punishment can not be a substitute for the normal judicial process; - one interviewee added that, although disciplinary jurisdiction was useful in aviation, it should not lead to punishment 	

Table 10: disciplinary judgements and punishments

The last question was related to the way the interviewees should like to learn from accidents and incidents, where more than one answer was possible.

Sources:	Yes	No
Short reports	29 (83%)	1 (3%)
Final reports of Accident Investigation Board	28 (80%)	5 (14%)
Final reports of own organization	29 (83%)	3 (9%)
Internal publications of own organization	26 (74%)	6 (18%)
Judicial interventions and publication	14 (40%)	15 (43%)
Disciplinary interventions and publication	19 (54%)	8 (23%)
Others (specify)		1 (not specified)

Table 11: sources for learning from accidents and incidents

Paragraph 5.4: Aviation Police and public prosecutor

The Netherlands has, for decennia already, a special branch in the police force. It is the Aviation Police that enforces the aviation legislation in the Netherlands by visiting aerodromes, checking pilots and investigating accident in aviation. The accident investigations are oftentimes in combination with the Dutch Investigation Board for Safety: data that have been gathered by the police is given to the investigators of the Board, but not the other way around. This is based on an agreement between the two organisations.

Since 1982 there is a prosecutor who is partially responsible for the prosecution policy of aviation related cases. He is not necessarily the prosecutor who will bring the case to court, but usually advises the prosecutor who brings a specific case to a specific court.

Paragraph 5.4.1: Aviation Police

The representative of the Aviation Police indicated to have been involved in numerous accidents ranging from the general aviation to the commercial aviation and he stated that on a yearly basis between 100 and 150 incidents (emergency and precautionary landings) and accidents (as a damaged aircraft or casualties) are investigated. The majority of the work comes from the general aviation. The subject of the investigation can be the pilot, an air traffic controller, a maintenance person or organisation or the owner of an organisation in aviation. The objective of the investigation is to establish whether a pilot, an owner of an organisation or a maintenance organisation has acted according to the regulations.

Persons who work in the Aviation Police have their knowledge of the national legislation, which is seen as being derived from international rules and regulations. Through education and training knowledge is gained.

Apart from their own investigations, also investigations started by the Accident Investigation Board (and the police shares information with the Board) and the organisation that is involved. Insurance companies were seen more for an own investigation.

At the start of an investigation the subject of the investigation is told what his or her position is; at present people are first interviewed as a witness and once it becomes apparent that they are the suspect, a recognizance is given that he or she no longer is obliged to give an answer. A witness is not obliged to give an answer according to the Procedural Code.

Where an investigation is started from the perspective of inspection (i.e. there is no suspect yet) any witness has to cooperate with the inspection: identity of a person must become clear and documents have to be shown, but a statement is not necessary. Once this person might become a suspect, the recognizance must be given and the inspection continues on the basis of an investigation, where proof must be found whether the law was abided to and whether there was negligent behaviour.

It is also made clear why other investigations start (i.e. like the Accident Investigation Board) and what the purpose of these other investigations are.

It is the intention to interview the suspect in a case once, but sometimes it can be done twice or even a third time. It is usually the police that is first at the scene of an accident and therefore also the first one to speak to those involved in an accident. It is very exceptional that a lawyer is first consulted by a pilot before the pilot talks to the police. In the commercial aviation persons are less inclined to talk to the police, where people in general aviation talk a lot and give a lot of information; sometimes more information is given than might be seen as sensible in relation to being the suspect. Support by a lawyer is mainly seen when another interview takes place.

When people do not give information, the stated reasons for this are 1) shame about what has happened; 2) exonerate oneself; 3) protect oneself against the airline; 4) protection of the airline; 5) having had enough of a police investigation.

Once there is a reasonable doubt that the law has not been adhered to the investigation will be broadened. This “reasonable doubt” is then combined with wilful conduct and gross negligence. It is the prosecutor who usually decides whether a prosecution will follow after a police investigation.

In most of the investigated cases there is no prosecution: it is estimated that on a yearly basis 3 to 5 (out of the 100 to 150) cases are prosecuted. In an early phase after the police learned about an accident or incident the prosecutor decides whether the investigation must continue or not; this is a new policy recently introduced as in the past it could take sometimes more than 12 months before this decision was made after an extensive investigation. According to the Procedural Code, the case must be “legally and conclusively” brought to the judge before there can be a conviction. Where necessary experts are requested to give their opinion; expertise can be from a legal, flight technical or forensic point of view.

In other cases, where casualties were the result of an accident, an official report is made and sent to the prosecutor, although this is mainly done for possible litigation cases. It is stated that insurance companies want to have copies of these reports for liability claims.

Prosecution is done based on a directive (College van procureurs-generaal, 2009) which also holds the proposals for fines or a directive for direct prosecution. The final result can either be a settlement, proposed by the prosecutor, or (when cases are brought to court) an acquittal or a sentence.

The final report of the Accident Investigation Board is not used for the prosecution case. Although the information stream is from the police to the board, there is no stream back and the final report is only seen when it is made public. There can be cooperation for parts of an investigation (technical or destructive investigations) but not for the analysis or conclusions.

It was remarked that the next of kin often find it hard to accept when people ignore their responsibility in an accident.

From a point of view of the police openness and honesty from those involved in an accident and incident were seen as important, and not talking might lead to a position where people might harm themselves. Openness leads to less investigation and a quicker solution about the follow-up of an initial investigation. Repentance over what has happened is part of the assessment for a verdict.

Also from this point of view the judicial investigations were seen as contributory to safety because the information given to the police during an investigation also is transferred to the Aviation Authority and the Accident Investigation Board which in turn leads to a safer system, while on the other hand persons and organisations in aviation have stated that judicial investigation as performed by the Aviation Police inhibit safety. There is however no knowledge whether more or less information is shared (formally or informally) in organisations.

Future improvements are openness towards each other: by hanging on to the ideas that there is no place for the judicial authorities, especially as done by airlines, and not sharing information a container is created which limits free thinking and finding solutions for the (perceived) problems between organisations.

Disciplinary proceedings were not seen as a solution and the expectation was that there will not be less prosecutions when disciplinary proceedings have been introduced in aviation. Disciplinary proceedings are also seen as an old boys network.

Ideally an investigation should be based on openness and clarity: sharing factual information, showing what is being done or has been done, and transparency by all parties. Historical feelings, which in his opinion are partially based on falsities, should be left behind. Dutch aviation is not ready to abolish prosecution for aviation cases.

Paragraph 5.4.2: the public prosecutor

In the Netherlands just one prosecutor is attached to aviation cases and this person decides and advises in cases how they should be dealt with. Since the last appointment, approximately one year before this interview, a changed policy has been introduced:

- after an accident or incident has become known to the police, the prosecutor is informed as soon as possible when the first factual information is known;
- it is then decided whether a further investigation is needed and if the conclusion is reached that there is no judicial gain, the investigation is stopped;
- where the case is not clear, there is no other way than to continue the investigation and do a new assessment later in time;
- criteria that are used to start or continue an investigation are:
 - casualties as the first and foremost criterion, and there is no difference with other cases in society
 - negligence or gross negligence, although it is clear that there is a thin line between these two and each event shall have to be assessed according to the own facts;
 - substantial carelessness or recklessness, which depends on the behaviour of a person, is different for each individual event and there is no policy for this item;

- thereafter comes the criterion whether there should be a prosecution or not and this depends on the content of the investigation and the official police report;
- the use of article 5.3 of the Aviation Act is often attached to carelessness or recklessness and it is known that this is more or less a hanger for the prosecution, and used in several cases like the (earlier in this thesis mentioned) Delta case and the tail strike;
- no use is made of the reports that have been made according to the rules to the appropriate authorities, although it is always possible that knowledge about this same incident comes from other sources;
- judicial investigations are sometimes (and at present even more than some years ago) started after a complaint has been filed: in those cases an investigation has to be started. One example, that was mentioned, is the Delta case that started because of a complaint of the captain of the Delta Airlines aircraft. Not investigating is not a possibility as the Court of Appeal might order the prosecutor to perform an investigation when he decides not to investigate the case.
- the procedure to go to a Court of Appeal as can be done by citizens when no investigation or prosecution is done, exists already very long in the Prosecutorial Legislation³ and the discretionary space of the prosecutor to not investigate or not prosecute is tested by the Court of Appeal.⁴
- where there is doubt about an event whether it should be prosecuted or not, use is made of the discretionary space of the prosecutor and this might lead to a court case where the judge has to decide about the case.
- items in the discretionary space which have to be taken into account are e.g. hazard, societal interest, blameworthy behaviour and equality before the law;
- use is made of national but also international legislation from ICAO and EU to prepare cases for prosecution.

Judicial investigations can be performed where the captain, the flight instructor, an air traffic controller or a ground engineer is the suspect of the investigation; a company can also be prosecuted⁵. Most cases that the prosecutor is involved in, are related to the general aviation and in that area of aviation people hardly make use of a lawyer or judicial support. The minority of cases are related to commercial aviation and judicial support is quickly seen. Enforcement capacity has to be used with sound knowledge.

The position of the person(s) involved in an accident or incident has to become clear very quickly, as there is a legal difference between a suspect and a witness. Where a person is interviewed as a witness but appears to be a suspect, this has to be documented with care in order for the judge to come to a correct decision about the way the evidence is collected. The other side of this same issue is that most people do not know what their legal position is and this requires more care from the police as well as the Accident Investigation Board.

³ The contents of this article (article 12 of the Prosecutorial Code) states that when an offence or crime is not prosecuted, anyone with an interest in the offence or crime can make an appeal in writing to the Court of Justice.

⁴ It is remarked that in other countries in Europe there is no discretionary space for the prosecutor and he has to prosecute every case that becomes known. The judge in the end decides then about the case.

⁵ This is done with article 51 of the Penal Code as a basis, which states that offences and crimes can be committed by natural persons and by a corporate body.

Investigations have to be done as quickly as possible without losing quality of the investigation; goal is to inform the suspected parties as soon as is possible about the continuation of an investigation.

As for the use of experts he was of the opinion that in court cases this was not very useful as there always might be an expert with an opposite opinion. It should be prevented where possible.

Use of final reports of the Accident Investigation Board is legally not possible and should not be done, as this was not the intention of the legislator. It can, on the other hand, be used as information to steer an investigation. Opinions in his world differ: in some case the prosecutor has tried to inform courts about the existence of the final report, in other cases the lawyers have tried to do so, and both have contested each other about this.

Concept reports of the Board are not seen.

Cooperation with the Board is satisfactory: there is a protocol for cooperation and it was formalised during a recent big accident. There has to be less “old boys network” and a more formal way of working between the two investigating authorities: where the police or the prosecutor has to deliver information to the Board, this has to be done within the terms of the applicable laws, including laws that apply to the way the police has to work. In the blind giving all information to the Board should not be done.

Information from an FDR could be used for a prosecution when the Accident Investigation Board did not start an investigation, as the recorder is then not legally protected. Other persons who might have data that are of use for a judicial investigation, can be forced by law⁶ to hand-over this data.

Insurance companies are not often seen, but when commercial aviation is involved the insurance companies use the bigger companies. When information is requested by an insurance company, information is only given when there is an obvious interest for this company to receive the information and it is within the published policy. Such a situation might be when an aircraft has crashed into a house and the house was (partially) burned down.

Judicial investigations and prosecution are to be seen as a part of society. Society does no longer accept that there is no investigation after accidents and disasters. Specifically mentioned as examples of these were mentioned: an exploding fireworks factory and a fire in a discotheque, both leading to headlines in the media. Society expects from the prosecutors that there is a proper investigation performed and assessments about prosecutions have a firm ground;

⁶ Basis of this is article 126nd of the Prosecutorial Code which states that a prosecutor, in the interest of the investigation and in case of a crime when preventive custody is permitted, can require from anyone who is suspected to have access to certain data, to hand-over this data. This requisitioning is not done to the suspect in the crime.

Part of this discussion to investigate and to prosecute is the “Garantenstellung”⁷ that requires a duty of care from people when doing their work in a certain profession. Where there people work more professional, society requires more and when things work out in the direction of an accident or a severe incident, a front line operator can meet the judicial investigators.

Disciplinary proceedings might make a difference for the person who is the subject of this proceedings, but from the point of the prosecutor there is no specific choice to keep it deleted from the legislation or to re-incorporate it.

Asked for the number of cases in which a judicial investigation by the police had led to further actions from the side of the prosecutor, the following information was given.

Year	Number of cases for prosecutor	Paid after proposal by prosecutor	Handled in court
2005	21	18	3
2006	15	15	0
2007	0	0	0
2008	7	7	0
Average	10,75 cases/year	10 cases/year	0,75 cases/year

Table 12: number of cases forwarded by the police to the prosecutor and the way cases were then handled

Asked about the consequences of judicial investigations and prosecutions in relation to safety reporting, he stated that there the aviations sector never presented data which proved this. The function of judicial proceedings and punishment in society is to prevent things happening again. As for aviation the function is also to assess whether one can speak of blameworthy behaviour and whether this behaviour should be prosecuted. In point of fact: to enforce the norms in society.

A point of concern from the prosecutorial point of view is that it seems not done to talk about the balance between economics and safety and that this hardly seem to get any attention.

To ask for trust also means to give trust: this is requested from the aviation sector as it looks like they try to stop prosecution with every possible means. Trust and cooperation leads to more acceptance and leads to clearness about events.

⁷ “Garantenstellung” is a legal term to indicate that a greater responsibility rests on a person with special qualities. It sets a level of blame that can be assessed and is of importance in the Penal Code (criminal offences and the exclusion of guilt) and in civil court (wrongful act or tort). The special qualities are related to specific knowledge or skills that a person has. (Wikipedia, 2009)

Paragraph 5.5: the lawyers

Next to the police and the prosecutor one can find the lawyers in court, helping in defending the suspect.

The three lawyers had experience in aviation accidents and incidents that were prosecuted or have led to a civil case.

Lawyers see aviation as an activity with very detailed regulations concerning the behaviour of people in relation to safety. Prosecution of accidents and incidents should only be done in cases of wilful misconduct or gross negligence, where it is remarked that wilful misconduct is not very imaginable: no pilot will wilfully operate an aircraft in a way as to endanger himself, the crew members, the passengers, the airplane and the environment. Despite the fact that the starting point for prosecution, as laid down in an instruction of the Board of Procurator-Generals, is to be restrictive when prosecuting, the prosecutor that handles the cases uses an own qualification of the facts and whether these facts are related to wilful misconduct or gross negligence. A decision to prosecute should therefore be tested by a superior colleague. In the daily practice of one lawyer he saw more cases where the more severe parts of the Penal Code were used in the prosecution, among them being articles 168 and 169 of the Dutch Penal Code.

As mistakes and errors are being made within a system that might lead to safety risks, prosecution of natural persons should in principle not be done but should be directed towards those people responsible for the safety management system of organisations.

Stated as a point of utmost important is the fact that persons who are being questioned by the police within a judicial inquiry, should be advised and have the assistance of a lawyer, irrespective of whether these persons were questioned as a witness or as a suspect, whether they act as natural person or on behalf of an organization. The official report of the questioning can be an important part of the evidence.

Not always is the involved person knowledgeable about his or her position in a judicial investigation. Persons unfamiliar with the proceedings of the Penal Code might answer any question without seeing the implications of the answer and the possibility of self-incrimination. Although people are usually honest towards the authorities when questions are raised, they also “talk more than necessary”. When no lawyer has been consulted, neither the witness nor the suspect in a case has the obligation to answer questions.

Advise or assistance of a lawyer should also be sought by front line operators in cases where a safety investigation by an Accident Investigation Board is being performed simultaneous with a judicial investigation: although the statement given to the Board cannot be given to the police and the prosecutor, the final report of the Board refers to statement of those persons that were interviewed⁸. One lawyer was of the opinion that the

⁸ Other reasons for seeking legal advice from a lawyer, as stated, are the opportunities that lawyers can give for emotional relieve, explain the complete event, and support in a judicial and psychological way. One lawyer gave anonymous examples of cases that took four years (criminal court case), almost three years (civil

combination of investigations, where the police hands the statements of involved persons and witnesses to the Board, should not be done. Reason for this is the fact that the search for the cause of an accident leads to a person who can be blamed for the accident and cooperation can be self incriminating; the error of a human is the raw material for a prosecution.

As for the draft report of the Accident Investigation Board one lawyer was the opinion that it is of utmost importance to use the possibility to give comments on these drafts in consultation with a lawyer: statements are used by two organisations for different purposes but this use is mixed or gives the impression to be mixed and this in turn can cause the involved front line operators to be outlawed. An accident or incident is “weighed” in the final report and the outcome can and sometimes will be used in other proceedings. There is always a chance that an individual will be interviewed and assessed. In general comments on draft reports have an influence on the final report.

The prosecutor should seek advice of experts in judicial investigations and not proceed based on the reports of the police. The knowledge of prosecutors was on average not very impressive. Advice of experts is sometimes asked by lawyers and then used in a criminal court case.

Although criminal proceedings do have a function in society, aviation related events should not be treated in the same way as road transport events. Oftentimes cases in road transport are not prosecuted because the consequences of the events were severe for those involved, where a similar case in aviation is prosecuted. There is no prosecution policy for these cases for aviation.

Apart from that, the final report of an Accident Investigation Board should not be used as evidence against the suspect and legislation should be improved on this point as the use of the report is not always clear for the magistrates.

In civil proceedings, as experienced by one lawyer in several cases, the events are seen from the risk that people take: a person on the ground can do nothing to prevent an accident and the pilot is therefore almost always the person who, being able to act, is being convicted. Evidence and a verdict in a criminal case makes a civil case easier: all evidence has been shown in court for a criminal judge and there is no new burden of proof for the claimant.

Disciplinary proceedings might lead to less prosecution, but are at the same time a second punitive system, while they can both be used at the same time. Disciplinary punishments might be useful when there will be less prosecution and there are balanced agreements made with the Ministers of Transport and the Minister of Justice or the Board of Procurator-Generals.

case on behalf of the next of kin) and almost 11 years (civil case on behalf of the next of kin) to settle and finalize.

Disciplinary proceedings also might lead to advantages for most parties when the proceedings are open and objective, which can be achieved by procedural safeguards. Persons who have gone through disciplinary proceedings are less stigmatized than those who have gone through the judicial proceedings. Disciplinary proceedings have more possibilities to take appropriate measures than criminal proceedings.

Organisations involved in safety investigations will in general themselves start looking for improvements and implement them as well, as they feel responsible for their product and towards their employees. Organisations on the other hand will be less open and become more restrictive in giving information when judicial authorities follow a hard line of prosecution.

A mentioned point of improvement is the openness and quickness from the judicial authorities to answer the question what will be done with persons involved in an accident or incident.

Paragraph 5.6: the judges

Two judges were interviewed. One judge (also being a judge of instruction) had experience with safety related cases (in the medical world and in aviation). The other judge had experience with aviation related cases.

Both judges handled cases in penal court, one for almost 10 years and the other for more than 10 years. One judge, having been a prosecutor as well, had handled several safety related investigations, among which accidents and incidents in aviation and the medical world. The other judge mainly had experience with road accidents, but also had held a pilot licence.

In general judges have no knowledge about international aviation regulations and aviation safety but they are trained to find this information and once they start with cases, they broaden their knowledge where necessary also with international regulations. A judge of instruction has more freedom to investigate than a judge in a penal court.

Mandatory reporting of incidents was compared by both judges with the problem around euthanasia: in the course of years the requirements to exercise due caution have been accepted as they were given in the form of verdict with jurisprudence. One judge stated that it becomes the question: "Would someone after reporting an incident incriminate himself because he was mandated to report and is this therefore illegal?". It requires very cautious behaviour from the prosecutor and the police.

Not reporting incidents can be caused by absence of trust, by shame to report or other reasons like organizational culture. Forcing people to report without the safe environment to report is of no use, especially not in cases where gross negligence might be part of the incidents. Wilfully not reporting incidents on the other hand can be seen as a suspect behaviour and this might lead to suspicion from the police and prosecutor and the idea that there are things that have to be hidden from daylight. Trying to keep the prosecutor out of an organization might lead to distrust and an overreaction from the prosecutors' side.

One judge stated that he only should give an opinion about mandatory reporting when it concerns information which was given by the suspect without the recognizance that he needed not answer the questions. The principle of *nemo tenetur* should be realized by the police and prosecutor and statements given by suspects without having been given the recognizance or given under pressure should not be hold against the suspect.

The antagonism of the open culture in aviation (from way back) is that it is now becoming less open, certainly in cases where prosecutorial agencies is looking "over the shoulder". This might be caused by lack of trust. To inspire and to stimulate people to report requires a change in culture, and certainly not sanctioning behaviour when people do not report.

The judicial system ought to be used in cases of wilful behaviour, gross negligence and carelessness as well as cases of sabotage, terror, working while intoxicated and non-natural death. In cases of errors or minor mistakes it is questionable whether police and prosecutors have to investigate and prosecute. In the first hours or days after an accident or

incident there has to be a assessment whether to continue or not and clarity should be given as quickly as possible to those involved. An orientating investigation to establish the facts can be suitable and sometimes even necessary in cases of a non-natural death, as is normally done in accidents. The prosecutor acts on behalf of society and the judge has the final verdict.

Starting point is that front line operators never have the intention to make errors and one has to accept that there might be technical or human fallibility without wilful intent. One judge stated that where an Accident Investigation Board established that the accident led to punishable or negligent behaviour, a meeting should be adjourned with the judicial authorities about the facts, but the analysis of a human error was the exclusive are of the Accident Investigation Board. Cooperation between the investigating agencies was seen as an important issue by the other judge.

Evidence is always recorded and should be available for both parties, safety as well as judicial investigations. The starting point ought to be that learning from accidents and incidents prevails as they come from the fallibility of the human.

As society has or might have an interest in the investigation by police and prosecutor, especially in those cases where judicial punishment is needed or the impact of an accident or incident on society makes a judgement necessary, we have to accept these investigations as being a part of society and it is the judge who finally decides.

In relation to the discretionary space of prosecutors to prosecute or not one judge has no opinion on this. The only possibility that a judge has is to use his power to sentence: the height of the penalty or not to give a penalty at all. In this sentence he also looks for other items related to the suspect: all personal circumstances can play a role.

Goals of punishment are to confirm the norms to society, to reprise for human grief and to prevent things happening again (special and general prevention). Punishing people is restricted to judges. Where administrative sanctions are applied they should not act as punishment although they might be felt as such, and have to be known to the judges who give their verdicts in cases.

Safety is better served with a thorough independent investigation and the prosecutor should be reserved.

National jurisprudence has a power of law, even where legislation is a dynamic environment. Jurisprudence coming from other countries might be interesting for judges, but are based on another national legal system and it has to be produced by prosecutor or lawyer. No case is the same, nor is case-law always applicable on other cases. Judges “fill the holes” in legislation, left by the legislator. An exception to this is the jurisprudence coming from the European Courts.

As for disciplinary proceedings, one judge was of the opinion that it was of no use in aviation: there is a need for an expert committee to assess cases and the establish whether behaviour is without or outside the boundaries. The other judge’s opinion was that it should be clear where cases would end: for the penal judge or the disciplinary judge.

