

**MASTER**

**Distributing moral responsibility  
the case of the Schiphol fire**

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# Distributing Moral Responsibility

## The case of the Schiphol fire

H.Y. Chan



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## Summary

When we try to analyze present-day large disasters, we often stumble upon the problem that we cannot name the people who are legally or morally responsible for the outcome. As it often concerns several actors within one organization, and they all have somehow contributed to the final result, it thus becomes difficult to ascribe responsibility to the right people as all those people are to some extent involved. This problem is called the problem of many hands.

The aim of this research is to provide more insight in the problem of many hands by using the Swiss cheese model of Reason, in order to reach a fair notion of distributing *moral* responsibility that can be applied on the different parties involved. This will be done by means of studying the fire at the Schiphol detention center in October 2005, on which the Dutch Safety Board has conducted an extensive research. By narrowing down all the large accident into smaller events, concrete actions were defined together with the actors involved in these actions. The actors were then tested against fairness criteria after which their moral responsibility could be determined.

The outcome of this research differs from the Dutch Safety Board's analysis in a few aspects. The differences, among other, relate to the question whether someone had the freedom to do otherwise or not. Another discrepancy concerns whether someone knew if he was doing something wrong. While the Board's report sometimes alleges that an actor did not (have to) know in legal terms, he morally spoken *should* have known and can therefore be held accountable.

A second finding is that the Swiss cheese model is able to serve as a means to distribute moral responsibility. By depicting the chronology of an accident, the model can point out when and where mistakes have been made and help to attribute these mistakes to the people who can be held accountable.

A third finding is that moral responsibility can serve as a good basis for determining legal responsibility. The analysis of the Schiphol fire has demonstrated that it is possible to assign moral responsibility to the individual person for the individual act he has committed. By narrowing down the chain of events to separate events, it becomes easier to what happened when and who was involved in the event. The positive upshot of narrowing a big event down to smaller ones is that actors become visible who at first do not seem identifiable; they can easily hide behind the big entity that is called the organization. In practice, usually the actors being the last link in the chain are found culpable for their acts since they have an identity, while the ones in between get away with their mistakes. This research has shown the contrary: the actors who were found morally responsible for their acts were mainly the ones who have made decisions earlier and on a higher levels, whereas the people on the work floor were *not* found responsible for the acts they have committed.

Further research could focus on the organizational culture that plays a role in the determination of moral responsibility. Also, more focus is needed on the question how people should live up to their moral responsibility, as it is an abstract and intangible concept. The final issue that deserves more attention is how must be dealt with the final outcome in which the several parties have a contribution.

## **Preface**

This master thesis is the result of 7 months of work. Anyone who would have told me that I'd be graduating within 6 or 7 months back then I would not have taken seriously. I considered it quite an impossible job since I knew of no one who had succeeded in graduating within such a short time.

However, I have had the luck to have a concrete assignment provided by my supervisor Lambèr, who was doing research on moral responsibility and the problem of many hands. As he explained the problem of many hands to me, I became more and more interested as I find ethics a very interesting field. I had discovered this while taking some philosophy courses during my exchange in Singapore. As the problem of many hands is a well-known problem in organizations, I hoped that on the one hand, I could make a worthy contribution with my thesis in dealing with this issue and on the other hand, show people that ethics does not have to be a boring subject. While writing my master thesis I have grown both professionally and personally.

Besides the luck of a concrete and interesting assignment with which I could immediately start working on, the support of the right people is also necessary for a prosperous course of finishing a master thesis. Hereby I want to thank my supervisors Lambèr Royakkers and Ibo van de Poel for their constructive commentary and the pleasant cooperation. Special thanks go out to Lambèr for pushing me and challenging me to reach my deadline. I also want to thank my fellow graduates Marten, Jacqueline, Wouter and Hind with whom I have had a very nice time working at the university. Many thanks also go out to my best friends Carin and Marc, who always know what to say and how to support me in difficult times. Special acknowledgements go out to Marc, who has taken the time to correct my report both on style and content while he was busy himself. For that I am very grateful. Last but not least I want to thank my boyfriend Mark for just being there, and whom I look very much forward to see again in December.

Hoi-Ying Chan

Eindhoven, August 25<sup>th</sup> 2008

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## List of Abbreviations

<b>Abbreviation</b>	<b>Dutch translation</b>	<b>English translation</b>
BWT	Bouw- en Woningtoezicht	Building and Housing Supervision department
DJI	Dienst Justitiële Inrichtingen	Authority for Judicial Institutions
Kmar	Koninklijke Marechaussee	Royal Marechaussee
PvE	Programma van Eisen	Schedule of Requirements
RGD	Rijksgebouwendienst	Authority for Central Government Buildings
RIE	Risico Inventarisatie en Evaluatie	Risk assessment
RWA	Rook en Warmte Afvoer installatie	Smoke and Heat Exhaust Ventilation System
TNO	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	Netherlands Organization for Applied Scientific Research

## **1. Introduction**

### **1.1 Problem definition**

When we want to analyze present-day large disasters, we often stumble upon the problem that we cannot name the people who are legally or morally responsible for the outcome. Most of the times it concerns several actors within one organization, and they all have somehow contributed to the final result. It thus becomes difficult to ascribe responsibility to the right people as all those people are to some extent involved. Needless to say, this problem, called the problem of many hands (Thompson 1980), becomes even bigger when multiple organizations are involved. The problem of many hands is a well-known problem amongst organizations.

James Reason (1990) has developed a model in the 1990s which is called the Swiss cheese model. It can be used to determine how big disasters are exactly able to take place. Each slice of cheese represents a layer in the defense, through which a hazard (by means of the holes in the cheese) manages to slip through. An accident occurs when all the defense layers are breached. I shall use this model to distribute responsibility among the different layers in a ‘fair’ way. Notions of what can be regarded as ‘fair’ and when someone can be reasonably held responsible can be found in the literature (see, e.g., Van de Poel et al. 2008). Unfortunately, Reason’s model does not tell us who or what exactly these defense layers are. In other words, by means of this model alone we cannot tell who is *morally* responsible for the mistakes made on the different levels.

This is especially a problem in case of a disaster. Accidents can be the result of many coincidences which rarely can be foreseen. Since the ability to foresee unwanted consequences is usually a condition for responsibility, it might turn out that no one can reasonably be held responsible for a disaster (Van de Poel et al. 2008, p. 1). Not only is this morally unsatisfying for victims and surviving relatives, but it may also leave lessons unlearned. Even though sometimes a person is found guilty in practice, it does not necessarily mean that he also bears moral responsibility for the act that he was found guilty for, because “legal responsibility, though suggestive, is not a reliable guide to moral responsibility” (Thompson 1980, p. 905).

The aim is to provide more insight in the problem of many hands by using the model of Reason, in order to reach a fair notion of responsibility distribution that can be applied on the different parties involved. This will be done by means of studying the fire at the Schiphol detention center in October 2005.