The threat that a judicial investigation might be disadvantageous for safety investigations were approached different by the two judges: one stated that there might very well be a disadvantage for safety, but that this should not lead to a situation where the judicial system should not act. It looks like blackmail to state that no reports will come when people are prosecuted. The severity of the event should be leading to assess whether a prosecution is necessary or not. The other judge was of the opinion that more than 90% of the human acts are not caused by negligence but fallible humans and machines: it is only a very small percentage that might have to go to prosecution. There is more value in the safety investigations and prevention of future accidents.

Decision to prosecute are based on more than one item:

- the interest of public accountability towards a judge;
- when the suspect has shown to be aware that his behaviour was incorrect;
- when the suspect is weighed down by what he has caused;
- when the suspect shows not to know what he has done wrong or blames other people.

Concerning international regulations, one judge was of the opinion that international regulations are an orientation to establish own legislation, but not everything can or should be accepted integrally. Sometimes international regulations might be contrary to national regulations. In the end jurisprudence will fill the holes in legislation: ethical dilemmas will be used by judges and not every detail can be arranged in regulations. The other judge stated that national regulations ought not to be contradictory to international regulations.

Judges see final reports of Accident Investigations Boards as expert reports and there should not be a prohibition to use them in court: any report which is of use for a judge should be allowed to be used in court. Where they are used, they should be used in their totality: an incomplete report might give a wrong picture. An area of specific interest is that of self-incrimination caused by the mandatory cooperation with safety investigations of the Accident Board.

Areas of improvement are:

- better communication and less fear for the other party;
- safety should be leading;
- clear criteria for prosecution and a prosecutor that acts with great reserves in the selection of cases that are to be prosecuted;
- improvement of trust towards each other;
- no hostility or battles for competence between investigating bodies;
- the presumption of innocence should be the start of an investigation, like judges have;
- but complete openness and sharing of information when dealing with wilful behaviour, gross negligence and carelessness as well as cases of sabotage, terror and working while intoxicated.

Paragraph 5.7: the Civil Aviation Authority

One director in the Dutch Civil Aviation Authority was interviewed. This person is fully knowledgeable about relevant international regulations (ICAO as well as Eurocontrol as well as JAR and EASA) about accident and incident investigations. He also knows the concept of Just Culture and spreads the ideas of Just Culture within his own organization.

Paragraph 5.7.1 International and national regulations

He stated that international regulations should be transposed in national regulations (although dynamic referencing is preferable) as this leads to clear legislation for everybody. With respect to the national regulations, he holds the opinion that there are improvements possible for data protection in relation to the reported incidents, and attached to this, protection of the reporter, while the prosecutor should act less prominent and more restrictive. This problem is difficult to tackle because:

- the government is not working on the basis of mutual trust;
- to change this, a change in culture is necessary;
- each part of “the Netherlands Ltd” acts for itself and there is often no coherence in policy and in legislation;
- too much thinking and acting is based on short term gains;
- experience, knowledge and trust are pivotal for aviation in the Netherlands;
- changes in management are contra-productive for these issues.

According to his opinion there has to be more intensive cooperation between lawmaking lawyers and expert working on the contents. The experts shall have to put in writing how things have to be organized in society and this has to be translated by the lawmaking lawyers. At present, this is the other way around leading to badly written legislation.

Authorities should not fix every possible problem in legislation (not “up to 6 decimals behind the comma”) but give the framework for the aviation sector and sector itself has to fill in where the authorities have stopped, based on the understanding of the direction of the regulations. This is the system with “acceptable means of compliance”, that is working as wanted in the Netherlands. Within Europe other countries have a culture where everything has to be written down “up to 6 decimals behind the comma”.

Paragraph 5.7.2 Investigations

As far as investigations are concerned that start after an accident or a serious incident, there is a difference to be made between commercial and general aviation. Because of the professional attitude in commercial aviation and public responsibility the priority on investigation has to be on the safety investigation. The exception is where there is evidence that this attitude is not present. The prosecutor has to behave restrictive: there always was an open culture even without this being expressly mentioned in legislation. Because of actions of the prosecutor the aviation sector can be thrown back in time and trust has to be built from scratch.

In general aviation the attitude towards safety is different and less present.

Because of the difference in the terms of reference between the safety investigation and the judicial investigation, it is understandable that there are two investigations, although it is a waste of time and money. Better cooperation between organizations would be good.

Paragraph 5.7.3 Prosecution and punishment

It is impossible to have the prosecutor not being involved in an accident, especially when casualties are involved. The way of working at present by the prosecutor might be related to the present culture of accountability that is visible in society. Giving information to the prosecutor after having it filtered by authorities might be a solution. The given information must be factual: no analysis, no opinion, no exchange of information from other sources which have reached the authorities. Punishments are not the proper interventions in commercial aviation as more intervention methods are available.

Although it is difficult to draw the line where the prosecutor must act where he must be restrictive, it is clear that judicial interventions are a necessity when alcohol or drugs are used in combination with aviation activities as this is intolerable in society.

It is not by definition that there must be a judicial investigation after an accident or (serious) incident but if there have to be more investigations, these should be performed based on a multi-stage system where safety investigation has priority over judicial or administrative investigations.

Aviation is not “above the law”: it has to abide the law, if it were only on the basis of legal security so enforcement is necessary. Professionals who work with a great degree of responsibility, must be treated in a different way than other persons. When organizations do not understand this issue and act in a different way, e.g. for economic profit, enforcement in some way must be done. The way to prosecution and judicial punishment is a last resort.

Protection of reporters is of importance. The policy of the prosecutor and what will be prosecuted must be stated in clear language in order for people inside aviation to know what will happen after an accident or incident.

Paragraph 5.7.4 Disciplinary proceedings

Disciplinary interventions can be as destructive for safety as prosecution. What we really should achieve is to improve system safety in aviation.

Paragraph 5.7.5 The legislator

Politicians have little understanding about the prevention of accidents and incidents. Questions that arise after an accident or incident show interest but no expertise and it is sometimes difficult to understand what politicians want. The way of working of Parliament seems to indicate that they are working on the details instead of the more general lines. But aviation safety and politics should be kept apart as much as possible.

Vague articles like article 5.3 in the Aviation Act are without norm and should not be present in legislation: there are enough other articles if you want to enforce. Even as a last net, the article is useless as it can be used in a lot of cases, leading to some interesting jurisprudence but that also makes it of little substance.

Paragraph 5.7.6 Improvements

Items of improvement are:

- more aviation expertise in the aviation accident investigation board;
- final reports have to come quicker to prevent nonsense;
- own investigations by the authorities for accidents and incidents with people who know how to investigate and who have the expertise about the field they investigate;
- non-punitive protection as this is a point of concern;
- trust is an import facet between authorities and the sector: without trust there is no cooperation.

Long term solutions are like the master of cognac: he makes something that he does not see on the market himself, but it is good.

Paragraph 5.8: former members of the Accident Investigation Board

Three former members of the Accident Investigation Board were interviewed.

The three member had all been active in several parts of aviation and experienced ranged from 7.500 flying hours to 18.000 flying hours (average 13.160 hours; average years in aviation 43,6 years). All were requested to become a member of the Board, based on specific knowledge and experience. During their time on the Board they were involved in accidents ranging from small accidents with gliders in the general aviation to accidents that attracted world-wide attention.

Paragraph 5.8.1 Reporting incidents

Reporting incidents is seen as useful based on some conditions:

- the purpose of reporting is safety improvements;
- the goals for reporting must be made clear to the front line operators;
- reporting should be made as easy as possible, otherwise no reports will be filed;
- there has to be a follow-up after reporting the incidents;
- there must be a feedback to the reporters as people might get the feeling that nothing has been done with the reported incidents;
- there is at present too much that has to be reported;
- improvements can be made in general aviation and it is questionable whether people in general aviation are familiar with the reporting requirements.

The importance of reporting might become less important in the near future between 2009 and 2020: more items are and can be monitored by organizations like airlines, airports and air traffic control organisations.

Reporting incidents cannot be exacted from people. Motives for not reporting that were mentioned are:

- fear for the consequences either prosecution or sanctions from the own organisation
- shame;
- paperwork that is related to reporting;
- “it is not my task to report”;
- the incident is seen as insignificant (“I did learn and why should another person take time for it”);
- errors and mistakes are made by everybody;
- being angry about what happened;
- people do not know what is mandatory to report.

An example was given by an interviewee about not-reporting an incident and was related to a landing clearance to an aircraft on final and shortly after a take-off clearance to an aircraft for that same runway before the first aircraft had landed. The controller had requested the pilot of the aircraft that was about to take-off, to not report the incident in order to not cause any problems for the controller. The pilot did not report the incident as he did not want to be the cause of trouble or punishment for the controller.

Paragraph 5.8.2 Investigations

The common opinion was that those cases where it is obvious that nothing can be learned from the incident or accident, should not be investigated: there are lots of incidents that are a recurrence, well known in aviation where nothing can be learned. What has to be investigated are, apart from the obvious cases like accidents and serious incidents, safety related issues that show the workings of systems.

The investigations should be done by an independent Accident Board which has knowledgeable investigators. The judicial system is not seen as knowledgeable as it is not well-enough equipped. A prosecutor should know the world of aviation and should be knowledgeable to a level that he can make early decisions whether to prosecute or not, taking into account the possible system related issues that might be present in an accident or incident.

Society also has its requirements for the judicial system in cases of causalities and disasters. Where investigation learns that there is wilful misconduct or gross negligence the prosecutor has to act within his discretionary space.

Paragraph 5.8.2 The right to prosecute

One interviewee stated that there seems to be an opinion in the Netherlands that the prosecutor should not have the right to investigate, but the prosecutor has an indefeasible right to investigate. Where this right is used, it should lead to an investigation which is done on the own power and knowledge, and not as a part of an investigation of another organization. Setting the prosecutor offside is seen as undermining the rights of the prosecutor which might lead to a loss of trust between prosecutor and aviation sector. Investigation have to be done based on the principle of discretionary power. At present the prosecutors are more present in safety related cases than 10 years ago, not just in the Netherlands but all over the world.

Paragraph 5.8.3 The Accident Investigation Board

An Accident Investigation Board should not investigate or report slower than necessary in order to have the prosecutor come to a decision before a final report is released. The investigations should be done as accurate and as timely as possible, but investigations take their time to come to the right facts, the right analysis and the right conclusions. Final reports are public material; discussions about the use of the final reports by the prosecutor should not be held. Either they are there to be used or not, but the decision not to use the final reports might also be detrimental for the suspect in a judicial process.

Comments on the report of a Board should be taken serious. They are signals that can be used to improve the report, as even investigators of a Board or the Board itself can overlook items. When a report is finalized and comments are given based on new evidence or new circumstances that indicate a clear cause, different from the stated causes, the Board should reopen the investigation and write a new report.

Safety information is not the property of a board but of society, although the board is a guardian of the information. The information should be released to the aviation sector and the public as soon as the facts have been established and where a safety improvement is seen.

Paragraph 5.8.4 Punishment

In relation to punishment the following remarks were made:

- there was a time where punishment was possible but sometimes not done as it might harm the career of people;
- a point of departure for (not) punishing should be whether persons have acted responsibly and with discipline as this shows a certain attitude: aerodynamic decelerations on the runway are not done and are potentially dangerous, which is not to be accepted from pilots;
- as there is no disciplinary punishment in aviation, it is predictable that the prosecutor fills this gap;
- punishment requires knowledge of the aviation sector;
- where punishments are given, they should be obviously related to the severity of the accident or incident;
- punishments are only necessary in cases of wilful misconduct or gross negligence, but punishments should be given with prudence;
- gross negligence should be established by a judicial court within the existing legal system;
- front line operators will not conform to the rules because of possible punishment and it might hinder their work instead of helping their work;
- society has a different view: there must be a scapegoat as a way to satisfy society;
- the penal system is not the proper system in case of complex socio-technical systems: aviation knows many actors with a partial responsibility to come to the total safe result, where the penal system is written for the person who acts and not the system;
- punishments should also be made possible for organisations.

Disciplinary punishment is not by definition seen as a possibility to improve aviation safety:

- assessment in a disciplinary system comes from expert in the system, but an equally good possibility is a special “aviation chamber” in a Court of Law which has aviation experts as lay judges;
- the aviation authorities could also act with administrative rulings and punishments;
- ICAO has chosen, in the past, to abolish disciplinary proceedings from Annex 13 and there are no indications that it has to return;
- one advantage of the disciplinary proceedings might be that the prosecutor will be less active.

Paragraph 5.8.5 ICAO Annex 13

Annex 13 (ICAO, 2001) is seen as the best compromise in the world and agreed after years of deliberations and it should be used as the base line for national regulations. A State has to comply to the international agreed rules. All arguments and contra-arguments

concerning the contents of Annex 13 have been given in the ICAO meetings and can also be seen in the discussions in the national political arena when discussions are going on about national law. Annex 13, when literally adopted, has to be used for national regulations as it gives clarity in the international aviation arena.

The other side is that Annex 13 holds no regulations concerning prosecution as ICAO has a mandate for aviation and prosecution becomes a national issue. States never could agree about this subject and protection against prosecution is therefore impossible.

A State has a national obligation towards society when prosecuting persons after an accident or incident. The problem of concurrence can only be solved in good faith between the parties that are involved.

The question how to treat people who do not report accidents or incidents leads to different reactions: exacting information from them is not a solution, punishment is not a solution. Voluntary reporting has shown its advantages in the USA, but long lists with mandatory reportable items have no value as people can never know all items that have to be reported. There is no solution mentioned for this problem.

Paragraph 5.8.6 Cooperation

The question of non-cooperation with investigations leads to a mix of answers: there is hardly a thing one can do and persuasion is the best solution. On the other hand it is mentioned that it is part of the accepted job, part of working in a safety system, where people are accountable for what is being done. It is a societal requirement where people in aviation cannot state that they ought to be treated differently. One interviewee stated that persons should be brought to court for not-cooperating with investigators.

Paragraph 5.8.7 Use of final report in other proceedings

Mixed answers also come from the question related to the use of the final report of an Accident Investigation Board by the prosecutor and in court:

- a report is open and public material so the use cannot be prevented;
- when a report is not open and public material, it cannot be used at all;
- it can be used by a prosecutor as steering material in an investigation;
- a ban to prevent the use of final reports will not be very useful;
- the words in a final report should be chosen with care: sometimes words can be useful in a sector but not in court.

Paragraph 5.8.8 Improvements

Improvements that are seen in this group are:

- a better protocol that manages the differences between the two investigations of a safety board and the police and prosecutor;
- a competent judicial system with improved know-how at all levels, including the judges;
- more attention for the human factors and human errors in the accidents and incidents;
- open assessments whether a certain case will be prosecuted or not, in order to gain or regain trust.

The investigations should be kept independent but open for the protocols.

An ideal investigation is performed by an independent organisation:

with experts

- collects the facts without analysis and discuss the facts with others than the investigators for newer and sometimes better insights, for new expertise;
- incorporate experts with knowledge about human factors and human errors;
- don't deviate from the ICAO norms;
- accept the role of the prosecutor and it's right to investigate;
- the prosecutor should realize that the discretionary space is applicable in every single case.

It has to be accepted that society is changing. There is a continuous battle between the prosecutor and safety investigators which can be arranged in protocols, but which can never be ended.

Paragraph 5.9: representatives of the media

Two representatives from the Dutch media were interviewed. One person works for a TV news program and the other for a quality newspaper. Both had previous experience in safety related accidents and had an accumulated experience of more than 50 years.

The media are seen with the following functions:

- information about an accident or disaster towards the public
- checking the government for performing it's duties, sometimes acting as a watchdog
- showing feelings of unsafety, the perception of risk and the emotional side of disasters towards the public.

Disturbances in safety and especially disasters can reach the heart of society and can cause unrest and uncertainty about existence in society, and information is then of importance.

Paragraph 5.9.1 Task of media

Both representatives saw it as the task of the media to inform society as objectively as possible about the issues that are present in society, to unlock the truth of these issues. One of them stated that there also is a task to point out issues that are present in society, to look for dissatisfaction in society, to explain macro-problems on a micro scale, while journalism is also the fourth power in society by checking government and government agencies. Profoundly stated this would condense in guarding democracy by giving the necessary information, and in this sense journalism is the watchdog of society.

As far as accidents and disasters are concerned they stated that journalists have the obligation to inform society about who, what, where, when and how, and as far as is possible to give this information in relation to causes and background, although these last two were often only possible in phases. As far as incidents are concerned this also might lead to more consciousness of society.

They also both stated that the general public is curious and this curiosity is related to the given information. The curiosity is often related to the issues that have an effect on people's personal life. One of these two stated that news items have, for several years already, a "colouring" of the news and a greater part of society cannot do without this colouring.

Paragraph 5.9.2 Knowledge about legislation

Knowledge about legislation around accidents and incidents can easily be found, in the past by having the legislation available at the offices and at present through internet. Editorial staff will find sources, preferably experts, whenever necessary in order to find or comment on information that is available.

Paragraph 5.9.3 Safety and society

Safety is an important issue in today's society and the public in general is very interested in items that are safety related. One journalist stated that the impression was that this has

grown since the turn of the millennium: after this turn Dutch society had experienced several important issues where safety was an important issue, like the fire in a discotheque on a New Year's eve, the shooting of a politician and the stabbing to death of a film director. Journalists represent society and raise questions that are related to safety of society in general. In the end, these questions are always related to questions about the responsible persons.

Paragraph 5.9.4 Reporting incidents

In relation to this subject they both see the reporting of incidents as an important issue in order to have the appropriate authorities know what is going on in a part of society. From their own point of view reporting was seen as important to come to the correct conclusions for news coverage to society. All public information that is available to the Members of Parliament are also available for journalists.

Reporting however cannot be done in isolation, as journalists want to know the context: without context the information is useless. An example for context is the information given by a Minister to MP's about a chemical substance in the cargo of an airplane, without any other information where investigative journalism later revealed that the chemical substance could be used to produce a poisonous gas.

It was furthermore stated that where authorities give no follow-up to the reporting of incidents, the authorities have to change their attitude and/or behaviour.

Asked why incidents were not reported the following reasons were given:

- fear for the consequences (reprisals) within the organisation or from external parties
- loss of face
- no promotion

where this is all related with the culture in an organization and in society.

Paragraph 5.9.5 Investigations

After an accident of an incident an investigation has to be performed and society has to be informed: clarity is of utmost importance. In the end the investigations should lead to improvements of the system. One journalist stated that there should be an automatic follow-up about the available information from the organization that deals with the investigation without the media having to ask for it.

Investigations have to be performed by an independent Accident Investigation Board with experts from the field that is investigated. Investigations should also be performed by the organisations that are involved in the incident ("the butcher must know his own meat"), as well as by the judicial authorities. All organizations have a duty towards society to give the information about the accident or incident where the information can be given.

Not giving information raises suspicious feelings and leads to hear-say and speculations. An example was given in the form of a nuclear power station that used to be very closed in the exchange of information, but the station changed its policy in this subject which has lead to the situation where there is no or hardly any suspicion towards this plant.

The conclusions of an investigation should be public, also when this concerns the own organisation: the public is to be informed. With care specialist knowledge should be given when the general public can not be placed in a context.

Paragraph 5.9.6 Judicial investigations and prosecution

Judicial investigations are seen as necessary in today's society. Those who are the victims or their next of kin have the right to know what has happened. There is also a sense of justice in society that has to be satisfied. Society also wants to know who is responsible and who is to be blamed. Even when nobody will be prosecuted a thorough judicial investigation is necessary. It should become clear to society whether the organisations that are involved in an accident or incident have been working according to the rules.

As for the cases where a judicial investigation was necessary it was stated that this should be done when there are casualties or in cases which lead to a shock in society.

One of the journalists was of the opinion that in prosecution cases the judges should have access to all available information in order to come to a proper assessment of the situation surrounding an accident or incident, and even the final reports of an Accident Investigation Board could then be used. This is all related to the sense of justice in society. The other journalist referred to the legislation on this point.

"Honest" mistakes by operators should not be prosecuted (stated one interviewee) unless there are casualties (stated the other interviewee). If this should lead to less reporting of incidents, this was seen as a wrong signal to society as a whole. "Honest" mistakes can be defended by management (after an assessment about the mistake was made). Not reporting should be circumvented by having systems work for you: even when people do not report, the technical possibilities of the system should lead to reporting of incidents. There should also be a knowledge in front line operators that they can be checked for reporting incidents, which should add to the willingness to report incidents.

Paragraph 5.9.7 Disciplinary proceedings

Disciplinary proceedings are, from the point of view of one interviewee, in general not seen as a value towards the sense of justice in society: people might have the idea that one does not foul one's own nest and the idea might come up that there will be no improvements. The other interviewee referred to the possibilities of disciplinary proceedings to have a regulative effect on people.

Paragraph 5.9.8 Following safety events

Safety related accidents and incidents are followed by the media as this is related to the curiosity in society (as stated earlier). There also is a necessity to follow these accidents and incidents and Freedom-of-Information legislation is not seen as assisting the media to receive the requested information, despite the task that the media have towards society. As journalists are not able to perform all the investigations themselves, they depend on the organisations that have performed the investigations. No answers and closed doors have a negative effect and organizations must not duck for the questions from society.

Improvements, as seen from the perspective of the media, are:

- to train people from the start in ethics of their profession, including the importance of reporting and improvements, leading to people who are proud to see their share in safety improvements;
- more and detailed information about incidents to become available to the media;
- an improved climate in society to talk about safety and safety improvements
- accept the consequences of actions, done by operators in risky environments, even when things go wrong.

Paragraph 5.10: aviation insurance companies

Three persons dealing with aviation insurance were interviewed. Two of them were mainly related to insurances in the general aviation and the other in the commercial aviation.

It was expected that the insurance companies could play a role in safety for general aviation and/or airlines. This expectation was based on the knowledge from the automobile world where the policyholder can get a reduction on the policy costs after a period without any claims of damage. The expectation was also based on the knowledge that a policy might include only a limited number of persons or persons mentioned by name on the policy with a certain experience (usually expressed in hours of flight time), for them being allowed to fly an aircraft within the limits of the policy.

In the following a difference is made between general aviation and airliners.

Paragraph 5.10.1 aviation insurance and general aviation

Interviews have learned that insurance companies in Europe accept what is being offered by the policyholder and that government agencies would regulate and enforce the regulations around licences. When the required policy is just for third party liability the insurance company just checks whether a pilot holds a valid licence. Experience becomes part of the policy when the aircraft has to be insured as well.

Insurance companies have no will to influence behaviour of pilots to come to a safe operation as this is seen as a government task through enforcement. Insurance companies are therefore passive and act only after an accident has happened to settle claims.

It was mentioned that the situation in the general aviation in the United States is different: insurance companies try to identify the risks by checking a pilot's experience.

Insurance companies therefore only handle the wallet and the money: they deliver money after an accident and try to establish whether the pilot abided to the legislation. This is mainly done by a claims assessor. They also have the authority to state what will happen with the aircraft, based on the "underwriters will: replace or repair".

Third party damage is settled by the insurance company.

To settle the accident any information can be used. The claims assessor will do the investigation on behalf of the insurance company and the insurance company will try to settle cases as soon as practicable. When casualties are involved, claims are sometimes settled through a claims lawyer. Insurance companies normally do not wait for the final reports of Accident Boards as this usually takes too long and could do more harm to the injured or the next of kin. Insurance companies will try to settle claims as soon as possible as they are like any other company: it is economy and they want to know how much profit came from their activities.

Normal mistakes are covered by the policy. Violation of regulations can lead to a situation where the compensation is not given: an insurance company cannot be held to compensate when the pilot behaves in contradiction to the law. Generally speaking most pilots do not

know what their own position is, nor in a judicial way nor flight technical nor claim settlement. The origin of this is that they do not take time to get the knowledge.

When a prosecution comes after an accident, the insurance company holds the right to return to the original situation at the time of the accident and they might require a refund from the policy holder of the (already given) settled claims. Not adhering to the law is a situation where the policy might not be valid and information from police investigations and/or prosecutions can and might be used.

Police investigations and judicial proceedings are in general seen as a threat to aviation safety: there is less to learn as people will not speak about what really happened and where the chances of a prosecution are greater less information will be given, a punishment adds nothing to the facts and can be seen as collection by the government. An exception is made for those cases where people fly while intoxicated and those people who, on numerous accounts, violate the legislation.

Ideally the situation would be:

- social control of behaviour of pilots and controllers within their own working environment
- disciplinary interventions when the social control of behaviour does not lead to the proper results
- prosecution and trial when disciplinary interventions do not lead to the proper results.

Disciplinary interventions might lead to a culture where people cover each other's behaviour or might punish harsher than would be done in a criminal court. Disciplinary interventions should have the goal to have people adapt their behaviour in a direction that is within the legal limits.

Paragraph 5.10.2 aviation insurance and airliners

This area differs from general aviation. Conditions and requirements that can be put on airlines are hardly present, where in GA you can have requirements on insurance policies. There are lots of regulations from the authorities and the insurance companies can only come to a mutual understanding. There is no connection between an SMS in an airline and the insurance company.

In the airline business, premiums and conditions are driven by market conditions: capacity and conditions in the market. When looking at the regional differences, there are different premiums (because of the safety records) and different amounts of money to be paid after an accident because of civil litigation.

As for the investigations of accidents by insurance companies the policy is that either you go there on your own, investigate and come to conclusion, or appoint an adjustor who does the work. When handling claims in airlines the lead insurer appoints a claim adjustor to do the work, report on the physical evidence, and use lawyers for the liability. In most cases everything is just clean. There is a wish to settled out of court, more than in court.

If the accident is a lethal accident, the official report of the Accident Investigation Board will be there after quite some time, but these reports normally make no difference. The insurance company wants to go forward. There is some subrogation when new information comes to the insurance company.

Prosecution is a different thing on whether they are used or not, but is very different to give one line that covers it all: there are too many regulations in policies.

As for civil claims the insurance will always first settle the case with the airline for the hull and the passengers for their losses through lawyers. The insurance companies will later see who has played a role and might be negligent. Insurance companies are much closer to the airlines, to the customers, than e.g. in road accidents.

In the aviation community things have been transparent where incidents were reported and there was no penalty on that. There was learning from accidents and incidents. Criminalization leads to negative effect because people will report less. The non-punitive system is good for aviation, but the public does not understand this. Disciplinary punishment is no different from criminal punishment: it still is punishment.

There are very few accident reports (worldwide) that require prosecution.

Compliance to regulations is the bottom line for the insurance company and the policy might not be valid if you do not comply.

Paragraph 5.11: Member of Parliament

It was hoped that several Members of Parliament would be interested in an interview and the personal requirement was to have at least four MP's spreaded through Parliament to have the ideas of the majority. One Member of Parliament agreed for an interview and three were not interested in an interview. It is therefore difficult to come to general statements as the information given is a view from one person of one political party.

Paragraph 5.11.1 Legislation and Just Culture

This MP had limited knowledge about ICAO and no knowledge about other international regulators like EASA. In accordance with his party policies he stated that international conventions have to be adhered to and he is not in favour of national differences.

He was familiar with Just Culture (as concept) but did not fully agree with it. Human error, which is part of a system, should not lead to prosecution and on the other hand if the person obviously violates regulations he should be held accountable for that. This leads to the fact that an investigation is necessary to establish what happened and under which circumstances. In cases with casualties there should always be a place for judicial investigation.

The legislator is not always able to make legislation "up to 6 decimals behind the comma" and judges are there to decide when there are discrepancies in legislation. When a sector is involved that requires special knowledge, this knowledge must be available and used.

Paragraph 5.11.2 Judicial investigations and prosecution

Judicial investigations, performed by police and prosecutor, are part of society and just as necessary as safety investigations. Where there is a threat from judicial investigations, people are less inclined to talk about mistakes and errors, incidents and accidents. This counts all the more in a shrinking economy with less possibilities for improvement. According to his opinion a claim culture is killing when talking about safety problems and improvements. At the same time a general article in the law like article 5.3 of the Aviation Act, is always necessary as a last net.

It is questionable whether a judicial investigation must be performed when there are obvious system errors. The goals of a judicial inquiry should therefore be to find the truth but immunity (e.g. for front line operators) is not a solution: it leads to unwanted behaviour. It should be clear cut which information is transferred from a safety investigation to a judicial investigation. The other side of the same coin is that the prosecutor must give clear information on when to prosecute and when to dismiss and this information has to be given as soon as possible.

There ought to be an exchange of information between the investigating agencies to prevent tension between them: things have now been arranged in a covenant but it has to be arranged in legislation. The problem of priority of investigation should also be regulated

and one could say that in cases where technique failed the safety investigation has priority and where the human failed the judicial investigation has priority.

Investigations should be done for all accidents and (serious) incidents, but prosecution only for those cases with intent. The priority of the investigation might shift in those cases where the investigation indicates that the border of negligence and intent is found: where there is intent, the prosecutor has priority and where there is some negligence the safety investigator has priority.

Paragraph 5.11.3 Accidents and society

Accidents lead to a political reflex, and it is impossible not to have it, about responsibility. This reflex will be more substantial when the risk for society is greater. This is seen in all democratic States. Where society might have the biggest benefit coming from system improvements, the public perception is to see people being held accountable: heads have to roll.

Paragraph 5.11.4 Disciplinary proceedings

Disciplinary proceedings are not to be added to aviation: the number of incidents is too small, despite the fact that new legislation about this subject is being made.

Paragraph 5.12: comparison interviews

To compare aviation with other safety industries interviews were held with three persons from the medical world (one being a clinical trial manager, one being an eye surgeon and owner of an eye clinic, and the third one being a cardiac surgeon working in a great academic hospital), a ships pilot, and with a representative of a safety advisory firm.

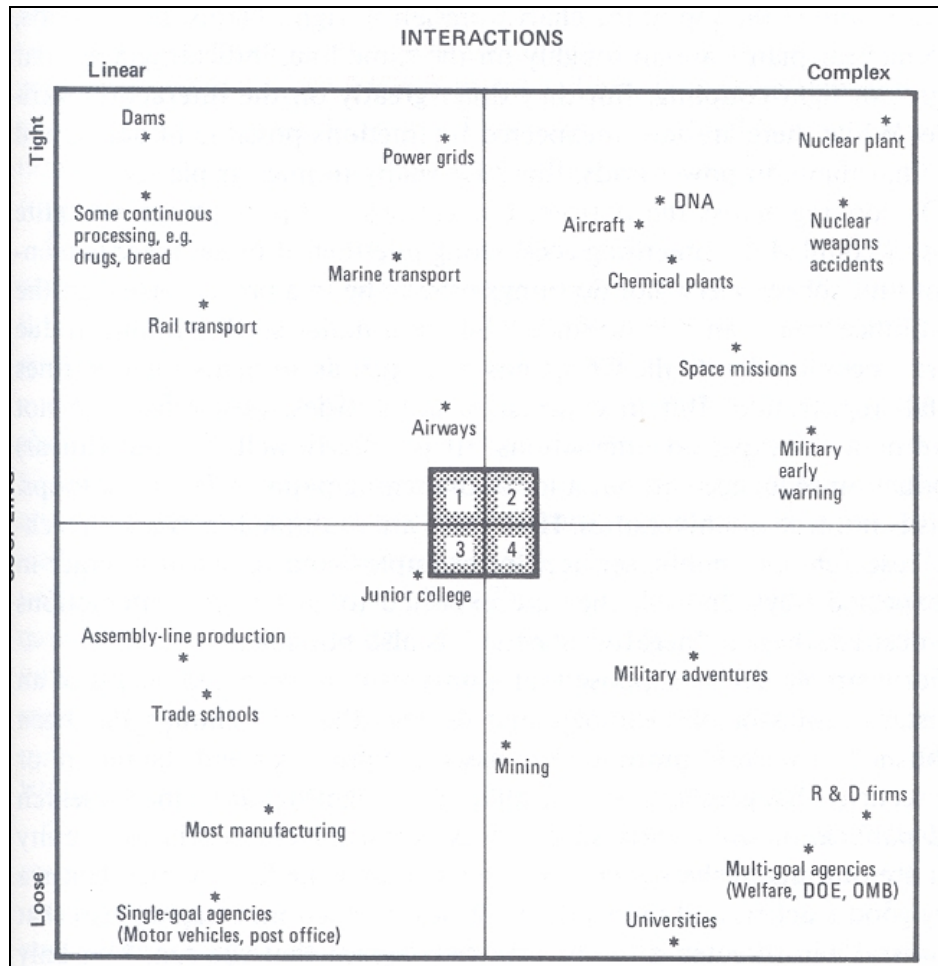


Figure 6: the Perrowian Complexity Chart

Not all of the interviewed persons worked in an environment that is complex and tightly coupled: the representative of the safety advisory firm performed safety investigations in the railroad and road transport world i.e. a very visible world when things go wrong. The medical world has its own problems with patient safety: a retiring GP told once that every doctor in the medical world has his own graveyard. So would they be treated different by the judicial authorities when accidents or incidents happen?

Paragraph 5.12.1 The medical world

The medical world has its own death toll in the Netherlands: Leistikow stated that, in 2007, 1735 patients potentially did not have to die in Dutch hospitals and 6.000 patients received permanent physical damage, which could both be avoided (Leistikow, 2009). Three different persons in the medical world agreed for an interview about accidents and incidents in their world as a front line operator:

- a clinical trial manager handling data of trials with new medicines which were tried on patients without these medicines being admitted by the authorities on the market for normal use;
- a cardiac surgeon working in an academic hospital
- an eye surgeon working in a private hospital.

Paragraph 5.12.1.1 The clinical trial manager

With an experience of 12 years in position his job was to collect data during clinical medical trials with new medication on patients. The research work is part of the development of new medication and is bounded by strict rules. It is an expensive development as it takes years of research and trials and success is not guaranteed.

When during trials there is a situation with “adverse development”, this development has to be reported to the appropriate authorities; this report has to be done by the chief-investigator as the sole responsible person for the trials. There are several lines of follow-up investigations about this adverse development after it has been reported, depending on the severity of the adverse development. It is possible that the authorities themselves do the investigation, it might be that the investigation is done by the “Central Commission Medical Research” (where all trials have to be reported) and it is possible that the chief-investigator himself investigates the adverse development.

Two different cases were mentioned during the interview:

- 1) during a nationwide trial the mortality rate was higher than was statistically expected. Investigation learned that infections were not diagnosed and people died after complications because of the infections. The applicable rules to report the adverse development were not known by people in the hospitals, where the infections occurred. Investigation was done by the authorities and this led to improvements in exchange of information.
- 2) during an international trial medication was given through a medical device. No tests were performed on the combination of the medication and the medical device. The medical device was attached to the brain of the patient and could not be removed by the patient. During the trials it appeared (after investigation) that the medication reacted with the device, leading to foaming of the medication. The pharmaceutical organisation was not willing to withdraw the medication as the project was in the final stages and the medication was about to be released on the market. Authorities were not informed. A bell-ringer did her work and informed the authorities, but she was fired by her organization, a clinical research associate.

In general, this interviewee stated that between 80 and 90% of the adverse developments were reported and that there existed no fear for the authorities. Where no report was made, this was based on the fact that there were no clear indications why the adverse development existed, while cases also could fall within the brackets of “the academic study”.

Incidents that have to be reported, are stated in the “Law on medical investigations on humans”, but there were no cases known where the authorities reported the case to the

public prosecutor, even in cases where culpable second-degree manslaughter was seen by medical staff.

The question was raised (after the interview by the interviewee), directed to the government's public information office, whether offences and crimes of the "Law on medical investigations on humans" were prosecuted by the public prosecutor. The answer stated that when the medical authorities at the appropriate Ministry were of the opinion that a case has to be prosecuted, they would inform the prosecutor about this (Gouvernement Public Information Office, 2009).

Paragraph 5.12.1.2 The cardiac surgeon

With a total experience of 22 years in the medical world of which 11 years were as cardiac surgeon he was the craftsman who was allowed to open living people. His work is regulated by law with a legal obligation to present a mortality rate of more than 10% quarterly to the medical authorities and to report, apart from this, infections like MRSA.

In his own department regular meetings were also held to discuss complications with colleagues and other medical staff. He himself had been involved in several incidents, in one given example leading to a fatality where a vein was (most probably) put in place in the wrong direction. This fatality was not reported nor was an autopsy performed.

In other incidents the incident itself was reported and investigated, but judicial authorities nor the medical authorities were seen to investigate. Whether the judicial authorities held a policy for (not) prosecution medical staff was not known.

Reports were not always made: people are afraid of the consequences like (disciplinary) punishment, intervention of the prosecutor, and reputation. Where incidents have been reported, the reports are presented in such a phraseology that reality is not traceable for non-medical staff.

In his own department, holding five cardiac surgeons, the culture among these five was open and without any threshold incidents were discussed, mainly during lunch. In the academic world there was no knowledge or power to change nor was there a cardiac surgeon who act as a trusted representative. Changes had to come from within the medical world through changes in culture but also through the patients who must know what risks are involved in his treatment. Disciplinary and judicial interventions were seen as having a negative effect on patient safety.

Paragraph 5.12.1.3 The eye surgeon

With a total experience of 30 years in eye surgery this interviewee has his own private clinics, treating patients and educating certified eye surgeons who work in his own company. This last item is done as no safety thinking has been given during academic training leading to insufficient knowledge. This surgeon started this way of working after having gained his private pilot licence.

Authorities have to be informed when patients die during surgery; apart from this he has to hold and maintain a complications register, but there are no detailed regulations about this register. As his clinics are ISO registered and hold a quality system, he has more knowledge on incidents than he would have without this quality system. Working according to the protocols is of utmost importance and every staff member in surgery has the power to stop surgery when deviations from protocols have been seen.

The other side of this same coin is that his database holds more incidents than hospitals in his region, which might indicate that his track record is worse.

Biggest risk in his world is the infection of an eye after surgery and blinding a patient because of improper treatment. Incidents must be reported to improve the product. It is difficult to get people to reporting incidents as this is “not done” in the medical world.

Judicial intervention were never seen in his career. When judicial interventions are seen, it is usually about dysfunctioning medical staff⁹. The medical authorities hardly ever intervene in the world of eye surgery as no incidents are reported. The only way the patients can go is the regional disciplinary board. According to his opinion the medical world is a closed world where no information comes from. Machismo is on its return because more female staff is entering the medical world.

Reason for not reporting incidents and accidents are, according to his opinion,

- 1) fear for repercussions;
- 2) reputation damage;
- 3) the “it won’t happen to me” attitude.

Paragraph 5.12.1.4 Other medical experience

Things can work out in a better way, as was shown in a presentation by Leistikow (Leistikow, 2009). This presentation was about patient safety and he stated that the board of his hospital declared patient safety as top priority to be solved. By introducing slowly a systematic incident reconstruction and evaluation method to learn from incidents without talking about blame and working with Root Cause Analysis, the number of reported incidents rose from less than 700 in 2004 to approximately 2500 in 2009. To investigate some but not all incidents 50 staff were trained. By spreading the word and showing results, the culture towards reporting had changed and a magazine was distributed among staff to inform them about the reports.

In a medical case in the Netherlands a Court of Appeal gave a sentence about a patient who stated that she was maltreated by the anaesthesiologist. The patient stated that she needed the medical report in order to prove that she was maltreated and that the anaesthesiologist had acted careless. This medical report was the report that was filed within the hospital

⁹ Smalhout has written a lot about this problem and has stated in several articles that medical errors stem from laziness, carelessness, indifference, arrogance, authoritarian behaviour, priggishness, overestimation of one’s power and lack of humanity. According to the medical authorities between 5 and 10% of medical staff dysfunctions. The medical authorities required stringent measures to improve the medical world (Smalhout, 2007).

concerning an incident with a patient, commonly known as a “MIP-melding”. The Court however stated in the verdict that this report was made to improve the quality system of the hospital and that reporters, where they do file a report, should not have the fear that the reports might be lead to measures taken against them, either by the hospital or by the patients or by the authorities. When the report is made public, the societal significance of reporting is severely harmed.

Legemaate stated in a note, attached to the publication of this verdict, that the legislator has to act in order to realize through legislation the safety of the reporter and at the same time to guarantee that the patient can find the necessary information (Gerechtshof Leeuwarden (Court of Appeal Leeuwarden), 2009).

Paragraph 5.12.2 Pilots on sea vessels

Although being a ships pilot does not appear to be complex as in the Perrowian Complexity Chart (Perrow, 1999) and as seen in the figure below, it still is a marine activity which holds certain risks in handling a ship near the shore and not have it run aground. A pilot must have knowledge about the ships he has to handle and he might encounter in shallow waters and has to build experience to manoeuvre a 325 meter long and 45 meters wide ship with three tugboats in a lock of 400 meters long and 50 meters wide.

Pilots have a reporting duty for accidents and incidents, although there is no formal definition what constitutes an incident. Reporting is done through a so called pilot forms which holds to official function of reporting and learning. Besides running aground with a tall ship, there are other risks associated with this work, like physical harm because of snapping ropes, running over the tugboat or damaging the locks.

Pilots work in a team of two to ten persons for a period between three and five hours and is hired as the specialist in an area.

The pilot statements have been claimed by the water police for their own investigations, although they were not meant to be used for judicial investigations. These investigations have learned the pilots that they can be subject of a judicial investigation where their own statement can and will be used against them. This resulted in the situation that less pilot statements were filed but the group itself discussed the incidents and accidents in a closed meeting where no minutes of the meeting were made. Because of the trust within the group people were open about the details of accidents and incidents.

Reasons for not reporting incidents and accidents, that were given during an interview with a senior pilot, were 1) shame about the accident or incident; 2) fear for prosecution; 3) not seeing the use of reporting (i.e. learning from accidents and incidents was not always obvious).

It was seen as a fact that because of the police investigations pilots have reported less incidents. After one accident with a ship running aground, people have become more hesitant to report and the organizations of pilots have become more careful in handling information with third parties.

Paragraph 5.12.3 Representative of a safety advisory firm

This representative has an experience of 6 years in performing incident investigation, which was partially being done as an accredited Tripod investigator. Investigations were done on behalf of other organizations (chemical plants, railway and highway organizations). During their investigations they experienced investigations of other organisations like the Dutch Investigation Board for Safety, appropriate authorities, police and prosecutor.

In one accident, where an empty passenger train drove into a cargo train and derailed, the train driver of the passenger train was prosecuted. The investigation of the advisory firm learned that the train driver had missed a red sign¹⁰ which was not expected and after this he drove towards a jumble of tracks where he saw the cargo train, but expected that this train would drive towards another track than his track. The station could not be used for two days because of the derailment, which led to reactions in the media. After this event train drivers behaved more cautious and showed more reticence in reporting incidents. Incidents like passing a red signal lead to a recertification of the train driver and their biggest fear is not being able to pass this driver test.

What has been seen in his investigations is that exposure of incidents by the media led to fear by train driver for making mistakes and being involved in the same type of incidents.

Not all incidents are reported and reasons for not reporting are:

- no knowledge of the potential effects of an incident
- a negative incentive for reporting (punishment or no bonus)
- reporting takes time and leads to a loss in production
- reputation
- shame
- fear for present or future position in the organization.

¹⁰ In the world of railroad this problem is known as “SPAD” or “Signal Passed At Danger”, where the train driver passes with a red aspect without permission. It can lead to injuries to the public, damage to infrastructure, and in the worst case many deaths. There is an annually increasing number of SPAD’s which has led to questions in Parliament and the media on what steps have to be done to reduce this number.(Dabekaussen, 2005).

Chapter Six: Analysis

Paragraph 6.1: General

The starting point to report incidents and accidents is to investigate them in order to improve the system safety. ICAO and the EU have therefore drawn up regulations from which can be derived that any other investigation (be it judicial or disciplinary, administrative or civil) is subordinate to the safety investigation. Rules and regulations are present in society in order to give clarity, be it in national or international settings. Legal insecurity exists when there is a conflict between regulations. In the Dutch regulations here exists a lack of confirmation to the actual ICAO and EU regulations.

Due to the changes in society from a risk culture to a precautionary culture, more and more socio-technological activities are regulated through licensing and authorisations. Examples of these can be found in the discussions about external safety, whether this external safety is related to aircraft flying over built-up areas or from a gas station in a built-up area. Frissen has stated that society is heading in a direction where potential risks, uncertainties and ambiguities have to be taken into account (Frissen, 2008). Society seems to have lost faith in science and politics, as stated by Ericson (Ericson, 2006) and society therefore takes more and more refuge in control techniques and penal codes. Punishment is then the outcome, as scapegoats must be found when citizens are not protected from harm (de Roos, 2001). The judicial system, police and prosecutors step in this area with the assumption that fear for prosecution will suffice to ensure that fatal accidents will not happen ((Hudson, 2001). To quote Etzioni: “we do as is expected and refrain from misbehaviour out of carefulness or love”(Etzioni, 2009), so deterrence is not the basis to confirm to regulations.

When people do have to prevent accidents and incidents happening in their everyday work and also do have to report them when they do happen, they are accountable for it. Accountability is coupled to responsibility: front line operators are obliged to tell what has happened after an accident or incident in order to prevent the accident or incident from happening again, as is the goal of an investigation after an accident or incident. Accountability is also based on trust and where no trust in a safety system exists, accountability will not be found. As people do have a free will, they will most probably not report incidents when they are not registered in the system. Accidents can hardly be hidden from view, so they will be reported. Registration of deviations is done in all areas of aviation: in an airplane information is stored in system like the FDR and the CVR, in the environment of air traffic control information from the communication and radar is stored in tapes and kept in a safe place. These systems are used after an accident or incident, together with other information, to find the causes of accidents and incidents. The interviews have shown that front line operators report those incidents, that are being stored in the system, thereby confirming what Tamuz has found (Tamuz, 1987).

The blame culture is seen in Dutch aviation legislation with the start of legislation in 1937: the Aviation Disaster Act held disciplinary measures that could be taken by the Accident Investigation Board against crew members e.g. to reprimand or withdraw a license for a certain period, although the board also held the power to come with recommendations. In

43 accidents in the period between 1958 and 1992 punishments were given by the Board in 100 accidents, while at the same time 68 recommendations were given in 36 accidents. Although legislation (national as well as international) did not hold a prohibition to perform judicial investigations, they hardly have led to the punishment of crew members in the Netherlands.