### **Research question**

Following from the above, the research question for the thesis would be then:

*“Can James Reason’s Swiss cheese model be used to distribute moral responsibility in a ‘fair’ way among the different parties, and if possible, how?”*

As I have mentioned, ‘fair’ is defined by the compliance with five given conditions. I will go into more detail about these criteria in chapter 5.

## **1.2 Methodology**

The problem of many hands will be studied by means of a concrete case. The case that I have chosen for my thesis is the fire in the Schiphol detention center in the Netherlands in October 2005. Analysis has shown that many parties, mainly government institutions, were involved in this great accident which cost the lives of 11 people. I will study the mistakes that have been made and on what level they have occurred. For this I will make use of available reports on the fire accident.

Next, I will apply Reason's model to the case to find out how the accident was able to take place. I will attempt to classify the formerly mentioned mistakes by means of Reason's error classification. Additionally, I will try to define the various defense layers (that is, the different 'slices of cheese') in my case, on which the mistakes have taken place.

Finally, I shall extend the model with a fair notion of responsibility distribution, since Reason's model does not say anything about responsibility. I will use the literature to determine what exactly can be regarded as 'fair'. By integrating Reason's model, the Schiphol fire case and literature on fairness, I hope to reach a fair way of distributing responsibilities as a lesson for the future.

The remainder of the report is structured as follows. In chapter 2 covers James Reason's Swiss cheese model. Chapter 3 will treat the chosen case for my analysis. The application of the model onto the case is dealt with in chapter 4. Chapter 5 will continue on the incorporation of the Swiss cheese model into the Schiphol fire case and add a notion of moral responsibility to it. Chapter 6 shall present the conclusion and the discussion for future research.

## **2. James Reason's 'Swiss cheese' model of risk management**

### **2.1 Approaches to error management**

Reason has identified two important approaches to managing errors: the *person approach* and the *system approach* (Reason 1997, Reason 2000). We shall explain the two concepts briefly below.

According to the person approach, unsafe acts originate from unusual mental processes such as forgetfulness, inattention, poor motivation, carelessness, negligence and recklessness (Reason 2000). Focus is placed on the errors made by individuals, who are made subjected to blame or shame for the formerly mentioned weaknesses. So followers of this approach treat errors as a moral issue.

Unlike the person approach, the system approach (formerly known as the engineering model combined with the organizational model, see Reason 1997, pp. 225-226) does not regard humans being responsible for errors made. Instead, it is presumed that humans are fallible and that errors are to be expected. The origin of the error does not concern human nature. It is more a consequence rather than a cause. This approach is based on a recurring theme of Reason: "We cannot change human condition, but we can change the conditions under which humans work" (Reason 1997, p. 25). This can be done by bringing in system defenses, so that when an adverse event occurs, it does not matter whose fault it was, but how and why defenses failed.

However, in practice it appears that blaming individuals is emotionally more satisfying than targeting abstract institutions. It is one of the reasons why it is the dominant approach. However, the person approach has some weaknesses. For one, effective risk management requires that people report mistakes and the like, which does not always take place. Only this way people can learn from incidents. Second, by focusing on individual origins of error, it separates unsafe acts from their system context. Because of this, one easily fails to notice that the best people can make the worst mistakes. Moreover, the same circumstances can create similar errors in the future, regardless of who is involved. As was said before, it is important that we change the conditions in which humans work, not the human condition itself.

### **2.2 The 'Swiss cheese' model**

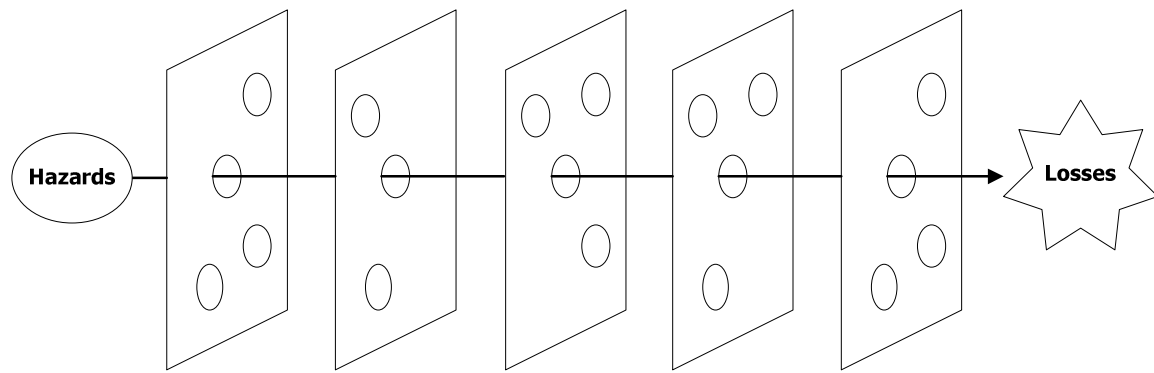
Reason's 'Swiss cheese' model (Reason 1998, Reason 2000) is a well-known model for explaining how safety incidents with humans or machines occur. The organization is represented by a piece of Swiss cheese cut into different slices (see Figure 1). Each slice represents a layer of defense in the organization. Ideally spoken, each layer would be intact. However, in reality, a defense layer has holes or gaps. These holes are caused by two things; the so-called *active failures* and *latent conditions* (Reason 1990). Reason used to call the latter *latent errors*, but the meaning is the same.

Active failures occur when humans make mistakes that involve direct contact with a system or a patient and their effects are felt immediately. Active failures are short-lived of nature. They are caused by errors such as slips, lapses, mistakes and procedural violations. Let us first explain what errors are and which types of errors exist.

Basically, an *error* encompasses 'all those occasions in which a planned sequence of mental or physical activities fails to achieve its intended outcome, and when these

failures cannot be attributed to the intervention of some chance agency' (Reason 1990). Different types of errors have been classified. Reason (1990) makes two distinctions. The first one is between prior intention and intentional action, the second between intended and unintended actions. Let us focus on the second distinction. An unintended action is one that had a prior intention, but an accompanying action that did not go as planned. An intended action proceeds as planned, but it is still possible that it does not achieve the outcome intended. Thus, it can also be counted as an error. A third distinction can be made here, between slips (or lapses) and mistakes. Slips and lapses occur when the *intention* for the action is correct, except the *action* does not go as planned. Whether or not the desired outcome is achieved is besides the point. A mistake occurs when the desired outcome becomes an issue: both the *intention* for the action and the *action* itself proceed correctly, but the desired outcome is not achieved (Norman 1983). Whereas the term *slips* is used for possibly observable actions-not-as-planned (e.g. slips of the tongue or pen), *lapses* involve more invisible errors like memory loss that may only be apparent to the person experiencing them (Reason 1990). Slips, lapses and mistakes are considered basic error types. There is a fourth error type which is different from the other three, namely *violation*. Whereas errors are more related to the cognitive processes of the individual, violation involves the social context in which behavior is governed by procedures, codes of practice and rules. In brief, violations are deliberate deviations from those practices which are deemed necessary to maintain safety (Reason 1990). Because it is quite obvious in these cases where or with whom the cause of the accident lies, followers of the person approach stop looking further once the actor in question is identified.