When a change of law was introduced, Schnitker stated (Schnitker, 1988) that the Penal Code was too broad to be used and the Penal Code was not suitable to take over the vacuum of disciplinary punishment, which was about to be deleted from legislation. From 1993 on new legislation was applicable in the Netherlands where the Accident Investigation Boards performed their job in a non-punitive environment. Until then the board acted as a court that published accident reports as verdicts which, until the end of 1991, held information about the crew member(s) involved. Until the precautionary culture came above the horizon, which can be set after the crash of the El Al Boeing 747 in 1992, punishment was not a leading issue to prevent accidents. After that crash punishment came back in aviation.

Paragraph 6.2: analysis of the interviews

When referring to groups in this part of the analysis, group 1 relates to the pilots and controllers with experience in accident and/or incidents followed by a judicial investigation and group 2 relates to pilots and controllers without that experience. Group 3 is related to the students. Other groups are referred to by their group indication i.e. lawyers or judges.

In this part of the analysis the information is organized according to the themes that came from the answers of interviews and questionnaires in order to have a view of several parties organized around this theme.

Paragraph 6.2.1 Knowledge about legal position

When analyzing the interviews of those front line operators who have experienced an accident or incident after which also a judicial investigation started, it can be stated that the majority had no knowledge about their legal position and although they will have heard the recognizance they do not know what it implies. This holds the risk of self-incrimination. Police stated that information is given at the start of an investigation about the legal position and that the recognizance is given. When an event is started from the point of inspection, a witness has to cooperate but not give a statement. The prosecutor said that the position of a person in the process should be clear from the beginning. Knowledge of the own legal position is important as self-incrimination is easily done and statements in this direction will not be deleted from the reports in a judicial investigation.

Lawyers, seeing aviation as a very regulated activity, confirmed that people do not know what their legal position is and suggested that, once confronted with an accident or serious incident that involved the judicial authorities, advice should be sought from lawyers. Both police and prosecutor confirmed that in general aviation people talk easier to the police than in commercial aviation and that lawyers are only by exception consulted before pilots

talk with the police. Also in group 2 interviewees stated that they would be hesitant to answer questions from the judicial authorities or would think (at least for a night) before talking to them.

This becomes more important when only one interview is held with the front line operator and the interview information, taking by the police, is shared with the Accident Investigation Board. That interview becomes leading in the investigation. The information from that interview is then used to compile a draft report about the accident or incident by the Accident Investigation Board and the possibilities to comment on this report should be used in conjunction with a lawyer.

Police and prosecutor do not see the draft report. The prosecutor stated that it is not desirable to use the final report in the judicial proceedings although it can and might be used as steering information during the investigation. The final report of the Accident Investigation Board is hardly ever changed (only one case was mentioned during this thesis investigation) and more than once mentioned as incorrect. Where it is used in civil court cases (litigation) it might be adverse for the front line operator.

Paragraph 6.2.2 Prosecution

In 6 out of 18 cases the interviewees stated that there was a prosecution, based on the Penal Code as well as the Aviation Act, and in 9 out of the 18 cases the interviewee used a lawyer. One lawyer stated that the prosecutorial authorities use the more severe articles in the law to prosecute in the last couple of years. This seems to confirm the earlier statements in this thesis about the change towards a precautionary culture. The period between an accident or incident and the end of a prosecution can take up to 16 years. Examples from France indicate that even longer periods are possible (see chapter 7). Even when no prosecution follows a judicial investigation, people are not properly informed about the next actions of the prosecutor.

The opposing views that can be given about the Penal Code and the several investigations can be seen in the theses that were given by the speakers during a symposium in the Netherlands in 2002 (2002):

The public prosecutor: The Penal Code has a place in the settlement of an incident of accident. There is sufficient legal basis for that. In applying the judicial system the interests of aviation safety is taken into account as well as prevention and effectiveness of enforcement (p. 23).

The professor in law: The penal system is not an adequate solution to assess mistakes of professionals (like pilots and air traffic controllers) and to prevent repetition of these mistakes. The penal system must – as far as safety incidents is concerned- be reserved for events that have shaken the legal order (p. 31)

The chairman of the board of an ANSP: Applying the penal code after safety invents, without any previous conditions, frustrates the obligation, concluded in international regulations, for an active safety management system and has therefore a negative influence for the improvement of safety.

The countries that form ICAO have, after deliberations, come to the conclusion that the importance of safety investigations is of more concern than judicial proceedings and a verdict. In the Netherlands but also in other countries there is no prevalence of investigations set in the applicable legislation. Prosecutions in aviation have become a national issue as States could not agree on this subject. Related to this is the fact that States have a national obligation towards society to prosecute after an accident or (severe) incident.

Information from police and prosecutor makes clear that an average of 10,75 cases per year are transferred from the police to the prosecutor. An average of 10 cases per year are paid after a proposal has been made by the prosecutor and only 0.75 case/year go to court. This comes from a total of 100 to 150 investigated events per year. Decisions to continue an investigation and/or to prosecute and the information about this to the suspect (the front line operator) is given quicker in the last year than in the time before that.

It is stressed that society has requirements, that are set for the prosecutorial way of working. Decisions to prosecute or not are also based on the signals coming from society, which are (partially) based on the actual culture. The opinion that is seen in the Netherlands from time to time that the prosecutor has no right to investigate and prosecute is contrary to the indefeasible rights given by the legislator to the judicial authorities. Prosecution, when done, should (according to several interviewees) be based on an own investigation and should not be borrowed or lent from other investigating agencies. The legislator (i.e. in this thesis one MP) stated that judicial investigations and prosecutions are part of society and equally necessary as a safety investigation.

The prosecutor stated that decisions to not-prosecute a person must be made on a solid basis, which itself requires an investigation. As others, involved in an accident or severe incident, have the right to appeal the prosecutor's decision to not-prosecute, the decision must be defensible. Where the investigation is not done correctly, the Court of Appeal can reverse the prosecutor's decision. This might lead, for aviation cases, to a prosecution where the prosecutor must prosecute *contre coeur* as has happened in prosecutions outside aviation already. Other interviewees saw more prosecution cases (not just in the Netherlands but worldwide) after safety related events. More information about this will be given in chapter 7.

The "Garantenstellung" might give an extra dimension in the decision to prosecute or not. It states that extra responsibility rests on the person who acts as a knowledgeable person: when a person is more professional, more trained and has more knowledge, he will be held accountable in judicial proceedings sooner than a person not holding these qualities. This leads to a situation that, when front line operators are more trained by their organizations to do their work to the best of their abilities, they are more susceptible to prosecution and convictions than others.

Lawyers stated that it would be better for aviation related prosecutions that a decision to prosecute is tested by a superior colleague. Where prosecution is done, this should best be done by the prosecution of persons who are responsible for the management of the organizations.

The judges were of the opinion that it is questionable whether police and prosecutor should act in cases of errors and minor mistakes, but were unanimous about wilful behaviour, gross negligence and carelessness as well as criminal acts like sabotage. Starting point ought to be that front line operators do not intend to make errors and that there might be technical or human fallibility without wilful intent. Learning from accidents and incidents should prevail over judicial investigations.

Also of importance is to realize that society has or might have an interest in prosecution when an accident or incident has a severe impact on society.

The severity of an event should be leading whether the operator has to be prosecuted and a threat to not report incidents was felt as unjust. One judge was of the opinion that more than 90% of the human acts are not caused by negligence and only a small percentage might lead to prosecution. More value was seen in safety investigations and prevention of future accidents.

The legislator, in this thesis represented only by one MP, was of the opinion that human error should not be prosecuted when it is part of the system, but could be held accountable when a person obviously violates the regulations. An investigation is needed to establish which of the two is applicable. Prevalence of investigation should be regulated along the lines that where the human has failed and this has led to an accident or (severe) incident the judicial investigation has priority and when the technique has failed the safety investigation has priority. Prosecutions should only be done in cases of intent. The goals of judicial investigations is to find the truth by immunity is not a solution as it may lead to unwanted behaviour.

The representative of the Civil Aviation Authority, being of the opinion that the prosecutor should behave restrictive, saw a possible throw-back in time and trust. Filtered and factual information given to the prosecutor might give the judicial authorities a better view of the present problems in aviation safety, as well as the way forward to improve system safety. This information should not lead to investigations and punishment, the last one not seen by the Authority as a proper intervention method.

The interviewees from media stated that a thorough investigation of the judicial authorities might be necessary to satisfy public demands and to apportion blame when this is evident.

Insurance companies are seldom interested in human error or violations after an accident or severe incident. They are there “to handle the wallet and the money”. Claims will be settled whenever possible. In cases where pilots behave in contradiction to the law and/or a prosecution is started, an insurance company cannot be held to compensate for the damages and there is a possibility to return to the original situation at the time of the accident and to require a refund from the policy holder after damages are settled.

Police investigations and prosecutions are in general seen as a threat to aviation safety: punishments add nothing to the facts.

Paragraph 6.2.3 Reactions in the environment

Persons in group 1 experienced that there were less reports or no reporting at all of incidents, but also that people had no idea of how the judicial system worked when they talked to colleagues: judicial proceedings are seen as counterproductive for aviation safety. This is in line with the majority of their own answers of not knowing what a person's position is in the legal system and their own position was.

Apart from the openness of front line operators, lawyers had the fear that organizations would be less open and more restrictive in giving information when there is a threat for prosecution.

Paragraph 6.2.4 Use of experts

In the period of the judicial investigation and prosecution experts can be helpful but are not always used. As aviation is complex in itself through the combination of issues like infrastructure, procedures, human limitations, environment, it is difficult to explain the ins-and-outs of an accident or incident to people outside aviation. The prosecutor and the judges, who often have to assess the case based on the paperwork that was delivered to them by the Aviation Police, are usually not (former or active) pilots or air traffic controllers and therefore mainly have knowledge about legislation. Their assessments, and in the end the verdict of a case, comes from this paperwork and the information they gather in the preparation of the court case.

Looking at the outcome of the prosecution several interviewees stated that it had a carry-over effect for future ways of handling cases: being more careful either in the direct work or in reporting incidents. There was no answer indicating that there was a feeling that justice was done to them. The time between the accident or incident and the (end of the) prosecution was seen as too long. It was sometimes difficult for people to continue with their life as they wanted to be ready for the prosecution.

The prosecutor stated that he doubted that people would report less, coming from information given by the aviation sector to him, as there was no data available to support this information about the issue of less reporting in relation to prosecution.

Paragraph 6.2.5 To report or not

In group 2 the interviewees stated that not all incidents were reported in general aviation and ballooning as these are two groups in aviation where reporting is hardly done. When incidents are reported, this was done in general because the incident was very obvious or registered in aircraft or ATC systems and would be found or the incident was seen as an unsafe act.

The fact that aircraft or ATC systems register deviations and can be found as an incident can be related to the work of Tamuz (Tamuz, 1987) who concluded after research that "with the installation of computerized surveillance the number of reports collected about easily measured air traffic violations increased dramatically, but pilots also substantially

increased the number of reports they filed about potentially dangerous situations which the new computer system could not detect”(p. 76).

An important reason to not report is the fact that there is no feedback to the reporter after the incident has been reported and that no improvements were seen after the incident was reported. It was mentioned in interviews with persons from different organizations that the capacity in the own organization to perform the investigation was insufficient.

Personal reasons to not report incidents in group 2 ranged from “not registered in FDM” or “nothing to be learned” via “a lot of paperwork” to “fear for prosecution after having seen a judicial investigation or a prosecution from a colleague after an incident”. Reason stated for others held several different items, among which were “negative for reputation” and “macho culture” via “fear for prosecution or reprimands” to “there is no use as nothing changes”. The fear for prosecution was often not reported as the first but as a third or fourth item why others would not report an incident.

Cases like the Delta case, still standing as a landmark in the Netherlands, and the mentioned tail strike were reasons for people not to report an incident. In the world of balloon flights there is hardly an incident that is reported.

In group 2 people were of the opinion that the decades of open culture and talking about incidents has become fragile. Judicial proceedings are not seen as the correct method to force people to “correct behaviour”, even in cases of optimizing violations which might be done within the discretionary circle that people have when doing their work, based on terms like “good controllership” or “up to captain’s decision”. It is not the prosecution but the threat of a judicial investigation that withholds people from reporting incidents: judicial interference, as stated by an interviewee, has led to less reporting of incidents, especially those that are related to the own errors. As De Roos stated: “Penal Code ultimum remedium. Not suited to assess errors”. The aviation world of today knows many actors with different responsibilities and has become a complex socio-technical environment.

Judges see no use in forced reporting as trust is needed to safely report incidents. Wilfully not reporting incidents can also be seen as a suspect behaviour leading to ideas that incidents have to be hidden from daylight. Cautious behaviour is required from police and prosecutors in those reported incidents where the reporter might incriminate himself; the principle of *nemo tenetur* should be realized. The general opinion of former members of the AIB is that reporting is important to come to prevention in the future after investigations.

The interviewees from the media stated that not-reporting was seen as a wrong signal to society. Not reporting should be circumvented by having the technique work for you: there is so much technique in aviation that the logged information can be used to extract information and this should be known to front line operators. One of the interviewees of the former Accident Investigation Board also stated this, adding that probably by 2020 more and more information can be extracted from the technical systems. This will lead to more stored information about accidents and incidents, but the front line operator (even

when informed and acting according to the findings of Tamuz) has to be interviewed about his or her decision makings in the events.

Paragraph 6.2.5.1 Reasons for not reporting

As stated earlier there were reasons for people not to report incidents. Across all interviews people were asked for reasons in general to not report incidents. Apart from the information that is presented above, the following reasons were given:

- absence of trust
- “it is not my task to report”
- no knowledge of the potential effects of an incident and incident seen as insignificant
- people do not know what is mandatory to report
- shame about the accident or incident
- reputation and fear for present or future position
- “it won’t happen to me” and loss of face

The most stated reason for not reporting in all interviews was the fear for repercussions especially for a judicial investigation and prosecution.

In several works in scientific literature reasons are found for not reporting and disclosing incidents (or adverse events, depending on the specific area people are working in). The following factors have been found against honest disclosure (remark: the wording might be slightly different from aviation as most applies to the medical world):

- (Liang, 2004) “shame and blame” mechanisms are antithetical to and ineffective in reducing human error (p. 63);
- (Liang, 2004): the culture does not recognize the reality that errors do occur (p. 64 & p. 74);
- (Liang, 2004): there has been little or no educational attention in the professional fields regarding systems, teamwork and patients and members of the error reduction community (p. 64 & p. 74);
- (Liang, 2004): disclosure might lead to tort cases and the legal system had disincentives (p. 65 ff)
- (Bayley, 2004): “shame and blame” are not helpful (p. 101);
- (Sage, 2004): a malpractice suit alleging serious divergence from prevailing standards strike most physicians as terribly disruptive (p. 164);
- (Sage, 2004): legal discovery and disclosure, with attendant reputational risk, discourages voluntary reporting of ‘near misses’(p.173).

Paragraph 6.2.6 Last resorts to exchange information

What is left to exchange experience and talk about incidents is what is known in aviation as “hangar talk”: informal moments where information is exchanged but this does not by definition have to be about the in-depth system problems as these cannot be found without an investigation. One interviewee in group 1 however stated that there can be more information found during informal meetings than can be found in formal incident reporting systems.

The culture of an organization is here of utmost importance and it is interesting to see that other safety related work (like the medical world and the world of a ships-pilot) is confronted with similar problems, sometimes even without the threat of a judicial investigation. In the medical world, the authority is up to now hardly investigating what is done after people have died in hospitals, but the public discussion in the Netherlands at present indicates changes for the future (Inspectie Gezondheidszorg, 2009): an action plan titled “Prevent harm, work safe” has started in 2008 with the goal to have a reduction of 50% of the cases of preventable harm and casualties.

Paragraph 6.2.7 Comments on reports

In half the cases interviewees of group 1 had the opportunity to comment on the draft report of the Accident Investigation Board, but only one report was overturned from a version 1.0 to version 2.0, based on important findings of others than the Board. In one other case the investigation stopped where it became important, according to the interviewee, to come to good recommendations for improvement and information to the aviation world. Not all comments were used to improve the draft report: in four cases the report was amended, the previous one with a version 2.0 being one of the four. Former Board members saw the comments as a serious opportunity to improve the report and the recommendations, and where necessary a report should be re-opened.

Paragraph 6.2.8 Withholding safety information

In all cases there was no safety related information withheld from the investigation during the interviews that were given with the investigators, either from the Board or the police. Information that came from other persons involved in the accident or incident was not used. Competence of the investigators, regardless of the organization they worked for, was seen as important to have the work done properly.

Paragraph 6.2.9 Use of final AIB reports

There is fear among several interviewed groups that the results of the Accident Investigation Board are used in the judicial proceedings. The final reports are public and can be read by anyone who has an interest in the accident or incident. Some expressed the fear that it could be used to steer the investigation. The prosecutor has indicated that the final report is used as steering information for the judicial investigation. The implication of this is that, although several forms of information in an AIB investigation is protected, the information can still be used although the judicial authorities have to make a U-turn to use it. Lawyers were of the opinion that the final reports should not be used as evidence.

The question whether the judicial authorities should come with a final and definitive result whether any prosecution will start before the release of the final report of the Accident Investigation Board received a positive answer from several but not all interviewees in group 1. In one case (abroad) this was done and had helped the pilot in come at ease with the case for that country. In several other groups the opinion was that the prosecutor should come quickly to a statement whether the case would be prosecuted or not.

Judges see the final reports of an Accident Investigation Board as expert reports. There should be no prohibition to use them in court as anything that could inform judges ought to be used. An area of interest for judges becomes the possible self-incrimination after the mandatory cooperation with safety investigations.

The former Board members held a mixed opinion about the use of the final reports: the use cannot be prevented as it is an open and public report, which will lead to the use as steering information by the prosecutor or in other proceedings, but a ban might also damage the defendants when exculpatory information is stated in a final report.

Insurance companies do not wait for the final reports of Accident Investigation Boards or judicial authorities with settling claims.

Paragraph 6.2.10 Data protection

Aviation is filled with data: information is spread between parties all the time, varying from radio transmissions between a pilot and an air traffic controller to radar data, from system information of specified parameters recorded in an FDR to quick access recorders and streamed data in ACARS. Almost all of these data is stored somewhere in systems.

The representative of the Civil Aviation Authority held the opinion that data should be better protected and, attached to this, protect the reporter. While in accidents and serious incidents that are followed by an investigation of the Accident Investigation Board, the FDR and CVR are protected, lots of other information is not protected. To name a few: these same recorders when the Board does not perform an investigation, other data like ACARS data transmitted to the airline, radar data from air traffic control and the like.

After an accident or severe incident, the Accident Investigation Board has the prevalence of investigation and access to recorders and other data. A Board can be seen as the custodian of this information, kept on behalf of society. It is used for the safety information but can just as well be used to prosecute. Question then becomes whether a Board should investigate slow or fast in relation to the acts of the prosecutor. The former members of the Board were of the opinion that the Board should use its own pace of investigation to come to the right analysis and the right conclusions.

Based on the Prosecutorial Code the prosecutor can require persons and organizations to hand-over the data to him or to the police. It is remarkable that 89% of the new generation (group 3) was of the opinion that FDR and CVR data might be used in a prosecution, while at the same time a minority stated that an accident should be followed by a prosecution.

Problems, seen to prevent improvements, were:

- there is no trust and this can only be achieved after a change in culture;
- there is no coherence in policy and legislation
- thinking and acting is too often based on short term gains;
- experience, knowledge and trust are pivotal for aviation, while changes in management are contra-productive to reach sufficient experience, knowledge and trust.

The framework of legislation should be made by subject experts and transposed in legislation leading to better legislation than the present legislation. The aviation sector itself has its responsibility and its interest to arrange those things that the legislator or the authority did not arrange through the systems of “Acceptable Means of Compliance”.

Paragraph 6.2.11 Does experience make a difference

Experience might change behaviour but not for everyone: the question whether the same case with the experience of a judicial investigation would be treated differently resulted in a split answer: 50% would handle the case differently and 50% not. The changes mainly came from the way they would treat the event towards authorities and they would be more careful with their answers. This is in line with the results from interviews with lawyers. Self-incrimination is one of the dangers that is just around the corner when one starts to talk.

After the event (whether there was a conviction or not) 5 interviewees of group 1 stated that less information was shared, five stated that there was no change and eight had no information on this subject. Information from two airlines in the Netherlands indicates that there is no change in the number of reported incidents; information from air traffic control related to the Delta case indicates a dip. In these cases no information is known about the severity of the incidents that are reported: the reported incidents might be less severe than other incidents that happen and are not reported for reasons only known to the persons involved in the incidents.

Although no specific information is sought about the reasons for the difference between airlines and air traffic control, a careful first answer might be that controllers meet each other on a regular basis and information about judicial investigation is spread quicker in the ATC environment than in a pilot community where pilots fly together between one and five days and then not for (sometimes a very long) period. This is also seen in group 2 when the question was raised about incidents from colleagues: more incidents are known.

Paragraph 6.2.12 Disciplinary proceedings

As far as disciplinary proceedings are concerned, the opinions between the interviewees in group 1 are divided. A minority of 16,6% of the people who have experienced the judicial investigation said “yes” when asked whether disciplinary proceedings would be acceptable in aviation. Split between a “no”, “no opinion” or “perhaps” and each good for 27,8% in this same group one cannot state that it is acceptable.

The question marks are seen in the problems and challenges with motivation ranging from “it is still a form of punishment” to “it depends on the acceptance of a board by the sector” and “there are more parties that add to an accident or incident than one”. There also was a fear for double punishment, one from the judicial system and one from a disciplinary system. On the positive side it was stated that a disciplinary board is seen as more competent as it is coming from the aviation sector when it is filled with people from different domains in aviation.

In group 2 people did not see disciplinary proceedings as an improvement of safety as a board has to be competent on the broad field of aviation and that these proceedings could be seen as a “closed shop” with people helping each other with covering errors and mistakes. One point of advantage was mentioned i.e. that the outcome could be more acceptable than from a judicial court. The Delta case was mentioned as one where the verdict was seen as incorrect.

The Aviation Police saw disciplinary proceedings not as a solution but as an old boys network; the prosecutor had no preference to re-introduce the disciplinary proceedings or to keep it deleted. Lawyers saw this system as a second punitive system, which might become useful when less prosecutions will be done, based on a balanced agreement between parties. Procedural safeguards can make these proceedings open and people will be less stigmatized than after a judicial proceeding. One judge was of the opinion that these proceedings were of no use in aviation where the other judge stated that it should be clear where judicial and disciplinary proceedings would start and end. The opinion of the Civil Aviation Authority was that disciplinary proceedings are as destructive as prosecutions are for safety and all achievements should around aviation safety improvement.

As there is no disciplinary punishment in aviation, as there was in the past, it was predictable for several interviewees that the prosecutor would fill this gap.

In cases of wilful misconduct the judicial system was still seen as the best solution.

Paragraph 6.2.13 The final verdict comes from the judge

The legislator has given judges the authority to come with a final verdict on cases: it is ultimately the judge who decides even in cases where the legislator is not very clear on the intention of legislation. Judges are trained to find information, broadening their knowledge when dealing with cases, but have no specific knowledge about aviation safety and (international) aviation regulations.

A judge has the authority to use the verdict and thereby interpreting the legislation to come to improvements, as was done in the past in cases of euthanasia in the Netherlands. The legislator (i.e. in this thesis one MP) stated that the legislator is not always able to make up legislation “up to 6 decimals behind the comma” and that the judges are there to decide the discrepancies in legislation. With this same authority the judge can regulate the penalty or not give a penalty at all, taking into account personal circumstances of those standing in trial. Goals of punishments are norm confirmation, reprisal and (special and general) prevention. Judges want to know which other sanctions have been taken against people brought to trial.

National jurisprudence has power of law, but jurisprudence from other countries might only be of interest. Judges fill “the holes” in legislation left by the legislator.

As for the acceptance of international regulations, the judges had slightly different opinions: one stated that international and national regulations should not contradict with each other, and the other stated that not everything can or should be accepted integrally.

The Authority was of the opinion that international regulations should be transposed to national regulations, leading to clarity for everybody in the international aviation world.

Paragraph 6.2.14 The media

It is the task of the media to inform society as objectively as possible, and disturbances in safety and especially disasters can lead to unrest in society, when information becomes of utmost importance. Society wants to be informed about accidents and disasters (whether from aviation or from other forms of transport) and specifically about the backgrounds and causes. Citizens are curious and become more curious where it might affect their own life. One journalist was of the opinion that the public in general has become more interested in safety after the turn of the century.

Reporting can however not be done in isolation so information has to be presented in context. To have the context, organisations are approached to comment, but contextual information is not always received.

Reporting might lead to an own investigation (although investigative journalism is not done on a wide scale in the Netherlands) to inform the public. Investigations have to be performed, according to the interviewees, by an Accident Investigation Board as well as the own organization and the judicial authorities, as each has an own responsibility towards society. Victims and next of kin have the right to be informed and judicial investigations can be used to do just that, apart from the question of blame that society wants to have answered: even when there is nobody to blame, a thorough judicial investigation is needed.

Judges should have access to all information during a prosecution, including reports from the Accident Investigation Board, as was the opinion of one interviewee.

Paragraph 6.2.15 A new generation ... another culture

As stated earlier in this thesis culture in society is changing from a risk culture to a precautionary culture. Starting in 1992 in the environmental regulations and spreading out to complex technology, it has found a way in society which might make it visible in a younger generation: the people who are at present working to gain their ATPL and who usually are around 20 to 24 years of age. This was the background of sending out a questionnaire to students of two flight schools where the average age of the 35 respondents was 22,4 years.

Mandatory reporting was seen by this group as necessary in order to prevent future accidents and incidents and to improve safety, seen as the most important in aviation. Investigations after an accident or incident have to be performed by an Accident Investigation Board (94%) or the own organisation (89%) but only 49% were of the opinion that a judicial investigation should be started.

80% of the students were of the opinion that the safety and judicial investigations should not be combined. Risks in judicial investigations were stated as a less open culture in relation to learning and fear for punishment, when there is always someone who can be

blamed for the incident. All in all, these combined reasons accounted for 80% of the answers.

Allowed evidence in court cases was, according to this group, the information coming from the FDR and CVR (89%) and the final report of an Accident Investigation Board (77%). This is remarkable as both recorders and the final report are protected from use in any other proceeding than a safety investigation. Reasons for using or not using differed from “using gives a more honest opinion about what happened” to “it could be wrongly interpreted”. One suggestion was to have the Board decide which parts of the report might be used in a prosecution.

Judicial investigations and/or prosecution were seen as a necessity or wanted by all respondents for alcohol and drugs when flying. Asked about intentional violations there came a split between “necessary”(74%) and “wanted” (26%). After a fatal accident only 40% stated that a judicial investigation and/or prosecution as a necessity and 40% as wanted. When the severity of the accident was reduced to “accident with injuries” and “accident with material damager” the percentages reduced to 31%, 34%, 29%, and 34%.

Disciplinary proceedings were seen as useful for 86% of the respondents and competence was mentioned as motivation. The opinions were more spread in the question about punishment in relation to disciplinary proceedings: 60% for “yes”, and the rest was between “no” and “maybe”. A majority of 77% stated that people would experience disciplinary punishment different while knowledge and a more just treatment were mentioned as some of the reasons. Also stated in relation to this issue is that disciplinary proceedings also could lead to silence and that it could not be a substitute for a judicial process.

A minority of 40% stated that they wanted to learn from judicial interventions and publications. Most people wanted to learn from accidents and incidents through reports of an Accident Investigation Board or the own organization (80% and 83%).

Paragraph 6.2.16 Other safety worlds

From the comparison interviews the following items appear from the medical world:

- incidents with clinical medical trials (“adverse developments”) in the medical world must be reported to the medical authorities and this might lead to an investigation which can be done by one of several parties, the medical authorities being one of them;
- a mortality rate of more than 10% quarterly must be reported to the medical authorities;
- the majority of the medical incidents were reported and there is no fear for the medical authorities to take measures against persons;
- it is up to the medical authorities to report incidents and accidents to the prosecutor;
- complications and incidents were discussed with colleagues;
- when incidents are reported and investigated, the reports are presented in a phraseology that makes reality non-traceable for non-medical staff (this was related to the consequences of reporting of which one was mentioned as the fear for prosecution);

- changes have to come from within the medical world through a change in culture and from patients who must be more aware of risks;
- working according to protocols is important and deviations from protocols, leading to a stop in surgery, can help preventing incidents and accidents;
- disciplinary and judicial interventions were seen as having a negative effect on patient safety;
- the prosecutor was never seen, even when culpable second-degree manslaughter was seen by medical staff.

That improvements can be made is shown by Leistikow (Leistikow, 2009) where the board of a hospital declared patient safety as top priority leading to a rise in reports of incidents and a change in reporting culture. In another case a Court of Appeal stated that the persons reporting incidents should have no fear that measures will be taken against them and that societal significance of reporting is severely harmed when the report is made public.

From the ships pilots world, it was derived that there is duty to report incidents and accidents, using a certain forms. These forms have been claimed by the police, despite the fact that the forms were not meant for their investigation. The result was that less forms were filed and closed meetings were held by the ships pilots to learn from each other.

In one railroad accident a reduction in reported incidents was seen when the judicial authorities started an investigation and a prosecution against one train driver.

Paragraph 6.2.17 Competence of authorities

Remarks coming from the groups of interviewees in groups 1, 2, 3, 5 and 8 (controllers and pilots, students and lawyers as well as former members of the Accident Investigation Board) was that the judicial system, from Aviation Police through the prosecutors and judges, was not always seen as competent and that knowledge should be improved. For several interviewees the ways the police and prosecutor acted were reason to reduce reporting incidents while information that was shared between colleagues in the past had reduced. The result was less information. Lawyers were of the opinion that the prosecutor should seek advice of experts and not proceed on the basis of police reports.

Insufficient knowledge to perform an investigation was especially seen in the world of balloon flying and in the world of air traffic control.

A bizarre experience of incompetence came from an example where one interviewee had to make the questions concerning the incident for a police interview, fill the answers and was, in the end, sentenced by a court as he had incriminated himself, where he expected the interview with the police to be of value to improve safety. It also shows that people are not aware of their legal position when they have to deal with the judicial authorities.

The case of the tail strike shows that the judicial system is easier to use against persons than against organizations, which might come from the fact that lots of legislation is written in a way that it forbids a person to do one thing or another and the organizations hardly ever are seen in Penal Code and, although a bit more, not very much in Aviation Acts with

punishable articles. As for this last (organizations and an Aviation Act) it is remarked that organizations are mentioned but the rules are often stated in an administrative way and the rules for the person are written with a norm in it, easier to handle in judicial proceedings.

In other events people were confronted with a lack of knowledge of a particular field of aviation, biased and leading questions during an interview. In another interview a director of a flight school had to remind to police to give him his recognizance that he did not have to answer to the stated question. As stated by a judge: this is a reason to look different to the way the police and prosecutor have dealt with the investigation.

Chapter Seven: Other worlds

Paragraph 7.1 Introduction and examples

The Netherlands is not the only country which has prosecution after an accident or incident. In Europe we have seen the start of a police investigation and/or a prosecution after accidents in France, Italy, Greece and Switzerland. Outside Europe this has been seen in countries like the United States and Indonesia (Air Safety Week, 2009). In Italy and France the judicial authorities have interfered with the safety investigations of the Air Accident Investigation Offices and the judicial authorities have seized evidence and not shared it with the Air Accident Investigation Offices (Flight Safety Foundation, 2009). These actions hamper the progress of safety.

Examples of prosecution of front line operators, as can be seen from information in publications, are:

- after a crash (Comair 5191, Lexington, August 27, 2006) in the United States, a court ordered the airline to hand over occurrence reports (provided to the airline by its' pilots in order to improve safety) to the lawyers of claimants, which lost relatives (IFALPA, 2008);
- an air traffic controller was convicted in Japan after a near miss in Japanese airspace between two aircraft, which led to imprisonment with a suspended sentence (Mainichi Daily News, 2008);
- the crash of the Concorde in Paris (2000) has led French prosecutors to charge five people and Continental Airlines with charges of voluntary manslaughter, and among these five there were three engineers who designed and certified the supersonic plane more than 30 years earlier. Continental and two of its employees are included because a piece of metal that crash investigators believe fell from one of its planes is suspected of initiating the crash (Michaels, 2008);
- after the crash of an Airbus of Air Inter in northern France in 1993, several people were brought to criminal prosecution, among them the man for not purchasing the ground proximity warning system for the Airbus fleet (Dekker, 2002b);
- and after the most serious crash of 2008 with a Spanair MD82 on August 20th two maintenance engineers and their supervisor have been charged with manslaughter by the Spanish judge who heads the judicial investigation (Turner, 2008);
- in Switzerland air traffic controllers are being prosecuted for being involved in a runway incursion (at Geneva airport in 2008) and after a crash of a VFR flight into a mountain (in the environment of Geneva in 2007), which has led to a drop in incident reporting (Tessin, 2009).

Eurocontrol conducted a survey in 2001-2002 and reported in 2002 that there are significant legal constraints to non-punitive ATM safety occurrence reporting in many European States and that many staff feel inhibited to report (Eurocontrol, 2002). Prosecutions as mentioned in the cases above give not only front line operators but also people working in maintenance, design and purchase of equipment the feeling that they can be prosecuted, even after a long period as in the case of the Concorde crash, when they were performing their normal line of work as seen within a local rationality. Will the next

step be the prosecution of the aviation authorities for the approval of the design of an aircraft or the acceptance of a procedure?

Paragraph 7.2 The growth in prosecution

Prosecution of front line operators is growing over time. The crash with ValuJet 592 appears in hindsight to be more or less a starting point of more prosecution in aviation related cases. Thomas described this case (Thomas, 2002) in brief from the view of the United States National Transportation Safety Board and from the view of the prosecutor. The first organization stated that "The ValuJet accident resulted from failures all up and down the line—from federal regulators to airline executives in the boardroom to workers on the shop room floor . . . There are a million 'what ifs,' where you could say 'but for this having occurred or not occurred, this never would have happened.' Is it really fair to single out one possible link in the chain?". The latter organization stated that "This crash was completely preventable. This was not an accident, this was a crime. It was a homicide,". And although those who were brought to trial were acquitted of all charges, this case showed to be a turning point in the prosecution of aviation accidents for the international audience. Billings (in (National Patient Safety Foundation, 1998) p.57) stated earlier that there was an increasing trend in prosecuting people criminally as well as in civil liability, for "offences committed in the course of their employment in this industry".

The crash of a Tuninter ATR in the Mediterranean Sea near Sicily in August 2005, where the aircraft ditched in the sea after running out of fuel, lead to a prison sentence for the pilot and the co-pilot: they were sent to prison for a period of ten years after having been found negligent, although they could not have known they had not sufficient fuel on board to complete the flight safe. Previous to the flight a wrong fuel indicator (i.e. for an ATR42) was installed in this aircraft (i.e. an ATR72) and this wrong indicator gave the pilots wrong information i.e. the information that sufficient fuel was available to perform and finish the flight in a safe way. After the engines stopped, they tried to perform an emergency landing on a runway at the airport of Palermo, but they did not make the runway (nu.nl, 2009).

National and international regulations have been established about the investigations to the causes of accidents and severe incidents in aviation. These regulations often address the organization that has to investigate and the purpose of this investigation. ICAO has regulated these investigations in Annex 13, where JAR-OPS has regulated this for airlines in Europe and EU-directives have regulated this for air traffic control organizations.

Paragraph 7.3 The concurrence of investigations

What has not been arranged in these regulations is the concurrence of these investigations with investigations that are or might be performed by the police and the prosecutor. The goals of these investigations are different. Where the safety investigation is directed towards the system and the points of improvement in the system (and system consisting of human, machine and procedures) in order to come to a better system, the judicial investigations of police and prosecutor are directed towards a person who did not comply to the regulations and might therefore be brought to court.

The starting point, after an accident or an incident, is that there is always somebody who is involved. Not complying to the regulations can be seen when the way a human handled a situation to come to a certain outcome is attached to articles in the law. It is like counting the error the human has made: the more errors and the worse the outcome is, the harsher the verdict can be about the way a human has been working. A brief explanation how this could have happened is not to be used as an exculpatory message, but is used as reduction in the sentence.

The Delta case and the tail strike can be seen as examples of this: all that is being done in these cases is to describe a situation in legal terms by a prosecutor in front of a Court of Justice or a Court of Appeal with the strict use of the legislation that is applicable according to the prosecutor. Reports of a safety investigation proving the system being the start of the errors and statements of expert witnesses who explain how and why these events could have happened, only play a part in the verdict: in the Delta case the three defendants were found guilty without punishment and in the tail strike the Court of Appeal gave a same verdict but the case is under appeal at the Supreme Court.

It is another way of counting errors. This is the Bad Apple theory where the human that failed to act in the correct way (correct being the way not leading to the outcome which outcome was established after the fact) is the weak component that worked in a safe system.

Paragraph 7.4 The goals of the judicial system and safety investigations

The goals of the judicial system is to punish people in order to

- 1) confirm the norms towards society;
- 2) prevention in a general and a special way;
- 3) retaliation.

Punishing turns the human who acted into the human at fault with the system, despite his efforts to come to the best outcome, and will lead to a culture where people will do their utmost to not get caught after an act. There will be no learning or, as Dekker stated, “there is no progress on safety in the old view of human error” (Dekker, 2003).

Safety investigations ought to be done from the point of view of the human who acted: why did he act in a certain way, based on a local rationality. The human that is involved in an accident or incident is accountable in the system. He or she has to tell the story how the situation unravelled for him or her and how he or she acted, which decisions were made and why these decisions were made, if at all possible to give all this information to the investigators. The information in turn is used to come to a complete view of the events and where necessary make the proper recommendations. These recommendations are to be used by the addressee of the recommendations to come to improvements. This way of working puts the human at the centre of the investigation and uses the human as an important point of information, not seeing him or her as the culprit but as an important asset in the investigation.

Paragraph 7.5 Errors, hindsight and more about judicial investigations

The errors that are made by the human are seen as part of the environment in which the human is working, related to the tools and tasks, where the decisions and actions made sense at the time. The human did not cause the incident or accident, but made decisions in order to prevent an incident or accident and these decisions made sense at the time. It is only in hindsight that other possibilities are seen. As hindsight does not change the reality of what has happened and will never change history, hindsight is hardly of use and often harms people.

One other main difference between a judicial and a safety investigation is that the judicial investigation has the possibility to stop when it is found that the elements of the articles in a law have been fulfilled. If safety investigations were done in this way, improvements could not be made and there would be no difference with the judicial investigation. Dekker stated that when to trace “the cause” of failure, the causal network would fan out immediately like cracks in the window, with only the investigator determining when to stop looking (Dekker, 2003). The judicial investigator can stop earlier than the safety investigator, who has to continue in order to explain what happened and why it happened.

A last difference between the two investigations I should like to give is the fact that the outcome is used to assess the situation. An airplane on final and heading towards the runway is thought to make a landing. When the pilots do so and the landing is successful, hardly anyone looks for the circumstances why the landing was successful. When things go wrong and the aircraft runs off the runway, we might have the same crew and the same circumstances. But where in one case the human is the leader towards success, this same human can be seen as the leader towards disaster and tragedy and should be punished. The judicial system is never looking for the successes, only for the “bad outcomes”.

But people in complex systems like aviation make more successes than tragedies, because they are trained, use standard procedures, use checklists and memory aids, but also experience of colleagues and information that comes from accidents and incidents in the past. The prosecutor and judges sees this in a different way: people who are professionally trained have a greater “duty of care” also known as the “Garantenstellung”: it leads to a situation where they, despite the better or more training, are more vulnerable to the label of “gross negligence” that is being used in prosecution.

Paragraph 7.6 Just Culture

When no punishment is given for the actions that have been done, one could state that a kind of Just Culture can be seen. Just Culture is a phenomenon that circulates within aviation for some years and several definitions and descriptions exist¹¹.

¹¹ There are several descriptions and definitions of Just Culture. Reason described Just Culture as follows: ” The components of a Just Culture include: just, reporting, learning, informed and flexible cultures. A Just Culture is then an atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour” (Reason,

The question what it is that makes a just culture “just” is asking for the properties of just. And how will one recognize just in a culture? As we are talking about safety industry, to make things worse I want to put the word “just” within this context.

How will one recognize just in a culture? It can only be derived from the way people want to talk about incidents. Dekker ((Dekker, 2007) p.24) states: A just culture also pays attention to safety, so that people feel comfortable to:

- bring out information about what should be improved
- allow the organization to invest in resources in improvements.

Is there a connection between “just” and “justice”? Well, apart from the first four letters in “justice”, there is more. Every person has a sense of what is right and what is wrong, a sense of justice: Jeder Mensch hat ein Gefühl von Gerechtigkeit.

What we expect from “justice” is that it is fair in the way it treats people. That, apart from what is written in law and regulations, it is clear that people only get prosecuted when it is objectively obvious that those things that they have done, are wrong. People should not be prosecuted for administrative nuisances. Isn’t this why Lady Justice has a blindfold?

So “just” as in “just safety culture”, meant to be the right attitude and approach to safety, is closely related to “justice” when it means to prosecute only those who objectively have done something wrong. And that excludes prosecuting people who are doing their normal work and make an error.

Vlasek stated (Vlasek, 2009) in his introduction that front line operators argued during his interviews that a Just Culture for them is a way to “do whatever we want without punishment”, in other words they thought that they only had rights and no duties inside a Just Culture. A Just Culture is also the responsibility of the operator to report and fully disclose any mishap (pp. 5-6).

The investigation of Vlasek showed that 96% of his interviewees stated that a Just Culture is important to improve aviation safety and 4% stated that this is important. The question whether a reporting culture is important for aviation safety was answered with “very important” by 92% of his interviewees.

1997). Eurocontrol has two definitions, the first one from 2005: ” An atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour. The “just culture” finds its limits when gross negligence, criminal activity or intent on the part of reporter is established. In all other cases the reporter should not be subjected to administrative or disciplinary sanction simply on the basis of the report submitted.” (Eurocontrol, 2005). The second one is from 2008: ” A culture in which front line operators or others are not punished for actions, omissions and decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated” (Eurocontrol, 2008). Others have written about Just Culture without giving a clear definition (Dekker, 2007), (Dekker, 2008). ICAO has not yet come with a definition (ICAO, 2008).

Vlasek concluded that “Organizational learning has to grow like a small plant. ... One part of this cultivation process is and will be for sure Just Culture.”

Disclosure and open reporting combined with a blame-free law system is the only way in which we can improve system safety. Ferner and McDowell investigated medical incidents that ended up in court and showed that in the period between 1795 and 2005 only 177 health professionals were charged with manslaughter. Since 1975 44 doctors have been charged of whom 30 (68%) were acquitted and 14 pleaded guilty to or were convicted of manslaughter. This longitudinal study over a period of centuries shows that despite punishments, there always will adverse events, even when people are convicted in court (Ferner & McDowell, 2006).

Paragraph 7.7 The human in the system

The position of the human, involved in an incident or accident, is often diffuse at the start of an investigation. The great advantage of a safety investigation, as described above, is that the safety investigator does not have to look towards the human as the culprit, but has and can see him as an asset to the investigation. There is no necessity to give the human recognizance as the police has to give towards the same person that might be the suspect in a judicial investigation, that he or she does not have to give an answer. This right of the suspect in a judicial system must be given before a statement is taken from a suspect.

But when this same person is treated as a witness, as stated in the interview with the Aviation Police, he or she is obliged to cooperate with the investigation. As can be concluded from the interviews of those involved in accidents and incidents and confronted with a judicial investigation, they almost all felt that they could freely speak, give their statement and did not know or hardly knew what their position was. Lawyers have confirmed that this leads to problems. Speaking freely about what has happened and giving all the information that is needed for a court case is one of the dangers not seen by those involved in an accident or incident, and self-incrimination happens. In one interview the interviewee stated that he had to raise the questions the police could ask him, answering them thereafter, as he thought that he could freely do so thinking that this was used to improve safety. In the end, it led to his own court case.

Is this the clash of two Titans, one being the prosecutor who acts on behalf of the general public and states or assumes that by prosecuting pilots and air traffic controllers the aviation world will become more safe, and the other being the Accident Investigation Board or an organization who performs the safety investigations to improve safety of aviation on a broad scale, sometimes even with world-wide impact?

Sparaco stated that where the accident investigators revealed lapses and errors that occurred before the take-off of the Tuninter ATR 72, the judges opted for holding the chain of command accountable for the accident, after having seen in a flight simulator and reproducing the flight path and asserting that a landing on the nearest runway was possible. Sparaco called for rapid action by ICAO and EASA to stop prosecutorial interference (Sparaco, 2009).

Paragraph 7.8 Culture and conflict

Marsella views these things from the perspective of culture and conflict (Marsella, 2005). And although his article is for a greater part about cultural differences on a global scale, it can be brought back to a local or national scale as well. To paraphrase Marsella: “it is clear that differences, when codified and embedded in “unassailable” belief systems, such as those associated with different systems can provoke clashes by dogmatic religious beliefs”. Marsella states that we must recognize the power of culture in constructing our realities (p. 653). Marsella mentions several factors that are embedded in culturally constructed perceptions amongst which:

- perception of the “other” as dangerous, threatening;
- perception of the situation as unjust, unequal, unfair, humiliating and punishing;
- perception of self as self-righteous, moral, justified and “good” by virtue, history, identity.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Chapter Eight: discussion

That accidents and incidents will happen is a fact of life. That front line operators will commit error and mistakes is a fact of life. It is of importance to have safety work performed in such an environment, that people have trust in the organizations around them and report incidents. It is the information about incidents that can be seen as the blood stream to start with incident investigation, come to proper analysis about incidents and then improve the system. The number of incidents can then be reduced and the frequency and number of accidents might be delayed and reduced.