In contrast with the active failures, latent conditions with their adverse consequences may lie dormant for years without going noticed. They only become evident when combined with other factors breaching the system's defenses (Rasmussen and Pedersen, 1984). Moreover, these gaps are not static (like real Swiss cheese holes) but dynamic of nature; dependent on the circumstances, they open, shut and move around continuously. For this reason, they are harder to detect and occur less frequently than active failures (Reason 2000). Latent conditions have two kinds of negative effects: they can either become error provoking conditions within the local workplace, or create long-lasting holes (e.g. maintenance failures, untrustworthy alarms, unworkable procedures, fatigue, inexperience). The deeper a hazard manages to penetrate the system's defense layers, the greater the damage is in the end.



*Some holes are due to active failures, other are due to latent conditions*

*Figure 1: James Reason's Swiss cheese mode, adapted from Reason 1998*

It is important to stress that the difference between active failures and latent conditions lies with two organizational factors. The first concerns the issue of *time*. Whereas the former are relatively short-lived and have immediate effects, the latter can lie around for a long time without doing immediate harm. The second concerns the location of the human instigators within the organization. While the active failures involve personnel that have hands on contact with the system, latent conditions arise within the upper levels of the organization.

As is said before, active failures and latent conditions cause these holes in the slices of cheese. These holes represent the weaknesses in a system. In principle, the presence of these holes does not need to cause a bad outcome. An accident happens when the holes in several layers line up, creating a so-called 'trajectory of accident opportunity' (Reason 2000, p. 769).

### **2.3 The Swiss cheese model in practice**

James Reason's original model has been developed over the years, by various sources. It has been further developed for example by Shappell and Wiegmann (2000) for analyzing accidents in the aviation industry. Their model is called the Human Factors Analysis and Classification System. A second field in which the model is used is the one of health care. Reason's model is also used as a basis for the software tools of Tripod Solutions (on which Reason himself has cooperated), with which one can categorize hazards, accidents and failure types. Nevertheless, I will try to stick to the model by Reason as much as possible. Although Reason has never explicitly stated what the different slices in his Swiss cheese model exactly represent, he does explain how the causation of an accident looks like. According to Reason (1997), accidents happen according the trajectory depicted in the figure below:

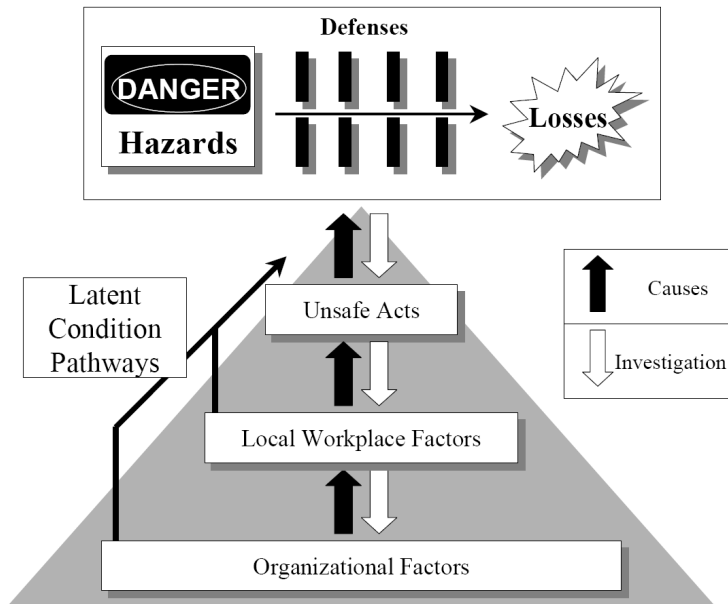


Figure 2: Stages in the development of an organizational accident (Reason 1997)

The rectangular block at the top represents the main elements of an accident. The triangle below depicts the system producing the accident. The system consists of 3 layers: the organization, the workplace (error-provoking conditions) and the person (unsafe acts). In short, it implies that on the highest level of an organization, you find factors like strategic decisions, organizational climate, resource allocation, planning and communication (Reason 1997, Shappell and Wiegmann 2000). These processes are colored and shaped by some sort of corporate culture or unwritten rules that exist within the organization. The consequences of these activities will manifest themselves on the local workplace (like control rooms, maintenance facilities and other subdivisions of an organization) in the form of conditions provoking unsafe acts. Such conditions can be time pressure, inadequate equipment, insufficient training of personnel, under-manning, unworkable procedures, poor communication, etc. Within the local workplace, there are opportunities for unsafe acts to take place. It is a natural tendency for humans to make mistakes. If you combine this fact with the local workplace factors that produce preconditions for unsafe acts, then unsafe acts can occur, leading to an accident. An accident is usually, but not always caused by an unsafe act (i.e. an active failure).

## 2.4 High-tech systems can be more risky

By means of using the Swiss cheese metaphor Reason aims to explain why complex technological systems are especially susceptible to risk of accident, sometimes with tremendous consequences. In such systems often a so-called ‘defense-in-depth’ structure can be found. In brief, a ‘defense-in-depth’ basically entails that systems have multiple lines of defense, such as protective functions, barriers against fault propagation and other safety measures which can serve to terminate an accidental chain of event before serious damage is done. Additionally, there is special equipment installed to take over in case systems fail (Rasmussen 1993). Nevertheless, the paradox is that though such well-

defended systems greatly reduce the chance of an accident and make it rare for it to happen, they also create what Reason calls 'system opacity' to human operators. This means that human controllers become literally distanced from their systems; as such systems have become highly automated over the years, human controllers have gotten a more supervisory role rather than have 'hands on' contact with the system itself (Rasmussen 1988). In addition, not only do controllers of the system become distanced from the machine they operate, people are also having a hard time understanding the system because of its complexity. (Perrow 1984). Not a single individual is capable of understanding the system in its entirety, which makes that no one is responsible for the whole system. If no one is aware of all the security holes in the system, no one can be fully responsible for them.

'Defense-in-depth' systems often do not react immediately to single faults. As Rasmussen (1988) says: 'Consequently, many errors and faults made by the staff and maintenance personnel do not directly reveal themselves by functional response from the system. Humans can operate with an extremely high level of reliability in a dynamic environment when slips and mistakes have immediately visible effects and can be corrected. Survival when driving through Paris during rush hours depends on this fact.' (Rasmussen 1988, pp. 3-4). Hence, not only are errors ignored, but they are also left behind in the system's defense layers. Such errors show up when they coincide with other errors, which increases the chances of an accident (Rasmussen 1988).



### **3. The Schiphol fire case**

This chapter describes the Schiphol fire accident of October 27<sup>th</sup> 2005. On the night of October 26<sup>th</sup> and 27<sup>th</sup>, a major fire occurred at the Schiphol detention center, resulting in the death of 11 prisoners.