The culture of open reporting of incidents is not specific to aviation safety and is related to society as a whole but also to the regulations that are implemented in society. It is therefore that the European Civil Aviation Social Partners met with the European Commission Transport Commissioner's cabinet to talk about the need to establish the Just Culture principles. They have asked the Commissioner to liaise with the Justice Commissioner and start a dialogue at the highest political level about Just Culture (CANSO, 2009).

Paragraph 8.1: Foucault and rules

Have we ever seen someone behaving better because of judicial proceedings? The feeling might arise that there are two different worlds: one of prosecutors, lawyers and judges, a world of legal talk where the rules are the basis of doing work; and the world of people in everyday safety life, with decisions based on the fact that the best outcome must come from this best decision, sometimes to be taken with the snap of a finger.

Foucault (Foucault, 1975) states that in classical thinking about legislation an offence offends the rectitude of those who abide by the law and, even when no harm is done, it is an offence that demands reparation because the right of the superior man is violated and because it offends the dignity of his character. In this sense the ruler has the right over the offender and offences attack the sovereign. From that comes the right to punish, where "the prince sees that his law is respected by ordering the punishment of crime" (Foucault, 2008). Then, from the end of the 17th century, there is a reformation in criminal law and punishment which leads to the idea that the citizen is presumed to have accepted the laws of society, including the laws by which he might be punished (Foucault, 1975). From then on, the criminal is seen as the person who has broken the contract between himself and society thereby attacking society and penal punishment is a function of society. Foucault states that "in effect, the offence opposes the individual to the entire social body; in order to punish him, society has the right to oppose him in its entirety". The right to punish is established and the offender becomes the common enemy (p. 124 ff).

This is reflected in the answers that were given by the legal people, interviewed for this thesis: functions of punishment are to re-establish norms in society and come to prevention in a general way (towards the rest of society) and a special way (towards the offender), where prevention should work for a long time. As seen in the work of Lerner and McDowell (Ferner & McDowell, 2006) punishment in the medical world does not lead to less offences. It becomes very questionable whether the functions of punishment are of use in the world of aviation safety.

Foucault then questions whether a crime ought to be punished and answers that, "in order to be useful, punishment must have as its objective the consequences of the crime, that is to say, the series of disorders that it is capable of initiating (p. 129). In relation to the way safety cases are treated at present by prosecutors an important remark from Foucault is at its place: "One must calculate a penalty in terms not of the crime, but of its possible repetition. One must take into account not the past offence, but the future disorder. Things must be so arranged that the malefactor can have neither any desire to repeat his offence, nor any possibility of having imitators" (p.130). After Foucault concludes that the function of the penal apparatus is to reduce offences, he states that failure has to be omitted (p.377) and states that "penalty would then appear to be a way of handling illegalities, of laying down limits of tolerance, of giving free rein to some, of putting pressure on others, or excluding a particular section, of making another useful, of neutralizing certain individuals and of profiting from others. In short, penalty does not simply 'check illegalities'; it differentiates them, it provides them with a general 'economy'." (p.378).

But reduction of offences, as constructed in the world of legislation and enforced by police and prosecutors, can not be reached when errors and mistakes are committed by front line operators. Errors and mistakes are usually detected after the fact, when the outcome is known and the errors and mistakes are seen. A safety investigation will then try to establish the facts and possible mitigating procedures, but even safety investigations will not always lead to an incident or accident to never happen again. Example of this were found in the studied reports of the Accident Investigation Board (period 1958-2001) where accident like performing a VFR flight in IMC conditions were seen again, as well as spin and stall accidents. A specific example to be mentioned is the case of the airline mentioned in paragraph 4.5 that was involved in a runway incursion at a spot where 40 years before another crew had performed a similar manoeuvre. Where the captain of the flight was punished by the board in 1969, the same event could happen again not just once but several times. Safety investigations and improvements after the investigations have reduced the number of occurrences at this specific spot.

Foucault also states (Mills, 2003): "In 1820 it was already understood that the prisons, far from transforming criminals into honest citizens, serve only to manufacture new criminals and to drive existing criminals even deeper into criminality" (p. 40). This implicates that from 1820 on up to now, it is a known fact that "time in prison" does not make you a better person; this is confirmed when Foucault says (p. 48) that judges know that the instruments available to them, don't transform anyone. He further states on the same page that delinquents turned out to be useful in the economic as well as the political domain. It can be derived from these statements that punishing people for their behaviour is of no use for society.

Where Foucault talks about criminals being put in prison as society did not want these people, we in safety industry are talking about people doing normal work and erring, which in some cases can lead to punishment (not always imprisonment): it is for sure that in these cases any punishment, how light or severe it may be, will not work neither for the one that is on trial at that moment nor for others where the punishment should work as a deterrent.

Paragraph 8.1.1: judges, judicial procedures and safety

Will this help to convince the judiciary of the conclusions from the previous paragraph that any judicial procedure is counterproductive to safety? Jensma interviewed a judge at a Court of Justice in the Netherlands (Jensma, 2008), Mrs. Tineke Cleiren, and also professor in criminal law at the Leiden University. Some quotes from this article:

- a weakness in our system is that the judge may make choices himself out of the presented evidence and can leave evidence out of the case;
- one piece of evidence “with additional evidence” is enough;
- for its origin our system of proof is based on at least two items of evidence per part of a delict;
- it is not the task of the judge to decide what exactly happened. The task of the judge is limited: is there proof that the charges of the prosecutor have been committed. The judge does not perform his own investigation, contrary to the prosecutor and the police. Did happen what was in the charges? That is the basic question for the judge. He does not make a diagnosis like a doctor would.
- the judicial system knows very well that the real truth will not come out, but you are reconstructing what might have happened;
- as the prosecutor is more convinced of the guilt of the accused, he is even more obliged to also give relieving evidence.

This does not give much hope that judges and prosecutors will go for a different system to improve society. The system of working might look like a tick box: all elements of an article in a certain piece of legislation are fulfilled so the suspect can be convicted. And constructions of facts in a judicial system get a different interpretation than would be done in a safety system, where the explanation of what has happened and future prevention is of utmost importance, especially to those persons in society who travel by air. The better side of this is that the interviewed judges looked deeper than just the tick box and are willing to take exculpatory issues into account.

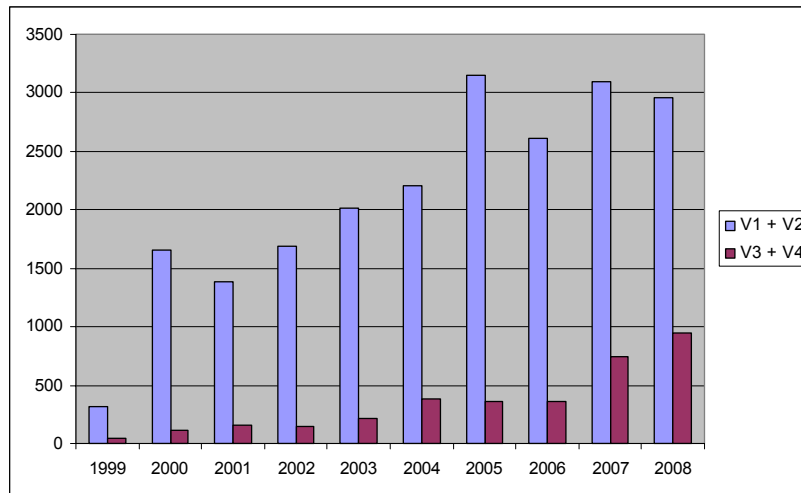
Paragraph 8.2: Investigations

Accidents and incidents can be investigated and seen at three different levels, as described by Van Duin (van Duin, 2001) and by Rosenthal (Rosenthal, 2001). Both see three levels of investigation leading from a loose bolt to problems in organisations and society:

- a micro level, where the investigation turns towards the direct causes, like the technical failure, the human operator that erred or bad luck;
- a meso level, where the organisation can be seen as weak or ineffective for the use of information and for communicating information towards those who are accountable for changes in the system, where organisations have a weak safety culture and might have ineffective mitigating procedures for accidents;
- a macro level, where the trade-off between several societal values can be found like safety, politics, legal aspects, and public and the media.

All three levels will be explained below.

A question is whether open reporting of incidents leads to a dip after judicial intervention and enforcement leading to a prosecution.



After the sentencing in the Delta case of the three involved controllers less incidents were reported as can be seen in the adjacent figure. The dip, visible in 2001, shows the decrease in reported incidents for the severe (V3 and V4) and less severe (V1 and V2) categories.

Two Dutch airliners have been involved in accidents, both leading to a judicial investigation and where one of the two cases has led to a prosecution and the other stopped after an investigation of a judge-of-instruction. Both airlines were asked whether a dip in their reported incidents were seen. Both airliners stated that there was no negative effect seen in the reporting of incidents after the accident nor after the prosecution started nor after the sentencing of the pilots involved (airline T, 2009) (airline K, 2009).

The figure below shows the result that one of the two airlines presented (airline T, 2009). The reduction of ASR's in 2003 could not be explained in relation to the start of a judicial investigation. The rise in reports, as was stated, was due to a campaign to improve reporting. This airline also stated that there might have been an effect, but that it is not visible in the figures.

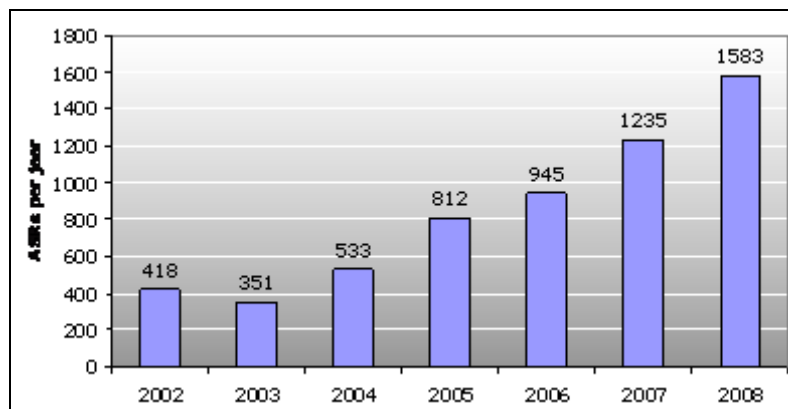


Figure 7: this figure shows the reporting of ASRs in an airline which also experienced an accident leading to a prosecution.

An explanation of the differences between the air traffic control community and the pilot community in reporting incidents has not been investigated in depth. It is a fact that controllers have more direct contact between each other during their shifts and that they see different colleagues during their shifts, where pilots start their work with one colleague and there are no changes during a shift. This might be a part of the explanation.

Paragraph 8.2.1: investigations at the micro level

Judicial investigation are directed towards the failures at micro level and punish where necessary. The front line operators can be prosecuted as they are easily identifiable and always have played a role in the accident or incident sequence. Reason mentions them as the persons who perform the active failures (Reason, 1997). The judicial investigations do not take into account whether another operator with a similar level of knowledge and experience might make the same mistakes leading to a possible same outcome (Reason mentions this as the substitution test (Reason, 1997)). As this is not done by the prosecutor and the police during an investigation, it rest on the shoulders of the operator and the lawyer to perform such an investigation and use this information in the defence of the operator. Judges might take this information into account in the verdict.

This has happened in the past and one example is the Delta case, the name of an incident at Schiphol Airport on December 10th 1998 where a Delta Airlines Boeing 767 had to abort the take-off when a Boeing 747 on tow crossed the same runway at that moment [for a broader description see (Ruitenberg, 2002)]. The court in this case took the circumstances and mentioned in the verdict (November 8th 2002) that the conditions under which the operators had to work in the tower in order to prevent incidents like in this case, were not optimal. The final verdict was that the controller/instructor, the controller under instruction and the assistant of these two, were guilty as charged (amongst which was performing air traffic control in a way that endangers aviation) but no punishment was given (Rechtbank Haarlem, 2002). Causality is coupled to the person and the articles in the legislation and not to the system itself.

Part of this micro level is the fact that citizens have become more familiar with ways to force the prosecutor to start a prosecution: in the Netherlands the applicable legislation has a procedure called “article 12 procedure” where the persons who have been harmed by a crime or an event can appeal the decision of the prosecutor when he decides not to prosecute, and a court then decides whether the reason for not-prosecuting are correct. When the court decides that the wrong decision has been made, the prosecutor is obliged to prosecute.

Because of these procedures, prosecutors will have to make a sound decision why not to prosecute and before this decision is made, a police investigation has to be performed. Interviewees have stated that most people do not know their legal position, which might make them susceptible for self-incrimination which in turn might lead to a bigger chance of prosecution.

It looks like we have started a spiral dive. In aviation terms: it looks like a flat spin and flat spins are difficult to correct. One needs lots of altitude above ground level to come out of a flat spin. We might need lots of time to come out of this spiral dive.

Paragraph 8.2.2: investigations at the meso level

Where communication is inadequate and organisations have a weak safety culture, one can think of the incubation of disaster as mentioned by Turner (Turner & Pidgeon, 1997). Turner was the first to demonstrate how technical, social, institutional and administrative arrangements, in combination, can systematically produce disaster. Man-made disasters not only had preconditions, but those preconditions had characteristics in common, one of these being a long incubation period. A disaster occurs because of some inaccuracy or inadequacy in the accepted norms or beliefs. This inaccuracy between the way the world is thought to operate and the way it really operates rarely develops instantaneously. With this 'incubation period' a chain of discrepant events, or several chains of discrepant events, develop and accumulate unnoticed.

Later scientists came with the name "drift into failure" (Columbia Accident Investigation Board, 2003) (Dekker, 2005), which can be seen in the same way as Turner's incubation period. Turner mentions that the incubation period can be somewhere between one month and 80 years.

Van Duin stated that research has shown that "the absence of obvious explanations at micro level have led to investigations at the level of organizations" and that a deeper investigation was not performed when specific individuals could be identified (van Duin, 2001). Deeper judicial investigation are often difficult and expensive and Penal Code is usually not addressed towards organisations: the articles in the Penal Code usually uses language that is directed towards persons. This is especially the case when casualties are seen after an accident and the prosecutor wants to use the Penal Code. Articles that are used are related to endangering the lives and properties of others and are stated in a way that is related to a specific person, not an organization.

It is therefore doubtful whether the decision to use articles from the Penal Code are the correct way to prosecute: they are directed towards persons and not to organizations, despite the fact that these same articles can be used against organizations. The impression might come up that the prosecutor uses the easy way and prosecutes the persons and not the organizations. This will lead to less improvement as the organizations are not threatened by prosecution.

Paragraph 8.2.3: investigations at the macro level

Rosenthal describes the diminishing tolerance towards accidents and disasters (Rosenthal, 2001) and mentions several high-profile accidents in the 80s, and later like Bhopal, the Challenger accident, Chernobyl, the Herald of Free Enterprise, Piper Alpha, the El Al crash in Amsterdam and the Hercules accident at Eindhoven airport. This diminishing tolerance is also seen as an element of the precautionary culture. Rosenthal states that society is no longer used to accidents and disasters like the ones that are mentioned, explaining that this leads to a vulnerability paradox that society in general is vulnerable of relative small disturbances. Disasters damage the expectancy pattern and are seen as a breach of fundamental values of safety in society, which can be brought back to "holes" in legislation or broad system failures. This leads to "a lower acceptance of disasters and

accidents in society and politicians, lawyers, journalists and relatives struggle for a place in the safety arena” (Rosenthal p.82). This is the next level: the macro level.

Rosenthal mentions that the claim culture as seen in the United States of America is not (yet) present in the Netherlands, but that prosecutors make themselves more visible after decennia of absence which seems to have started after the El Al crash in the Bijlmer (Rosenthal p.84). It is however very difficult for the judicial system to establish the judicial accountability of organizations while imprisonment is only possible for a natural person and not for an organization. As stated before it is easier for the prosecutor and the police to prove that a front line operator has breached the rules. The judicial system has up to now not done a lot of prosecutions at an organization level or system level. This leads to the outcome that the front line operators are treated as the scapegoats of the system. One case where this happened, according to Rosenthal (p. 89) is the Hercules crash where the court stated that the prosecution (which came through the mentioned article 12 procedure) was in the interest of society.

Paragraph 8.3: the problems and a solution with these levels

Politicians have to choose in the name of society between these levels and they have to decide about the precedence of the investigations. Do they want to improve safety of activities which carry risk with them? Do they want investigations that have depth and come to the real causes from the systems point of view? Do they want system safety which leads to safety for society as a whole? Or is their choice more towards punishing people? Do they want the easy way of prosecution of the front line operators, which has the risk of less information for improvement? Do they want scapegoats?

Dutch (aviation) legislation does not hold a prevalence for the investigations after an accident or (serious) incident. Investigations, performed by the Dutch Accident Investigation Board and the judicial authorities led by the public prosecutor, can therefore be seen at the same level. This leads to discussions on competency, as were seen after the crash of a Turkish Airlines Boeing 737 in February 2009, when both authorities claimed the use of the flight data and cockpit voice recorders.

This claim is not an isolated Dutch case. The same types of events have been seen in Italy and France where judicial authorities confiscated the wreckage of an aircraft after an accident has happened and representatives of Accident Boards were not able to approach the wreckage and do their investigations (Flight Safety Foundation, 2009).

Politicians will have to make choices for the short term or the long term, but they do not seem to make the choices that lead to improvements on the long term. Based on this investigation it is not possible to come to conclusions why politicians do not decide about the precedence of investigation.

To come to improvements the Just Culture might come for assistance. Politicians can use the ideas of the Just Culture to come to a solution which investigations have priority. They are the people who draw the lines in society: in a Just Culture people can make mistakes and human error is accepted as part of the work of front line operators without being

punished (irrespective of who gives the punishment). It will lead to a situation in society where safety improvements can be reached, as front line operators feel free to report incidents and where “dips in the reporting of incidents” as mentioned by Brügger will not be seen in organizations (Brügger, 2003).

Paragraph 8.4: reporting or not reporting, that is a part of the question

This issue is of importance as improvements can be made when people do report incidents, whether severe or not.

The reasons for reporting or not reporting, as mentioned by Annas, Leape and Tamuz, have been seen: pilots and controllers report those incidents which can be traced in the recorders on board an aircraft or present in ATC systems. They do not report because of shame, because reporting is not made easy, because there is a fear of punishment especially by the judicial authorities. These reasons for not reporting were also seen in the other domains that were (briefly) investigated. It must be stressed that the fear for judicial investigation and punishment was seldom mentioned as the first item for not reporting incidents.

From the interviews it can be derived that people do not report all incidents. Although the reasons might be different for not-reporting, they act as an agent with a free will. Regulations that mandate reporting are not leading. Some interviewees reported that they are not even aware of the complete contents of the regulations or that they are not able to reporting every item.

Paragraph 8.5: cultural changes in society

The changes in society from a risk culture to a precautionary culture have led to the point where citizens require the government to take action when risks are perceived. When behaviour is unwanted, this behaviour is described in terms of new legislation and is prosecuted and punished when not adhered to. Aviation is complex and does sometimes lead to disasters: each year people die because there were accidents in aviation.

When casualties are seen, police and prosecutors come to the scene and treat the accident as the site of a major crime in order to get an investigation started. This is often based on the fact that people died not because of natural causes. Society is then stated as the driving force to perform the investigation and to punish those who are responsible for the accident. But despite the safety records of aviation with a decline year after year for accidents and casualties (Boeing Commercial Airplanes, 2008), and the fact that aviation is an ultra-safe activity which has reached a safety record at a mythical barrier of one disastrous accident per 10 million events (10^{-7}) (Amalberti, 2001), accident will still happen.

When the precautionary culture will progress further in society and adverse events like accident will lead to more prosecution and punishment, the possibilities for aviation as a whole to improve the system safety through the reports of incidents will become less as people are less and less inclined to report. Interviewees have indicated that they fear that

the reports can and will be used against them, which use is contradictory to the principle of *nemo tenetur* as stated in the Procedural Codes.

Paragraph 8.6: hindsight bias and outcome bias

Two biases are of importance for the discussion: hindsight bias and outcome bias.

Hindsight bias is the inclination of the retrospective viewer, knowing the outcome of an event, that the event is more predictable than before it took place. It might have an exaggerated sense of their own probable ex ante ability to predict (Hugh & Dekker, 2009). Fischhoff, who provided the evidence for this bias, observed that people were not aware of this bias and that they assimilate the outcome knowledge with what they knew about the event in order to make sense of the past (Fischhoff, 1975). It is known as the “I knew it all along” effect.

Outcome bias refers to the error made in evaluating the quality of the decision when the outcome of that decision is already known. Outcome bias is likely to occur when a person makes a judgement on the appropriateness of actions of another person (Hugh & Dekker, 2009).

Paragraph 8.7: to prosecute or not to prosecute, that is also part of the question

It can be stated that the role of the investigation of accident and (severe) incident with the purpose to find the cause or causes and not to apportion blame or liability, is still necessary. It is at present still very easy to point to the last operator, be he/she a pilot, an air traffic controller, a train driver or a surgeon in a hospital, and to state that he/she has made the wrong decisions. This view is the “Old View”, as stated by Dekker (Dekker, 2006). As the stage, where people work, is often set by others in organizations but also by the authorities and Members of Parliament when they draw up new legislation or change old legislation, this stage is the place where these front line operators have to do their work and investigations must therefore be done according to the New View (Dekker, 2006).

“Old View” is also the easy part after an accident or a (severe) incident. It is apportioning blame. When this is done by the judicial authorities and incidents are investigated and front line operators are prosecuted, they will have a tendency to no longer report. This is the death of the blood stream of incident investigations and close the end of improvement based on other issues than accidents.

In judicial investigations the accident or incident is investigated up to the level where it can be proven that a certain operator did not comply to the regulations. The framework that is being used to prove this, is the law in any sense, be it a general law like the Penal Code or specific law like an Aviation Act. The items that are used as evidence are taken from an accident or incident and those items that point in a certain direction are being used. Accidents and incidents then become a social construct when the accident or incident is constructed in a particular society (in this case the society of law enforcement) and where the rules are seen as the basis to perform work. When work is not done according to the rules, the construction is direct seen.

“New View” is where accidents and incidents are seen within the setting of an organization where people, machines and procedures come together and have a function. When accidents or incidents happen, failures are seen as a symptom of trouble deeper in the system and the explanation of failure becomes the most important part of an investigation. The actions and decisions of people based on the assessment of the situation, made sense to them at the time they performed their actions and made their decisions (Dekker, 2002).

“New View” is difficult to use in judicial investigations. Some reasons for this are:

- one needs the open statement of the people involved, which might cause troubles with the principle of *nemo tenetur*;
- one needs to investigate deeper in organizations, while there is no knowledge of where to investigate;
- witnesses can not be forced to give statement on what they knew about a situation;
- the internal procedures of an organization are not known;
- tasks and responsibilities of persons in the layers of an organization are not known;
- the investigations become time-consuming.

New View judicial investigations are therefore hard to do and the competence do the investigation in this way are doubted by lots of interviewees.

Paragraph 8.8: negligence

It is often stated that people were negligent: statements like “the pilot failed to ...” or similar wordings are used to point in the direction where errors were made and they are every now and then followed by a statement of the level of negligence: “Flight preparation was insufficient and the risks of low flying was not sufficient recognized by the crew, which therefore was an important part in the cause of the accident”.

During the interviews the interviewees often mentioned that a reason for prosecution would be gross negligence from the part of the operator. One can wonder how prosecutors and lawyers approach "gross negligence", "negligent behaviour" and the like. A way that seems acceptable to legal people is through the “Garantenstellung”. But as stated earlier: more training in order to behave more professional and to have sufficient knowledge to perform a job in a professional way, leads to reaching the “gross negligence” sooner.

Van Dijk argues about gross negligence in his work (van Dijk, 2008) and starts from the hypothesis that the prevention of crime will be the general justifying aim of punishment. Van Dijk further argues the following points regarding a just penal system, which in the end leads to the parts of control by a person:

- 1) there can be no punishment without culpability;
- 2) punishment can be no more severe than is necessary from the point of view of prevention;
- 3) retaliation is not a legal goal for punishment: the height of a penalty shall not be determined nor restricted by retributive considerations;
- 4) a severe punishment is only justified if the punished person could have prevented the punishment;

- 5) prevention can induce unequal punishment in equal cases;
- 6) criminal responsibility is dominated by the principle of control: intent, negligence and grounds for the exclusion of negligence should give citizens the opportunity to determine their liability to the penal system.

Van Dijk argues that negligence should be interpreted in a restrictive manner in three ways (from the abstract in the English language):

negligence should require a gross deviation from the standard of care that a reasonable person would observe;

- a) individualized circumstances, such as mental or physical disabilities, age, or lack of experience, should be allowed to negate liability;
- b) negligence should be primarily limited to conscious negligence, in which liability is based on a conscious rule violation.

Elaboration on occurrences with (criminal) intent are not necessary here as it is obvious that these people do not belong into safety systems. Van Dijk adds some interesting things to the discussion of Just Culture, but gives on the other no solution to other things.

Interesting is the 2nd point above i.e. punishment can be no more severe than necessary for the prevention. When thinking of safety occurrences, the prevention of the same thing happening again usually comes from the first hand experience of the operator, who will use this experience in future and come to a higher level of working: it is no longer rule based but holds elements in it to become skill based. Punishment, which is directed towards a front line operator as argued here before, is then of no use.

Another interesting point (the 3rd above) is the fact that retaliation is not a legal goal for punishment. This item is used by prosecutors to state that there is a necessity towards society, towards citizens to punish operators, with the implication that in the end no punishment will or might lead to an undesired state in society.

A last element in his points about negligence (mentioned in c here above) is that errors and mistakes are not related to conscious negligence and conscious rule violation.

These together might be used to improve the view of prosecutors to not act in cases of normal human behaviour in safety occurrences. But again: it is a line that is drawn somewhere by someone.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Chapter Nine: Conclusions

From the point of view of improvement of aviation safety and a Just Culture, punishment is not the right way forward and prosecution can be seen as dangerous, threatening, unjust and unequal, humiliating.

Prosecution is dangerous as it leads to people who only report incidents that can be detected by other means or through other persons. The outcome then is that there is less information that can be used to improve the systems safety.

Prosecution is threatening because in those instances where people do report, it is very doubtful whether the necessary information to improve is given i.e. information about the lines of reasoning and decision making that people have used.

Prosecution is unjust and unequal because it sets the aviation as a very regulated environment at the same level as other means of transport like road traffic which is less regulated.

Prosecution is humiliating because professionals take pride in what they do and they want to do it as best as they can. It is furthermore humiliating because professionals are prosecuted for crimes from law books where the incidents are constructed according to the elements of these crimes.

This investigation has shown that people acting as front line operators will become less inclined to report incidents.

From the point of view of prosecution, aviation can be seen as just another form of transport where punishment will be part of normal life and people will be prosecuted after a violation has been performed. A pilot is no different from a bus driver who is also prosecuted when people die or get wounded after an accident. And when a pilot or an air traffic controller does not comply to the rules, his acts can be seen as dangerous and threatening to safety for society, where prosecution is just, equal and fair. This idea holds truth for prosecutors despite the fact that the investigation is performed on the basis of hindsight bias and outcome bias.

Improvement in safety in high-risk organizations like aviation is based on finding the errors that were made and come to preventive measures. As stated before, this all depends on information from pilots and air traffic controllers, who feel free to report what “went wrong”. In high-risk organizations one of the social characteristics that is mentioned by La Porte (La Porte, 1996) is the more or less formalized effort to continually “search for improvement via systematic gleaning of feedback, and the conduct of program and operational review”. La Porte mentions a continuous search for potential failure and improvement and a willingness to reward discovery and reporting of error, without at the same time assigning blame (p. 64).

Van Dyck (van Dyck, 2009) adds to this that “organizations that are guided by assumptions that reflect a tolerant yet decisive orientation towards error learn more from their errors than organizations guided by tolerant-indecisive, intolerant-decisive or intolerant-indecisive assumptions” and further states that “organisational tolerance is an essential condition for learning from error because it creates openness” (p. 31).

It was on the other side Catino who cited Sagan to have identified in *“The Limits of Safety”* (1993) four obstacles to learning i.e. 1) highly ambiguous feedback for organizations; 2) learning happens in environments which are strongly influenced by political interests; 3) information related to an event is incomplete and inaccurate; 4) the non-disclosure, intended as compartmentalization inside the complex organizations, is the disincentive to share information (Catino, 2008). Of these limits of safety, the non-disclosure is shown in this thesis.

When aviation does want to make the next step in safety and come to further improvements, it is necessary to have the information from front line operators available for safety investigation, and judicial interventions are seen and felt as an intrusion. Judicial interventions lead to less reporting, as seen from the interviews of people in several groups, and “circumnavigating” the rules by reporting only what is stored in electronic systems.

Paragraph 9.1: back to the hypotheses

The following hypotheses were stated:

Hypothesis 1: the start of a judicial investigation, whether followed by prosecution or not, of front line operators will lead to fewer reports about incidents. Are the judicial investigation and prosecution a reason for not reporting incidents?

Hypothesis 2: people who are involved in incidents and accidents are not familiar with the judicial system to a level that prevents self-incrimination. They talk about what has happened to the judicial authorities without realizing that they can incriminate themselves.

Hypothesis 3: front line operators have the free will to report or not report incidents, even when the incidents are severe.

It can be concluded that hypothesis 1 has been proven in this thesis: interviewees see the judicial system as a threat after having reported an incident.

It can be concluded that hypothesis 2 has been proven in this thesis: interviewees have indicated that they are not familiar with the legal system and do not know their legal position.

It can be concluded that hypothesis 3 has been proven in this thesis: front line operators will not report incidents when they are of the opinion that it is either not detected in systems or not reported by others.

Although not hypothesized there is sufficient evidence to state that the change in culture towards a precautionary culture is present in today’s society. Evidence can be seen in the changing opinions in e.g. the judicial investigations, the use of recorders as evidence in judicial proceedings, and the fact that next of kin and other involved in an event can force the prosecutor to prosecute in a certain case, after having appealed at the Court of Appeal. More of these cases were present in today’s society while the motivations to not-prosecute must be based on a solid investigation.

Dekker stated: “When a professional mistake is put on trial, safety almost always suffers. Rather than investing in safety improvements, people in the organisation or profession invest in defensive posturing. Rather than increasing the flow of safety-related information, legal action has a way of cutting off that flow” (Dekker, 2007). This again has been proven in this thesis.

Paragraph 9.2: future improvements or is there a way forward

Is there a way forward? When and how should society punish, if punishment is seen as a solution? Questions have been asked to interviewees regarding future improvements. These questions led to answers that are used to list the following points.

The following improvements can be made for the legislator:

- 1) the legislator (i.e. the European Parliament for Europe and/or the national Parliaments for the European States) shall have to decide which of the several investigations has precedence in order to create clarity: is safety leading or not;
- 2) the legislator should take a clear position as to the use of final reports of an Accident Investigation Board on (judicial, civil or administrative) proceedings, be it as evidence or as steering information;
- 3) improvements in legislation must clearly indicate which data is protected and when the judicial authorities are allowed to use these data;
- 4) reconsider article 5.3 of the Aviation Act: as there is no norm in the article it is applicable to almost every behaviour in aviation and this is seen in jurisprudence in the Netherlands, which makes the article useless.

The following improvements can be made by front line operators and their organisations:

- 5) front line operators should be trained from the start in the ethics of their profession;
- 6) front line operators should be informed during (initial and recurrent) training about their legal position and the consequences of the several positions;
- 7) front line operators should be informed about the possibilities to receive legal advice from a lawyer;
- 8) front line operators should thoroughly read and comment on draft reports of Accident Investigation Boards in conjunction with a lawyer;
- 9) front line operators should make a note of the event, as it is reminded directly after the event, in order to use this during the investigations;
- 10) front line operators should realize that their statements can be used for different proceedings and that they can have a different connotation;
- 11) front line operators should realise that assessments about their acts are done by people outside aviation, often from the paperwork that has been handed to them, and should therefore not hesitate to use experts of certain domains;
- 12) front line operators should be competent and maintain a level of competency in their work by knowledge of the correct procedures and reading incident related information to improve their competence;
- 13) prevention of errors is a responsibility of organizations, to be reached through investigations after reporting of incidents;

- 14) organizations do not need incidents to come to improvements: they can make them when they realize that “the holes are in the system”;
- 15) front line operators and organizations should realize that the police and prosecutorial authorities have a task in society which can not be removed;
- 16) organizations should cater for sufficient personnel to perform the investigations after an incident has been reported and should take care of feedback to the reporters;
- 17) organizations in aviation and the police and prosecutors should try to come to an agreement which cases are to be prosecuted and which not, based on clear criteria, in order to take away the fear in aviation that people can be prosecuted for almost any incident, reported or not;
- 18) organizations have a role towards the safety climate in the organization as well as in society, and the view that society has towards these organizations, and the organizations should take the lead in exchanging safety related information between organizations and with society.

The following improvements can be made by the prosecutor:

- 19) the presumption of innocence should be the start of an investigation;
- 20) prosecutors should act with great care and reserves when selecting cases that are to be prosecuted, especially in the international world that aviation is and prosecutions are known outside the country of prosecution;
- 21) the judicial system must have the trust in the aviations sector that improvements are possible and are made without punishment of front line operators, that honest mistakes are made by normal people doing their normal job, but that gross negligence should be punished;
- 22) legal people, like prosecutors, lawyers and judges, should be trained in human factors and human error, and should become competent in the world of aviation.

The following improvements can be made by the aviation authorities:

- 23) aviation authorities should be careful with more regulations as they might lead to more ways to not comply to the rules without people realizing that they do not comply;
- 24) aviation authorities could be helpful in the formal exchange of incident information in order to improve aviation safety;
- 25) aviation authorities have to work with all parties in their world to re-establish the open culture of reporting incidents.

The following improvements can be made by the aviation world in general:

- 26) the aviation world should realize that immunization against prosecution is not a solution and that there is a legal indisputable right for the prosecutor to prosecute cases within his or her discretionary space;
- 27) aviation world has to work with all parties in their world to re-establish the open culture of reporting incidents.

The following improvements can be made by investigating agencies:

- 28) investigating agencies should not battle for competence, but cooperate;

- 29) more attention has to be given for human factors and human errors in investigations of accidents and incidents.

The following improvement can be made by all parties:

- 30) in the end people have to accept the consequences of their actions when work is performed in a risky environment, even when the outcome is a negative outcome.

As many others have experienced, it became obvious to me that everybody has his or her own interpretation of “gross negligence”, but it has also become clear that the term is used in two different worlds with different meanings: judicial people hold on to a judicial meaning of the term based on jurisprudence or case-law, where front line operators in aviation have an idea about this term that has less contents than judicial people have given it. What is seen as gross negligence in the judicial proceedings is shown in the case of the tail strike, where a normal pilot acts in a normal way doing his normal job, after experiencing an abnormal situation. For people in aviation his behaviour is normal and cannot and will not be qualified as gross negligence.

Where the majority of the interviewees were of the opinion that safety prevailed over punishment and that the police and prosecutor have to act with care and responsibility towards aviation, they themselves were of the opinion that, with the law on their side, judicial investigation also were necessary next to other investigations. There is no discussion whether the law is on the side of the judicial system: it is discussion where the lines around gross negligence and culpability are drawn by people who do not perform their daily work in aviation. The culture of judicial accountability, which can be seen as a part of the precautionary culture, leads to the way of more prosecutions for accidents and (severe) incidents than 10 of 15 years ago.

On one end of the spectrum there is society that wants more safety, less risks, and prosecution of those who deviate from a standard. The more training people have had, the higher the requirements are to those people to do their work: the “Garantenstellung” gives legal people an instrument to assess, from a legal point, what gross negligence might encompass.

On the other end of the spectrum we find the front line operators who start their day of work to do the best they can and who sometimes make mistakes which lead or might lead to deviations from that same standard. They have to report these deviations thereby creating a possibility or an imagined possibility to be prosecuted for this event. These mistakes are most of the time not felt or seen by colleagues as errors with gross negligence.

As the MP stated: “It will be or best avail to society when the systems improve. But the general public wants the heads to roll”.

There is a big gap to be bridged. This thesis might help in bridging this gap.

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Appendix 1: list of abbreviations

ACARS	Aircraft Communications Addressing and Reporting System
AIB	Accident Investigation Board (in this thesis a generic term, not related to a specific board unless stated otherwise)
ATC	air traffic control
ATCO	air traffic control officer
ATIC	air traffic incident committee
ATPL	airline transport pilot license
CFI	commercial flight instructor
CFII	commercial flight instructor (instrument instruction)
CPL	commercial pilot license
CRM	crew resource management
CVR	cockpit voice recorder (this recorder records the conversation in the cockpit)
ERA	European Regional airliner Association
FAA	Federal Aviation Administration
FB	Free Balloon
FI	flight instructor
FDR	flight data recorder (this recorder records the movements of the aircraft in all axes and parameters from e.g. engines)
GPWS	ground proximity warning system
ICAO	International Civil Aviation Organisation
IMC	Instrument Meteorological Conditions i.e. condition below certain set values in terms of visibility and distances from clouds depending on the altitude where an aircraft flies and the class of airspace it flies in.
IR	instrument rating
JAR-FCL	Joint Aviation Requirements – Flight Crew Licensing
kiAS	knots Indicated Air Speed (the speed as seen by the flight crew in the cockpit), where one knot is the equivalent of 1852 meters
MP	Member of Parliament
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i> (a multi-drug resistant bacterium that is responsible for difficult-to-treat infections in humans)
PPL	private pilot licence
RTO	rejected take-off (take-off that is aborted at a certain speed)
SMS	Safety Management System
TCAS	traffic collision avoidance system
VFR	Visual Flight Rules
VMC	visual meteorological conditions (conditions are related to the class of airspace)

What is the Relationship between the increased use of the Penal Code and Safety Reporting

Appendix 2: lists of questions that were used during the interviews

Below are the questions that were asked to the various interviewees.

Group 1: pilots from several disciplines in aviation who have experienced Safety Board and police investigations

1. general:
 - 1.1. date of incident or accident
 - 1.2. short description
 - 1.3. direct outcome (number of casualties, wounded, damage)
 - 1.4. age of interviewee (during incident/accident and at the time of interview)
 - 1.5. own position (captain/co-pilot/air traffic controller/other)
 - 1.6. licence and experience
2. the investigations:
 - 2.1. which investigations have been performed (own organisation/accident board/police and/or prosecutor)
 - 2.2. other organisations that have performed an investigation (fire brigade/ambulance service/other)
 - 2.3. was the own position known at the start of the investigation?
 - 2.4. if not, what was the cause?
 - 2.5. how often were the interviews performed by the mentioned organisations?
 - 2.6. what was the sequence of these interviews?
 - 2.7. are the recorded interviews according to the own truth of the incident or accident?
3. prosecution:
 - 3.1. has there been a prosecution?
 - 3.2. what were the (formal) grounds of the prosecution?
 - 3.3. is documentation available?
 - 3.4. was the prosecution expected? From which moment?
 - 3.5. how long did the prosecution take?
 - 3.6. was expertise used during the prosecution? If so, by whom and what kind of expertise?
 - 3.7. did you use a lawyer for the defence?
 - 3.8. what was the first outcome of the prosecution?
 - 3.9. was the report of the accident board used during the prosecution trial? On whose initiative?
 - 3.10. was there an appeal against the verdict? If not, why not?
 - 3.11. what was the outcome of the appeal?
 - 3.12. what was the effect of the prosecution: a) for the interviewee b) for others in the environment?
 - 3.13. is the outcome of the prosecution according to the own experience of the incident or accident?
 - 3.14. other details of the prosecution?
4. outcome of the investigation of the accident board:
 - 4.1. has the concept report of the board been commented?
 - 4.2. did this influence the report?
 - 4.3. is documentation available?
 - 4.4. other details of the investigation of the accident board

5. civil case:
 - 5.1. has there been a civil case (tort)?
 - 5.2. is documentation available?
 - 5.3. when did this case start?
 - 5.4. has the claim been divided between those involved in the accident?
 - 5.5. other details of the civil case
6. consequences of these investigations for safety and safety information:
 - 6.1. did you talk to other, involved in the incident or accident, after it happened?
 - 6.2. has information been given which was not yet known at that time?
 - 6.3. is this (in 6.2 mentioned) information been used during the interviews?
 - 6.4. has information not been given or used in the mentioned investigations which is relevant for safety?
 - 6.5. why was this information not given or used?
 - 6.6. if there would have been less investigations, would you have given or used this information
 - 6.7. which investigations should be deleted?
 - 6.8. has the own view about the accident or incident, as it was known shortly after the accident or incident, changed by later information (from others in the accident or incident; from authorities; from the reports)?
 - 6.9. other relevant information
7. settlement:
 - 7.1. what was the role of the insurance company (where applicable)?
 - 7.2. has the insurance company performed an own investigation?
 - 7.3. has the insurance company used other information?
 - 7.4. have you been in contact with victims or relatives?
 - 7.5. what happened to the other persons, involved in the accident or incident?
8. looking back to what happened:
 - 8.1. would the same event now be treated in a different way?
 - 8.2. do you have the feeling or the certainty that interviews with the police and other judicial authorities were part of a self-incrimination?
 - 8.3. what would you now do different?
 - 8.4. do you know whether information about safety is shared less a) formally in the own organisation b) informally between colleagues?
 - 8.5. what can be learned for the future?
 - 8.6. what can other people learn from your experience in this accident or incident?
 - 8.7. would a disciplinary jurisdiction/trial have been a solution?
 - 8.8. would a disciplinary jurisdiction/trial have been experienced in a different way?
 - 8.9. did you feel supported by your organisation (where applicable)?
 - 8.10. how did you experience the total period?
 - 8.11. how would, in your opinion, an “ideal investigation” look like?
 - 8.12. other relevant information

Group 2: pilots/ ATCO's without external investigation

1. general:
 - 1.1. age of the interviewee
 - 1.2. number of years in aviation

- 1.3. experience
- 1.4. own position (captain/co-pilot/air traffic controller/other)
- 1.5. licence and experience
2. incidents:
 - 2.1. have you ever been involved in an incident that was mandatory to report (either based on company rules or based on legislation)?
 - 2.2. was this incident experienced while performing in a team?
 - 2.3. short description of the incident (more incident can be given)
 - 2.4. was the incident reported?
 - 2.5. why was it reported (e.g. because the other party (colleague in cockpit; ATC) reported the incident, or because the severity of the incident gave rise to a report)?
 - 2.6. why was the incident not reported?
 - 2.7. in which way did the other party handle the incident?
3. history:
 - 3.1. are you familiar with incidents of others in the past?
 - 3.2. were these incidents reported?
 - 3.3. was or were this/these incident(s) investigated?
 - 3.4. if yes, by whom a) own organization b) accident board c) police/prosecutor d) other
 - 3.5. what was the outcome of the investigation?
 - 3.6. did this outcome influence the (not) reporting of own incidents?
4. consequences:
 - 4.1. if incidents are not reported, how can other learn from them (e.g. bar talk)?
 - 4.2. could safety be improved by reporting?
 - 4.3. what can be reasons for people to not report an incident?
 - 4.4. which improvements can be made?
 - 4.5. other relevant information

Group 3: questionnaire student-pilots

1. It is mandatory to report accidents and (serious) incidents. Is this necessary?
 - 1.1. yes because ...
 - 1.2. no because
2. Which investigations are necessary or wanted after an accident or (serious) incident? The answers can be "yes" or "no".

	Yes	no
2.1. Accident investigation board (hereafter referred to as OvV)		
2.2. own organisation like an airline		
2.3. police and prosecutor		
2.4. other i.e.		
3. What should be the purpose of these investigations? Place a cross in the applicable square. More than one cross can be placed. Motivation might be given.