The summary below is mainly based on the investigation run by the Dutch Safety Board. For detailed facts I have used the report ‘Brand Cellencomplex Schiphol-Oost’ by the Dutch Safety Board (2006, henceforth the Board).

I will limit myself mainly to the fire development and the immediate rescue of the prisoners, and not so much on the aid and assistance (for the prisoners) afterwards. The reason for this is that I want to put emphasis on *how (it was possible that) the 11 prisoners (could) have died*, that is, what exactly *caused* this result. The questions on how the survivors were taken care of afterwards, and how the fire was extinguished after as many people as possible were brought into safety, are left out of consideration, since the answer to these questions do not contribute to our knowledge of the causation of the deaths of the prisoners.

#### **3.1 Background information on the detention center**

Below I shall briefly explain some background facts on the detention center of Schiphol. A representation of the penitentiary is given in Figure 3 below.

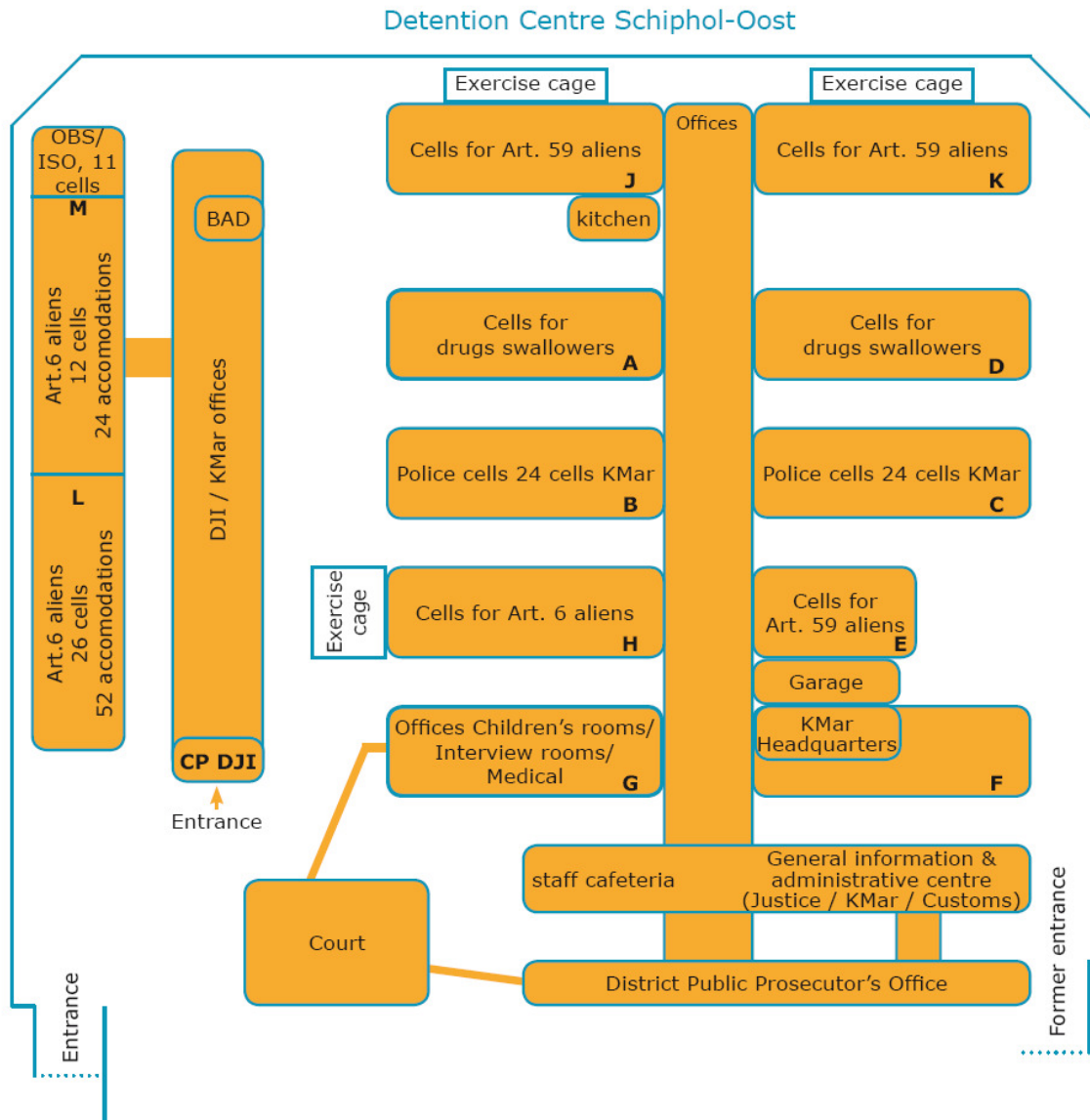


Figure 3: Overview of the Schiphol detention center (Onderzoeksraad voor Veiligheid 2006, p. 20)

### Purpose and characteristics of the detention center

Since the 1990s, Schiphol airport has been dealing with illegal import of drugs, hidden in freight and transported by couriers. However, due to shortage of prison cells and personnel, suspects of drugs smuggling were often set free. To rectify this situation a new detention center was established to accommodate people who were guilty of drugs smuggling. At the time of the fire, the detention center was used for ordinary police tasks, for the incarceration of balloon swallows and the temporary detainment of illegal aliens.

In contrast with non-penitentiary buildings, the Schiphol detention center contains a rather high risk profile with respect to fire safety:

- It must be able to accommodate a large number of people (at least 400).

- The prisoners are, in case of fire, dependent of the building's characteristics, the acts of its prison guards and the available aids and resources in order to reach safety.
- Prisoners are not allowed to be able to leave their residence independently. At the same time, members of the rescue team must be able to enter the building and its rooms without any problems in case of emergency.

So on the one hand, it must be ensured that the occupants are imprisoned, but on the other hand, rescue team staff members and other people must be able to reach and evacuate the place quickly when needed.

### **Organization and personnel**

The Schiphol detention center is under supervision of the Ministry of Justice's department Authority for Judicial Institutions (Dienst Justitiële Inrichtingen, hereafter called DJI). About 140 employees are active in the penitentiary, of which 100 are from DJI and 40 from the external company Securicor. Next to the regular crew there are also employees of the Royal Marechaussee (Koninklijke Marechaussee, henceforth KMar) deployed in the penitentiary. On the night of the fire, 16 employees were at work, namely 7 from DJI, 2 from Securicor, 6 from KMar, and 1 from the penitentiary's infirmary.

The penitentiary has two central posts, namely the KMar central post and the DJI central post. Both posts are manned at all times with someone from the penitentiary. On top of that, there is a team post in every wing, consisting of each 2 guards. Exception to the rule are the wings J and K which are unmanned due to efficiency matters.

Fire alarms that go off are being directed to the team post of the concerning wing and to the KMar central post. If an alarm goes off in the J or the K wing, it will be noticed by the KMar central post (the DJI central post is also immediately notified). Notifying the fire department takes place in two different ways. If an alarm goes off in wing B, then it is the task of the KMar central post to alarm the fire department. However, if it goes off in any other wing, then the DJI central post is expected to take care of it.

## **3.2 The course of events**

### **3.2.1 Initial incendiarism and internal alarm**

On the evening of October 26<sup>th</sup> 2005, all 298 prisoners of the Schiphol detention center were in their cells. Most of the cells in wing K were inhabited by two occupants each. Cell 11 was an exception: it was occupied by just one person. At 11:55 PM, the smoke detector registered a fire in wing K. About a minute later, the occupant of cell 11 pressed the attention button on the intercom. Smoke could be seen passing through the chinks of the door of cell 11 almost at the same time.

The moment the fire was signalled by the fire detector, a fire alarm was sent to the two central posts KMar and DJI. The accompanying alarm code '5002' corresponded with the K wing. At the DJI central post, there was a note saying that '5002' in practice usually originates from the D wing, though it also refers to the K wing. Therefore, the guards staffed at the DJI post, interpreted the code as coming from the D wing. After they

went to check up in the D wing, they detected no fire and passed the message that there was no problem there. This led to the result that the DJI central post assumed it was a false alarm and decided to notify the fire department of its findings in order to prevent the fire department from showing up for nothing.

At the Kmar central post however, the alarm code was interpreted as originating from the K wing. The attending staff member consequently set the 3-minute timer before the fire message would automatically be passed through to the emergency control room of Schiphol (Regiecentrum Schiphol), which organizes the initial fire control. These 3 minutes are a safety measure to allow employees to determine whether there really is a fire or not. Thus, the commander at the KMar central post sent other guards to the K wing, who indeed confirmed the presence of a fire. Finally, almost 2 minutes after the fire alarm was set off, all guards in the detention center were informed about the presence and the location of the fire after which the rescue of the prisoners started.

### 3.2.2 Rescue of occupant of cell 11 and other K wing occupants

By the time the guards reached cell 11, a good 2 minutes had expired. The occupant fell through the doorway when the guards opened the door. Also, smoke was coming out of his hair and he had burns on his arms, hands, and heel.

After freeing the occupant of cell 11, the guards left the door of the cell open, assuming that someone might still be inside. In a testimony, one of the guards declared that it was not clear how many people were residing in the cell. The moment the cell door was opened, a wave of smoke spread along the ceiling into the direction of the wing's entrance door. The shutters of the system that was supposed to divert smoke and heat (Rook en Warmte Afvoer installatie, RWA for short) remained closed. Hence, the smoke that was still spreading could not be stopped. The DJI commander, who had arrived at the K wing, saw that the smoke and heat was not carried off by the RWA system and opened the emergency exit himself from the outside. This led to flames were coming out of the emergency exit, which resulted in the blocking of immediate access to the K wing.

The guards started rescuing other occupants of the same wing 3 minutes after the fire alarm was activated and approximately 1 minute after the occupant of cell 11 was rescued. They started opening the cells on the opposite side of where the smoke was coming from. By the time they reached cells 8 and 15, both within the proximity of 8 meters from cell 11, the smoke and the heat had become so intense that the guards were forced to retreat. Cells 9, 10, 12, 13 and 14 (all at the end of the corridor) were left unopened (see Figure 4). In the end, the guards managed to free 31 prisoners from the K wing. Another attempt to evacuate people was unsuccessful. At a certain moment, everyone was called back. Not long after the last person left the wing, an explosive combustion took place in the form of a major flash, reaching alongside the entire length of the corridor. A reconstruction has shown that the accumulation of the flue gases most probably has led to the explosive combustion.

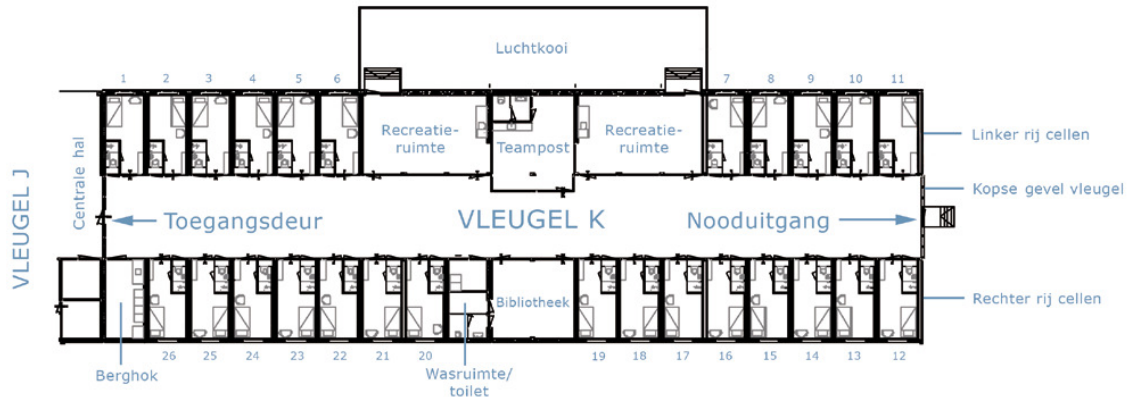


Figure 4: Map of the K wing (Onderzoeksraad voor Veiligheid 2006, p. 21)

### 3.2.3 Organization of emergency services

After a few phone calls to the emergency control room of Schiphol were made (which led to some initial confusion on whether or not there was a fire) and the confirmation of the fire after the 3 minutes had passed, the surrounding fire stations were alarmed. The fire was now interpreted as a ‘large fire’ and resources were scaled up.

Around 00:09 AM, the first fire truck arrived at the old entrance of the detention center (see Figure 3). The KMar central post opened the first gate for the fire truck, after which it could enter. However, the second gate was locked with a chain lock. A detention staff member quickly tried to lead the fire brigade to the correct entrance, which was the main entrance. In the meantime, other vehicles had accumulated at the old entrance, which meant that they were all blocking the fire trucks trying to get out in order to get to the right entrance. After a while, the fire trucks reached the main entrance. This entrance worked according to the same sluice mechanism as the old entrance did – the second gate can only be opened after the first one is closed. In addition, while the vehicles were in between the two gates, a just arriving ambulance joined the queue and blocked the activation of the sluice door. Thus, the second gate could not be opened, because the first gate could not be closed. At 00:15 AM, the first two fire trucks managed to get onto the terrain. Once inside, the crew of the first two trucks asked a KMar staff member to open both gates for the other vehicles. The KMar staff member declared that this was not possible.

The first fire truck went to the J wing instead of the K wing, because there was too much smoke and fire coming of the K wing. The commanding officer of this truck was familiar with the building and explored the situation. He said that the prisoners were put in the air cage next to the J wing.

The first officer of the municipal fire brigade, who sat in the second vehicle arriving on the terrain, tried to find a staff member who could give him more information on potential victims. Unfortunately, he did not find one. After some deliberation with the commanding officer of the first fire truck, they charged the building with a ‘rescue’ purpose.