	Learning for involved persons	for others	punishment for involved persons	deter others
3.1. accident board:				
3.2. own organization				

- 3.3. police and prosecutor
3.4. other i.e.
4. Might safety investigations (related to learning) and judicial investigation (related to punishment) be combined?
- 4.1. yes because ...
4.2. no because
5. What are the perceived risks of judicial investigations and prosecution (i.e. appear in court) and safety cases?
6. which evidence should be allowed to be used in a prosecution:
- | | yes | no |
|---|-----|----|
| 6.1. information from the flight data recorder | | |
| 6.2. information from the cockpit voice recorder | | |
| 6.3. final report of the accident investigation board | | |
| 6.4. other information (specify) | | |
| 6.5. other relevant information about this question that you should like to give. | | |
7. For which kind of cases do you think that a judicial investigation and a possible prosecution is necessary or wanted? More answers are possible.
- | | Necessary | wanted |
|---|-----------|--------|
| 7.1. use of alcohol and drugs during flight | | |
| 7.2. intentional non-compliance to rules | | |
| 7.3. negligence | | |
| 7.4. accident with a lethal consequence | | |
| 7.5. accidents with casualties | | |
| 7.6. accidents with damage | | |
| 7.7. accidents always | | |
| 7.8. only serious breaches of the rules | | |
| 7.9. any breach of the rules | | |
| 7.10. other i.e. | | |
8. Disciplinary jurisdiction is being used in certain sectors. In aviation disciplinary proceedings were known until 1992 and it does not exist at this moment. Disciplinary trials implicate that others from the same sector give their judgement about what happened and that punishment is possible.
- Answers and motivation
- 8.1. would disciplinary jurisdiction be useful in aviation?
8.2. should disciplinary jurisdiction lead to punishment?
8.3. would disciplinary jurisdiction be experienced in another way that a penal trial
9. how should you want to learn from accidents and incidents? Place a cross in the applicable square. More than one cross can be placed. (yes-no answers possible)
- 9.1. through short reports
9.2. through reports of the OvV
9.3. through reports of the own organisation
9.4. through intern publication of the own organisation
9.5. through judicial intervention and publication
9.6. through disciplinary trials and publication
9.7. other i.e. ..
10. general:
- 10.1. age

10.2. male/female

Group 4: police and prosecutor

1. general
 - 1.1. Can you give a brief indication of the cases the Aviation Police has investigated or is investigating
 - 1.2. against which persons or organizations were the investigations directed
 - 1.3. what were the direct consequences of the accidents or incidents
 - 1.4. were other parties than the ones against which the investigation was directed, involved in the accident or incident
 - 1.5. has there been juridical support for parties
2. investigations
 - 2.1. which investigations have been performed after an accident or incident
 - 2.2. which other organisations have performed an investigation
 - 2.3. was the position of the suspect known at the start of an judicial investigation
 - 2.4. if not, what was the cause
 - 2.5. was it obvious for the persons, involved in an accident or incident, what their position was in the different investigations
 - 2.6. how often were people interviewed
 - 2.7. is there a certain sequence in these interviews
 - 2.8. was there a juridical support for the suspect and from which moment
3. the investigations
 - 3.1. prosecution
 - 3.1.1. which criteria are used for a deeper investigation of an accident or incident
 - 3.1.2. who or what is the subject of the investigation
 - 3.1.3. which criteria are used to come to a prosecution
 - 3.1.4. has there been a prosecution
 - 3.1.5. what are the formal rules for a prosecution
 - 3.1.6. is documentation available about the prosecution e.g. as guidelines
 - 3.1.7. is prosecution expected by the subjects of the investigation and if so, from which moment
 - 3.1.8. how long does this procedure take
 - 3.1.9. are experts used and which expertise
 - 3.1.10. is there an indication of the outcome of the prosecution in the first instance (Court of Justice)
 - 3.1.11. has the final report of an Accident Board been used and who initiated this
 - 3.1.12. was there an appeal? If not, why not?
 - 3.1.13. is there an indication of the outcome in the appeal court
 - 3.1.14. which effect did the prosecution have
 - 3.1.15. is the outcome of the prosecution as was expected
 - 3.1.16. other details of the prosecution
 - 3.1.17. do you have juridical knowledge of national and international rules and regulations
 - 3.2. Accident Investigation Board
 - 3.2.1. have you given comments on the concept report of the Board

- 3.2.2. did this influence the final version
 - 3.2.3. is documentation available
 - 3.2.4. can details about the cooperation between the police and the Board be given
- 3.3. Civil case
 - 3.3.1. is the collected information used in a civil case
 - 3.3.2. is documentation available
 - 3.3.3. other details
- 4. consequences of the investigations for safety
 - 4.1. related to the knowledge of the suspect about his position: can one state that there was some self-incrimination? Did this add to the outcome in court?
 - 4.2. has information not been given or used in the here mentioned investigations which was of importance for safety
 - 4.3. was the information given or used when there would have been less investigations
 - 4.4. which investigations should be deleted
 - 4.5. other information
- 5. settlement
 - 5.1. what was the role of the insurance company (where applicable)
 - 5.2. did the insurance company perform it's own investigation
 - 5.3. is any other information been used by the insurance company
- 6. looking back
 - 6.1. is there a feeling or a certainty that the interviews with the police have helped with a conviction (self-incrimination)
 - 6.2. what would people have to do different
 - 6.3. what are the ideas about the outcome of the penal system for safety
 - 6.4. is there any knowledge whether the investigations of police and prosecutor have led to less of more sharing of safety knowledge
 - 6.5. what can be learned for the future
 - 6.6. what can others learn from prosecutorial proceedings after an accident or incident
 - 6.7. can disciplinary proceedings be an advantage
 - 6.8. will disciplinary proceedings be seen different
 - 6.9. how would an ideal investigation look like

Group 5: lawyers

- 1. general
 - 1.1. Can you give a brief indication of the cases the Aviation Police has investigated or is investigating
 - 1.2. which party did you represent in the prosecution
 - 1.3. what were the direct consequences of the accidents or incidents
 - 1.4. were other parties than the ones against which the investigation was directed, involved in the accident or incident
 - 1.5. has there been juridical support for the other parties
- 2. investigations
 - 2.1. which investigations have been performed after an accident or incident
 - 2.2. which other organisations have performed an investigation
 - 2.3. was the position of the suspect know at the start of an judicial investigation
 - 2.3.1. if not, what was the cause

- 2.4. how often were people interviewed in this event
- 2.5. from which moment was juridical support given
- 2.6. were the statement that were given according to the own truth of what had happened
3. the investigations
 - 3.1. prosecution
 - 3.1.1. has there been a prosecution
 - 3.1.2. which criteria are used to come to a prosecution
 - 3.1.3. is documentation available
 - 3.1.4. was the prosecution expected and if so, from which moment
 - 3.1.5. how long did the prosecution last
 - 3.1.6. were experts used in the prosecution
 - 3.1.7. what was the outcome of the prosecution in the first instance
 - 3.1.8. has the final report of an Accident Board been used and who initiated this
 - 3.1.9. was there an appeal? If not, why not?
 - 3.1.10. what was the outcome of the appeal
 - 3.1.11. is the outcome of the prosecution as was expected
 - 3.1.12. other details of the prosecution
 - 3.1.13. do you have juridical knowledge of national and international rules and regulations
 - 3.1.13.1. if not, how was this knowledge gathered
 - 3.2. Accident Investigation Board
 - 3.2.1. have you given comments on the concept report of the Board
 - 3.2.2. did this influence the final version
 - 3.2.3. is documentation available
 - 3.2.4. other details
 - 3.3. Civil case
 - 3.3.1. is the collected information used in a civil case
 - 3.3.2. is documentation available
 - 3.3.3. when did the civil case start
 - 3.3.4. has the claim been divided between parties
 - 3.3.5. other details
4. consequences of the investigations for safety
 - 4.1. related to the knowledge of the suspect about his position: can one state that there was some self-incrimination? Did this add to the outcome in court?
 - 4.2. has information not been given or used in the here mentioned investigations which was of importance for safety
 - 4.3. was the information given or used when there would have been less investigations
 - 4.4. which investigations should be deleted
 - 4.5. other information
5. settlement
 - 5.1. what was the role of the insurance company (where applicable)
 - 5.2. did the insurance company perform it's own investigation
 - 5.3. is any other information been used by the insurance company
6. looking back
 - 6.1. would the same event now be treated differently

- 6.2. is there a feeling or a certainty that the interviews with the police have helped with a conviction (self-incrimination)
- 6.3. what would people have to do different
- 6.4. is there any knowledge whether the investigations of police and prosecutor have led to less of more sharing of safety knowledge
- 6.5. what can be learned for the future
- 6.6. what can others learn from prosecutorial proceedings after an accident or incident
- 6.7. can disciplinary proceedings be an advantage
- 6.8. will disciplinary proceedings be seen different
- 6.9. how would an ideal investigation look like
- 6.10. other relevant information

Group 6: judges

1. general:
 - 1.1. age of the interviewee
 - 1.2. number of years as judge
 - 1.3. experience with safety cases
 - 1.4. number of years in aviation
 - 1.5. experience in aviation
 - 1.6. own position (captain/co-pilot/air traffic controller/other)
 - 1.7. licence and experience
 - 1.8. knowledge about international legislation (ICAO, EU)
2. incidents and accidents:
 - 2.1. which investigations (spread of cases) have you been involved in
 - 2.1.1. can you give a short description of these cases
 - 2.2. what is the opinion about mandatory reporting of an accident or incident
 - 2.2.1. is protection of reporters necessary in relation to the Rome Treaty
 - 2.3. what is the opinion that people do not report incidents
 - 2.3.1. why should people not report
 - 2.3.2. how do we deal with people who do not report
 - 2.4. should there have to be an exclusive right for an investigation board and companies with an SMS to perform investigations related to safety
 - 2.5. which cases should be investigated and/or prosecuted by the prosecutor
 - 2.5.1. are these just the case with a non-natural death
 - 2.5.2. and which cases not
 - 2.6. who should investigate accidents and/or incidents
 - 2.7. is there a reason to investigate accidents and incidents by the police and/or prosecutor
 - 2.8. Would an Accident Investigation Board have to work slower in order to have their information not to be used by the police and/or prosecutor
 - 2.9. is there an owner of safety information
 - 2.9.1. should any arbitrary body have access to the information
 - 2.9.2. how fast should this information be released
 - 2.10. is there a necessity to punish after an accident or incident
 - 2.10.1. does the severity of an accident relate to punishment
 - 2.11. what should be the purpose of punishment

- 2.12. is punishment a privilege of the prosecutor and/or the judge
- 2.13. do international regulations like those of ICAO and the EU have any meaning for judges in penal and/or civil cases
- 2.14. Does jurisprudence from other countries have any meaning for judges in panel and/or civil cases
- 2.15. Is there a function for disciplinary proceedings, as we have known previously
- 2.16. will a possible judicial threat have negative consequences for safety investigations
3. consequences
 - 3.1. Dutch government is bound by Annex 13 through the Chicago Convention, but does not incorporate everything in Dutch legislation. How should we handle this
 - 3.2. How do we treat people who do not report
 - 3.3. How do we treat people who do not cooperate with safety investigations
 - 3.4. should a final report of an Accident Investigation Board or a company be used for assessment of the case by a judge or a disciplinary board
 - 3.4.1. or should we have a prohibition on this
 - 3.5. which improvements are possible
 - 3.5.1. is a good relation between judicial and safety investigations possible
 - 3.6. how would an “ideal investigation” or an “ideal situation” look like
 - 3.7. other relevant information

Group 7: CAA

- is there knowledge about international regulations
 - how far are they known
- is it of importance to adopt these regulations in national law once a State has signed a the Chicago Treaty
- is there knowledge with ICAO – Eurocontrol – JAR’s – EASA
- is there knowledge about the Just Culture
- is there knowledge with national regulations concerning the investigation of accidents and incidents
- what is the opinion of an authority about discrepancies in legislation
 - up to what level should regulations settle things
- what is the opinion of an authority for the diversity of investigations that start after incidents and accidents
 - what is the idea behind these doublings
- what is the opinion of an authority about the tension between judicial and safety investigations?
 - what should be the duty of the prosecutor
- is there political pressure after an accident or incident
 - do politicians want to see action
- what would an authority like to change
- which messages see authorities come from incidents and accidents
- should there be a judicial investigation after an accident or incident
- what should the purposes of a judicial investigation be
- ought there to be protection for reporters (after an accident? After an incident?)
- how do we want to improve safety?

- for which cases do we want prosecution? And administrative proceedings? Can clear lines be drawn towards front line operators?
- what do we really want: improvement of the system for safety or prosecution which might lead to people not reporting
- what is the opinion about disciplinary proceedings
- do we need article 5.3 of the Aviation Act
- other relevant information

Group 8: insurance

1. general:
 - 1.1. what is the role of insurance companies(where applicable)
 - 1.2. which kinds of events leads to an involvement of the insurance company
 - 1.3. qualifications of the policyholder
2. investigations:
 - 2.1. which investigative material is normally used when handling claims
 - 2.2. does the insurance company perform an own investigation
 - 2.3. which investigative material is used after an incident or accident
 - 2.4. has other information been used by the insurance companies
 - 2.5. do people know at the beginning of an investigation what their own position is
 - 2.6. if not, what might be the reason
3. judicial and safety investigations
 - 3.1. judicial investigations
 - 3.1.1. do insurance companies take a prosecution into account
 - 3.2. safety investigations
 - 3.2.1. are final reports of accident investigation boards used by insurance companies
 - 3.2.2. is there a policy for this item
 - 3.2.3. are the reports leading in settling claims and if not, what is leading
 - 3.2.4. other details where relevant
4. consequences of investigations for safety
 - 4.1. is a judicial investigation seen as a threat for the improvement of safety, and why (not)
 - 4.2. which investigations should not be performed
 - 4.3. other relevant information
5. settlement
 - 5.1. how long do civil cases normally take
 - 5.2. other relevant information
6. looking back
 - 6.1. what can be learned from the past towards the future
 - 6.2. would disciplinary proceedings be of help
 - 6.3. would disciplinary proceedings be experienced in another way
 - 6.4. how would an “ideal investigation” look like
 - 6.5. other relevant information

Group 9: former members of ASB

1. general:
 - 1.1. age
 - 1.2. years in aviation
 - 1.3. experience
 - 1.4. own position (captain/co-pilot/air traffic controller/other)
 - 1.5. licence
 - 1.6. how did you become a member of the Board
2. investigated incidents and accidents:
 - 2.1. in which cases were you involved (spread of cases), including a short description?
 - 2.2. what is your opinion about mandatory reporting of accidents and (serious) incidents? Why is this necessary?
 - 2.3. what is your opinion that accidents and/or (serious) incidents are not reported?
 - 2.4. why would people not report?
 - 2.5. which events should be investigated? And which not?
 - 2.6. who/which organisations should investigate accidents and incidents?
 - 2.7. is there a reason for police and/or judicial authorities to investigate accidents and/or (serious) incidents?
 - 2.8. should an accident investigation board work slower in order to not have the information being used by the police and/or prosecutor?
 - 2.9. is there an owner of safety information? How fast should safety information be spread?
 - 2.10. is there a necessity to punish people after an accident or incident? Should there be a relation between the severity of an accident or incident and punishment?
 - 2.11. what has to be the goal of punishment?
 - 2.12. is punishment a prerogative of the judicial authorities?
 - 2.13. or is there a function for a disciplinary court, as known in the past?
 - 2.14. will a possible judicial threat be adverse for safety information?
 - 2.15. are you familiar with cases in the past that had to be reported but were not reported?
 - 2.16. what should be done with comments on a concept report of an accident investigation board? What should be done when comments come after publication of the final report?
3. consequences:
 - 3.1. Dutch government is bounded by the rules of Annex 13 of the Chicago Convention, but does not have legislation that complies to this Annex. How should we deal with this?
 - 3.2. if an accident or incident is not reported, how can we learn from it (.e.g. bar talk)?
 - 3.3. how should we deal with the people who do not report?
 - 3.4. how should we deal with people who do not cooperate with investigations? Prosecution?
 - 3.5. Might final reports of accident investigation boards be used in judicial or disciplinary proceedings? Or should this be forbidden?
 - 3.6. which improvements are possible? Is good cooperation possible between judicial and safety investigations?
 - 3.7. how would, in your opinion, an “ideal investigation” look like?

3.8. other relevant information

Group 10: Media

1. general:
 - 1.1. age
 - 1.2. number of years in the job
 - 1.3. experience
 - 1.4. own position (reporter/journalist)
2. investigated incidents and accidents:
 - 2.1. short description of the daily work
 - 2.2. what is the function of journalism in society?
 - 2.3. is this also a watchdog function?
 - 2.4. what is the function of journalism in disasters, accidents and incidents?
 - 2.5. what is the interest of the public in disasters, accidents and incidents?
 - 2.6. do journalists have knowledge of the legislation around accidents and incidents?
 - 2.7. in which way is safety of interest to the public? Is safety alive in the public?
 - 2.8. is the reporting of incidents and accidents important from a journalistic point of view?
 - 2.9. what should be done after an accident or incident is reported?
 - 2.10. Who should perform the investigation? Is there a place for the own organisation?
 - 2.11. Should the outcome of an investigation be made public? Also when the investigation has been performed by the own organisation?
 - 2.12. Is there a place in society for a judicial investigation after an accident of incident? In which cases? Why?
 - 2.13. Might the information, coming from a safety investigation from the Accident Board or the own organisation, be used in a judicial investigation?
 - 2.14. Should the "honest" mistakes be prosecuted?
 - 2.15. If this leads to a reduction in reporting, what should be done?
 - 2.16. What is the opinion about disciplinary proceedings?
3. history:
 - 3.1. Do (or did) the media follow the investigations after an accident?
 - 3.2. Is there a necessity to follow these investigations?
4. consequences
 - 4.1. What might be the reasons for not reporting?
 - 4.2. which improvements are possible
 - 4.3. additional information

Group 11: outside aviation i.e. medical world and ships pilot

1. general:
 - 1.1. age of the interviewee
 - 1.2. number of years in the own field
 - 1.3. experience (expressed as is normal in the own field)
 - 1.4. own position (captain/co-pilot/air traffic controller/other)
 - 1.5. authorisation or licence and experience

2. incidents:
 - 2.1. can a short description be given about the normal work
 - 2.2. is legislation applicable on the work
 - 2.2.1. what does it consist of
 - 2.3. is there a (legal or otherwise) mandate to report deviations (incidents and accidents)
 - 2.4. to which authority
 - 2.5. who performs the investigation after a deviation (multiple possibilities)
 - 2.6. have you ever been involved in an incident that had to be reported (based on legislation of company procedures)
 - 2.7. did this happen in a team
 - 2.8. can the incident be described in brief terms
 - 2.9. is the incident reported
 - 2.10. why was it reported (e.g. because the other party reported the incident or because the situation gave rise to this)
 - 2.11. what was it not reported
 - 2.12. in which way did the other person(s) deal with the situation
 - 2.13. what was the outcome of the investigation
 - 2.14. is the prosecutor involved in these deviations
 - 2.14.1. if not, why not
 - 2.15. is there a standard policy from the prosecutor known
 - 2.16. does this lead to less reports
3. history
 - 3.1. are you familiar with incidents of other people
 - 3.2. were these incidents reported (according to the information above)
 - 3.3. was there an investigation after the reporting
 - 3.4. if yes, who performed the investigation
 - 3.5. what was the outcome of the investigation
 - 3.6. did this outcome have an influence on reporting of own incidents
4. consequences
 - 4.1. if an incident is not reported, how can we learn from it
 - 4.2. could safety be improved by reporting incidents
 - 4.3. what might be reasons for not reporting incidents
 - 4.4. which improvements might be possible
 - 4.5. other relevant information

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Appendix 3: examples of incidents given during the interviews

The following examples were given by air traffic controllers and pilots who have been involved in both a safety investigation and a judicial investigation (*remark*: the numbering of cases that is used in chapter 5 does not correspond with the list below in order to protect the interviewees):

- a landing accident at the end of a balloon flight;
- three mid air collisions between aircraft;
- precautionary and emergency landings with aircraft due to technical problems;
- gear-up landings;
- crash of an instruction flight;
- a mid air collision between two hot air balloons leading to a crash landing of one balloon;
- during hazy conditions a runway incursion occurred with several system items leading to the incursion;
- a crash landing in a lake at the end of a balloon flight, caused by sudden adverse weather conditions;
- crash landing of an amphibian aircraft;
- sudden crash landing because of adverse wind and weather conditions;
- sudden crash landing because of technical causes.

The following examples were given by air traffic controllers and pilots who have not been involved in both a safety investigation and a judicial investigation:

- loss of separation because of wrong assessment of a situation
- runway incursions
- avoiding action instructed to an aircraft to prevent a severe loss of separation
- aircraft blown over by jet blast of another aircraft
- take-off of an aircraft on a clearance given to another aircraft leading to a go-around of a third aircraft
- lift-off with a hot air balloon during a heavy rain shower in front of a large crowd, where the lift-off should not have been done;
- flying in conditions below VMC near an aerodrome;
- several near misses with other aircraft;
- landing on the wrong runway;
- sink rate warnings
- several go-arounds due to different causes;
- take-off without the necessary load sheet in the cockpit after a severe delay;
- cabin crew working in the cabin while they were not fit to fly;
- loss of control leading to a recovery at 50 feet above the water;
- flying at a speed above the assigned speed;
- flying too low during the approach between the mountains, leading to a GPWS warning;
- several TCAS warnings;
- flying in a mountain wave above mountainous areas;
- descending below the assigned level;
- a flight in weather conditions with severe wind forces, leading to two go-arounds which then lead to a situation with low fuel;
- decompression;
- door not correctly closed, leading to a warning and a return to the departure aerodrome;

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- taxiing on the wrong taxi track;
- not established at 500 feet in VMC during the approach with engine idle;
- approach during wind shear conditions;
- wrong altimeter setting;
- rejected take-offs;
- bird hits, some leading to severe damage to an aircraft;
- flight with overheated engines, only discovered after the flight;
- precautionary landings;
- landings leading to damage to the tail rotor.

Appendix 4: timeline

Year	
1900	approximate end of the blame culture ¹² and start of the risk culture ¹³
1937	coming into force of the Aviation Disaster Act, which gives the Dutch Investigation Board for Safety the powers of disciplinary punishment
1958	change in Aviation Disaster Act (until it was abolished in 1992)
1963 – 1988	approximate period during which changes in the Dutch Aviation Disaster Act were discussed mainly within the circles of civil servants, concentrating around the necessity of disciplinary punishment after an accident
1976	Seveso disaster
	The principle that the public prosecutor has the possibilities to not prosecute a case, based on the criterion of public interest and the principle of discretionary power (Code of Criminal Procedure) is taken in a positive way in Dutch legislation
1978	First EU Seveso directive
1988	symposium in the Netherlands around the topic how in future the investigation of aviation accidents should be approached
1992	Rio Declaration on Environment and Development with the formulation of the precautionary principle. This is also the start of the precautionary culture ¹⁴ within environmental protection and in time spreading to other areas
	crash of El Al Boeing in Amsterdam (investigation is being done on the basis of the new legislation, which has been adopted in both houses of Dutch Parliament, i.e. without disciplinary punishment although the previous legislation was still in force)
1993	January 1 st : coming into force of new legislation (Aviation Accident Act) for the investigation of aviation accidents and incidents in the Netherlands, which supersedes the Aviation Disaster Act and is the end of the area with disciplinary power for the Investigation Board for Safety
1994	February: final report of the investigation of the crash of the El Al Boeing is published
1998	October: Start of the Parliamentary Inquiry
	December 10: the Delta case at Schiphol happened and a police investigation started, leading to the prosecution of three persons in Air Traffic Control the Netherlands
1999	April: report of the Parliamentary Inquiry with 22 recommendations for government, amongst which were recommendations about external safety
2000	December: formal charges against three persons in Air Traffic Control the

¹² In the blame culture people had their own responsibility when handling damages and shame and people thought in terms of guilt and individual moral responsibility.

¹³ In the risk culture attention shifts from each individual incident to a level where all incidents with similarities are handled together.

¹⁴ In the precautionary culture moral judgements about incidents is returning and persons and organizations who are responsible for the application of technology are being held responsible for the risks attached to this technology.

	Netherlands for the Delta case
2001	Publication of "Ramp en recht Beschouwingen over rampen, verantwoordelijkheden en aansprakelijkheid" (Disasters and justice Observations regarding disasters, responsibility and liability) several interesting observations about guilt, protection of citizens against hazards and criminal prosecution
	August: first trial of the Delta case (sentenced to a fine; leading to appeal)
2002	September: second trial of the Delta case in the appeal court
	November: verdict of the appeal court in the Delta case (guilty but no punishment)
2003	January: an accident at Rotterdam Airport concerning a tail strike of a Boeing 737, leading to a judicial investigation and a prosecution
2005	Latest amendment of the EU Seveso directive
2008	Report of the "Wetenschappelijke Raad voor het Regeringsbeleid" (Dutch Scientific Council for Government Policy) with the precautionary principle as a new approach towards risk in society
	June: Appeal trial of the tail strike of January 2003
	November: sentence of the appeal trial of the tail strike of January 2003
2009	This thesis.

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What is the Relationship between the increased use of the Penal Code and Safety Reporting