The intention was to enter the building through the emergency exit of the J wing, but this door was locked. Both staff members on the inside and on the outside were not able

to open the emergency exit. By approximately 00:20 AM, the emergency exit door was forced open and the first troop was sent in. Once inside, the commander of the first truck ordered to evacuate the J wing as it was getting too hot and there was too much smoke (the first officer of the municipal fire department remained outside).

A second fire brigade unit arrived at about 00:15 AM at the old entrance, which was still locked with a chain lock. However, no staff members were there anymore to direct the brigade unit to the correct entrance, so they broke the lock open and entered the area.

### 3.2.4 Death of the victims

As was said before, all cells in the K wing were opened except for the cells 9, 10, 12, 13 and 14. All prisoners were brought into safety except the ones from 5, 9, 10, 12, 13 and 14 (cell 5 was opened, but the occupant did not survive).

The Board of Investigation has made an attempt to reconstruct the situation in which the victims most likely have died. The autopsy has shown that all victims have died from carbon monoxide poison. The reconstruction showed that when the smoke moved from cell 11 to the rest of the corridor, substantial amounts of smoke must have been penetrating the other cells for about 5 minutes. The victims from the 10 unopened cells died somewhere between 00:10 AM and 00:30 AM. However, the occupant from cell 5 most likely died somewhat later, as his cell was located further away from the fire. His body was found by the fire brigade around 1:15 AM.

## 3.3 Analysis of the fire

### 3.3.1 Crucial elements in the fire development

There have been certain moments that can be marked as crucial events in the Schiphol fire incident. They are listed below and their role is analyzed in the light of further fire development.

#### **Origin of the fire**

One fact that is beyond any doubt is that the fire started in cell 11 of the K wing. The testimonies that the guards have given, correspond with security cameras. The prisoner from cell 11 was saved by the guards by 11:57 PM. However, it was not possible for the Board to determine what exactly happened before that. The Board has drawn up three scenarios that could possibly have led to the fire:

1. Fire due to an accidental cause
2. Fire due to setting inflammable material alight
3. Fire due to a technical cause

After investigation, the Board concluded that a fire due to a technical cause was out of the question. Nevertheless, it is important to mention that it was not possible to determine an unambiguous cause by means of true to life experiments. It is possible that a thrown away cigarette has caused the fire.

### **Leaving cell door 11 open**

Leaving the door open has led to the further development of the fire. Namely, if the door would have remained closed, no more oxygen could reach the fire and the fire would not have gotten the chance to develop the way it did that night.

The fact that the door has been opened and not been closed after that, about 2 minutes after the fire alarm, has played a crucial role in the development of the fire. The situation escalated to the extent that enough conditions were formed to create a flashover. A flashover is a phenomenon in which incombusted flue gases accumulate and reach a temperature high enough for a combustion to take place.

### **Increase of the amount smoke in the corridor**

The flashover did not only accelerate the fire development, but also produced more smoke. In addition, the smoke had become highly toxic because of incombusted flue gases. Therefore, rescuing the occupants of the K wing was an extremely dangerous thing to do in the first place.

One of the things that may have contributed to the smoke development was the fact that the smoke and heat diverter was not working, for a number of technical reasons. Moreover, there was no documentation of regular maintenance since its installation, while this has to be done once a year. The smoke and heat diverter would not have been powerful enough (given the dimensions of the corridor) to divert all the smoke; if it would have worked, it would have at least diverted some part of the smoke, and thus have given the guards time to rescue more prisoners.

### **Fire and smoke resistance of the cells**

The cells in the K wing were not very fire resistant. This fire resistance is expressed in the amount of kgs of pinewood per m<sup>2</sup>. According to the norm (Brandbeveiligingsconcept Cellen en Celgebouwen 1994, p. 82) that is applied for fire safety, which is 5-20 kgs of pinewood per m<sup>2</sup>, the cells were supplied with approximately 140 kgs of inflammable material per m<sup>2</sup>, a far greater amount than this norm prescribes. Tests have shown what kind of influence the interior of the cell must have had on the quick fire development.

Moreover, tests have shown that the cells could not offer much protection to their occupants. Smoke was penetrating the cell through doors, windows, and the like within a short time.

### **Geometry of the building**

The detention center is built so that containers form the basis of the building. Besides that, an extra shell is built around these containers (see Figure 5). This construction has contributed to the fire in the corridor.

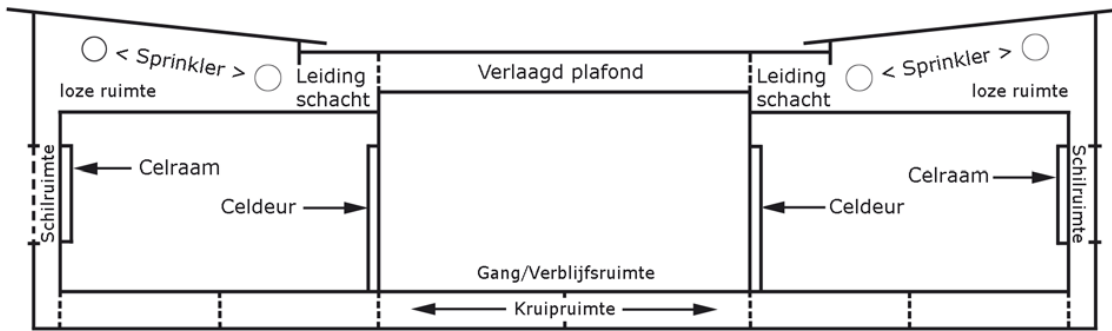


Figure 5: Cross section of the cell container (Onderzoeksraad voor Veiligheid 2006, p. 21)

### 3.3.2 Involved parties and their responsibilities

Below you find a summary of the Board opinion on how different parties should have acted and who is responsible for what given the situation. I would like to stress explicitly that these are the conclusions of the Board itself.

#### **Performance by the organization and its personnel**

In order to analyze the acts by the personnel, the Board has posed as main question: *how was it possible that cell door 11 was left open by the guards (who were involved in the fire)?* Different sources confirm the importance of closing a cell door, e.g. to prevent oxygen from reaching the fire so the fire does not expand, and so the fire and the smoke cannot reach other rooms. It is also important because other cells can be evacuated and the fire can be controlled, for instance.

There is no unambiguous answer as to why the guards have not closed the door or what the guards were exactly thinking. Nevertheless, it is possible to map the conditions in which the guards did their daily activities. The Board has come up with the following causes:

#### 1. *Insufficient knowledge and skills*

Firstly, guards should be familiar with the procedure of closing the door after a prisoner is rescued out of his cell in case of fire. Secondly, it is of importance that they have had exercises with this procedure. Both were not the case. Three factors have contributed to this result. For one, the staff was not sufficiently trained in carrying out this act. It has been taught in theory, but has not been practiced a lot. Second, there is a lot of switching of personnel within the detention center, while the training, in which prisoners have to be evacuated, is only held once a year. The guards who opened cell door 11 were employed after this training was held, so they knew nothing about this procedure. Finally, the staff was not familiar with other emergency procedures. An emergency plan was present, but this plan has never been exercised before or even discussed.

#### 2. *Shortcomings in the safety organization*



Insufficient priority was given to fire safety, e.g. there was no inventory of risks and not enough supervision on how the staff was trained. Next, there was too little assessment on the effectivity of the training program. Also, the management of the detention center did not anticipate a big fire.

3. *Insufficient supervision*

Supervising organizations, viz. the Ministry of Justice, the municipality, the Inspection of Sanction Application (Inspectie voor Sanctietoepassing), the internal supervising committee (interne commissie van toezicht), and the labor inspection, should have supervised the detention center more.

4. *Incomplete information on the occupants*

At the moment of the fire, there was no information on how many people were residing in each cell. Nameplates next to the door did not contain any names because occupants were switching very often. Besides that, the staff members were doing shift work. Therefore it is imaginable that the guards in question were not sure on how many people were in the cell and therefore have not closed the door.

5. *Lack of surveillance at night in the K wing*

The K wing did not have night surveillance due to efficiency issues. This has slowed down the internal organization after the fire alarm. Notwithstanding the fact that the guards have reached the cell within the time set by the norm after the alarm, the Board is of the opinion that more could have been done if guards were patrolling on site.

**Performance by the fire department**

The performance by the fire department is mainly analyzed in the light of time that was lost while the fire brigade made its way to the detention center, since time loss had influence of the rescue mission. The exact influence is hard to tell. However, the Board wants to name some factors that have had an influence on the delay:

1. The fire brigade was alarmed with a delay.
2. The fire brigade took long before showing up.
3. The fire brigade arrived at the wrong entrance, and had to make a detour.
4. The fire brigade was not adequately awaited for by staff members of the detention center.

One of the most important causes can be found at the detention center. Namely, the fire alarm equipment contains a delay of 3 minutes. However, the fire department was not informed about it and was thus not aware of this delay. It was claimed that it was a criterion set by the building permit, but disagreement exists on this matter. The risk of

delay time was not acknowledged as well, even after some signals (like smaller fires) were there.

Another cause is the lack of information on the situation when the fire happened. For instance, the staff was not adequately prepared, the fire department was not acquainted with the new situation, the organization was focusing too much on the daily course of business and there was no joint exercise.

The Haarlemmermeer municipality has played a role in the ultimate corollary as well. The rescue by the fire department was organized in such a way that the detention center could not be reached in time. The site manager of the detention center did not know this. However, the municipality did not pay further attention to the increased risk of this situation.

The Board wants to note that not one but several norms exist for the time needed to organize the rescue by the fire department. For example, the guidelines for the fire safety of cells and cell buildings (Brandbeveiligingsconcept Cellen en Celgebouwen 1994) assume that the occupants are able to look after themselves to a certain extent. The Board does not express a preference for a certain norm, but notices a gap when the situation is beyond someone's ability to cope and the fire brigade is not on site yet. As a side note: as almost all the victims most likely died before 00:30 AM, it is doubtful that the fire brigade could have rescued them when their operation started.

### **3.4 Analysis of responsibilities with regard to construction and use**

The Board has listed a number of parties that are in one way or another involved in the fire in the detention center. These are:

- The Ministry of Justice
- The Ministry of Housing, Spatial Planning and Environment
- The Ministry of Interior and Kingdom Relations
- The Ministry of Defense and the Royal Marechaussee
- The municipality of Haarlemmermeer
- Various inspections

Although the Board does not want to place a judgment on who is to praise and who is to blame, they would like to elaborate on the responsibilities of the various parties involved as much as possible to learn from them so these learning experiences can be used in the future.

Beside the people who were involved in the fire incident, there are also institutions who were involved in the construction and use of the detention center. These are the following:

- Authority for Judicial Institutions
- Authority for Central Government Buildings
- Municipality of Haarlemmermeer

### 3.4.1 Authority for Judicial Institutions

The Authority for Judicial Institutions (Dienst Justitiële Inrichtingen, henceforth DJI) is a subdivision of the Ministry of Justice (Ministerie van Justitie). It is a government body with the authority to penalize people (by means of putting them away), and to take necessary measures so as to make society safer.<sup>1</sup> When a penitentiary is built, DJI is seen as the initiator by RGD. The DJI site manager of the detention center is responsible for the daily administration of the penitentiary. His job is also to comply with the rules set in the Act for Working Conditions (Arbeidsomstandighedenwet) and to ensure that the safety and the health of the staff and the prisoners are safeguarded.

Both the detention center's DJI site manager and DJI's general management have not adequately lived up to their responsibilities with respect to fire safety. The Board mentions the following arguments:

1. The accompanying risks of putting away approximately 400 prisoners has not been kept in mind, e.g. concerns about their ability to cope for themselves in case of emergency.
2. The emergency plans in theory did not correspond with the execution of it in reality. What is described in those plans must in practice be reasonably executable by the staff. For instance, it cannot reasonably be expected from the guards to close off a room on fire at all times, certainly not in stressful situations and without sufficient training.
3. No additional measures have been taken to compensate for the limitations that resulted from the discrepancies between the building plan and the building that has been realized.
4. There was no sound argumentation for the choice of non-selfclosing doors (which normally is the case in public buildings).
5. The basic rule that two guards are present in each wing was not complied with.
6. The general management did not have a clear fire safety policy.
7. DJI has not constructed a List of Requirements for the construction of the wings J and K.
8. Since the J and the K wing have been built, there have not been regular trainings with the entire personnel (that is, more than just once a year). Given the risky character of the penitentiary, this could have been expected from DJI.

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<sup>1</sup> <http://www.dji.nl/main.asp?pid=1&aid=29>, <http://www.dji.nl/main.asp?pid=14>

### 3.4.2 Authority for Central Government Buildings

The Authority for Central Government Buildings (Rijksgebouwendienst, from now on RGD) is a subdivision of the Ministry of Housing, Spatial Planning and Environment (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, VROM for short). It is an institution that realizes buildings for public services. Most penitentiaries are built by RGD and are under its administration. Notwithstanding the fact that DJI has the final responsibility for the safety of its occupants, the Board deems that it is appropriate to expect from RGD to have them deliver a fire safe penitentiary in accordance with the legislation. It may be expected from them to develop a sound building plan. Just like with DJI, the Board blames RGD for not considering the risks involved when about 400 people are put away. These risks have also not been communicated to the user (DJI in this case) as a means of ‘guide’ for the use of the building. With regard to the (insufficient) measures taken to ensure fire safety, the Board mentions the following reasons:

1. The interior of the cell are not fire resistant enough according to the municipal norm (Weerstand tegen Branddoorslag en Brandoverslag), which demands at least 20 minutes of resistance.
2. RGD has wrongfully thought that surviving the TNO fire safety test for cell containers implied that the whole wing would be fire proof.
3. RGD has insufficiently compensated for the characteristics in the building plan that deviate from the legislation.

The RGD has omitted to do the following as well:

4. Both the J and the K wing did not comply with the construction legislation with respect to fire safety.
5. The implemented smoke and heat diverter was inadequate for the length of the corridor. To be precise, its capacity was 3 times as low as it was supposed to be (in this case). Moreover, it did not even work during the fire.
6. RGD has not made enough use of earlier research and information on fire safety regarding the detention center. Also, if measures had been implemented, it could have prevented or limited the consequences of the fire.
7. RGD has not verified whether its contractors actually complied with fire safety requirements.

### 3.4.3 Municipality of Haarlemmermeer

The building permit and the occupancy permit of the penitentiary are provided by the Haarlemmermeer municipality. The Board has yet again examined whether this party has appropriately carried out its task concerning these two permits.

With regard to the building permit, it has appeared that the necessary documentation for the application was rather succinct. In addition, the grant of the building permit was not based on a complete test. Moreover, at the time of granting the permit, the Haarlemmermeer fire department did not possess enough up-to-date knowledge on fire safety regulations and the risks of the characteristics of the Schiphol detention center in particular. Finally, just like RGD, the municipality has not consulted the available information and research on fire safety.

The occupancy permit is a document in which is decided whether a building is fire proof or not. The municipality of Haarlemmermeer has laid down this task at its fire department. Regarding this type of permit, the municipality has failed to carry out some necessary measures. First, the fire department has granted the permit on the basis of certain documents without having assessed them first. Second, and more importantly, the permit was granted while the conditions for the preceding building permit had not even been met. The occupancy permit usually follows on the building permit when all conditions for the latter are fulfilled. Additionally, the application for the permit was not even filled out completely. In general it can be said that the municipality's supervision on the occupancy permit was rather limited. It has mainly focused on shortcomings that were only visible on the outside. The fire department has not checked whether the necessary documents (certificates and such) regarding fire safety measures were present, or whether they were relevant for that matter.

Overall, it can be stated that the municipality has not sufficiently supervised the construction of the penitentiary. There is little documentation on the way tests have been conducted and the depth of the tests.

## 3.5 The Board's conclusion

From the research that the Board has conducted, it has become clear that the Board holds three parties in particular responsible for the Schiphol fire incident:

1. *Dienst Justitiële Inrichtingen (DJI)*  
DJI is responsible for a List of Requirements and is the end user of the penitentiary and therefore holds responsibility for its occupants. Its Company Aid Assistance (Bedrijfshulpverlening) should have been more considerate and prepared.
2. *Rijksgebouwendienst (RGD)*  
RGD is responsible for the construction of the detention center and is its property owner.

3. *Municipality of Haarlemmermeer*

The municipality is responsible for granting permits for the construction and the use of the penitentiary, for supervision and maintenance of the building, and for the fire department.

The overall conclusion is that the various parties have not adequately lived up to their responsibilities. Moreover, their mutual responsibilities have not been adjusted to one another. As a result of many parties sharing the same responsibilities, the parties are relying on each other for expertise. In addition, parties do not take their own responsibility or they downplay it. Therefore, risks are not recognized and alternative solutions are insufficiently assessed. These findings raise concerns, because of all parties, the government should set an example regarding safety at work and compliance with legislation and rules all the more.

### **3.6 Political aftermath**

The publication of the Schiphol fire report on September 21<sup>st</sup> 2006 has caused a lot of commotion within the cabinet. It has had a number of political consequences. For instance, in September 2006, the Minister of Justice (P.H. Donner) and the Minister of Housing, Spatial Planning and Environment (S. Dekker) resigned from office.<sup>2</sup> Dekker and Donner shared the opinion that a minister is liable for the malfunctioning of his civil service, whether he was personally responsible for the result or not. Besides, Dekker also thought that he could not stay since he was regarded as the person responsible by the victims and their surviving relatives.<sup>3</sup> After the publication, the mayor of the municipality Haarlemmermeer immediately offered his resignation as well. He said not to feel personally responsible for the events that have taken place, yet he felt politically responsible.<sup>4</sup>

In October 2007, the Supreme Court in the Netherlands decided that the ex-minister of Justice (P.H. Donner) and the ex-minister of Immigration and Integration (R. Verdonk) would not be persecuted for their crimes.<sup>5</sup> They were summoned to court on behalf of 30 citizens. The matters that Donner stood trial for concerned 1) neglect to comply with building and fire proof regulations during the construction, 2) the lack of adequately trained personnel in the penitentiary, and 3) shortcomings with respect to the rescue of the prisoners and the immediate aid during the fire. Furthermore, prosecutors have deemed Verdonk responsible for the fact that the immigrants were kept prison and put in poor detention circumstances while they were waiting for a final decision on whether they could stay in the country. Nevertheless, the Supreme Court reached the conclusion that government administrators could not be prosecuted just like that; only the government and the parliament have this authority.

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<sup>2</sup> <http://www.vrom.nl/pagina.html?id=24504>  
[http://www.justitie.nl/images/1158852427\\_tcm34-19996.pdf](http://www.justitie.nl/images/1158852427_tcm34-19996.pdf)

<sup>3</sup> <http://www.justitie.nl/actueel/nieuwsberichten/archief-2006/Minister-Donner-biedt-ontslag-aan.aspx>

<sup>4</sup>

<http://www.haarlemmermeer.nl/dsc?c=getobject&s=obj&!sessionid=19vhsY1yp3M4aGBFhXOqKEX@IWdpDcXH5!f8xG1nmb5!BNDacGa19bs1WzcV!js3&objectid=25579&!dsname=hmminter&isapidir=/gvisapi/>

<sup>5</sup> <http://www.rechtspraak.nl/ljn.asp?ljn= BA8454>

With regard to the fire starter, the occupant of cell 11 (a 25 years old Libyan), was convicted for starting the fire and was sentenced to 3 years in jail in June 2007.<sup>6</sup> The court reached the conclusion that the fire must have originated on the bed after the accused threw away his cigarette. A technical cause for the fire was out of the question. Although the accused did not start the fire with malice aforethought, but by doing what he did, he had accepted the risk of starting a fire. Also, he is held jointly responsible for the death of the 11 occupants of the penitentiary. Albeit he has not intended for the consequences of the fire to develop as they did, the court says that it was reasonable to foresee that there would be casualties, in the case where people are locked up and cannot free themselves. The fact that there have been shortcomings in the rescue and in the aid have not reduced the degree of his responsibility. It is nevertheless not fair to hold just one person responsible for his deed, while all other involved actors stay unpunished. This is exactly what we mean by the problem of many hands.

### **3.7 Other investigations**

Beside the Board, other authorities have also conducted research on the fire. One research is a joint effort of a number of inspections of the central government (VROM-inspectie, Arbeidsinspectie and Inspectie Openbare Orde en Veiligheid). Their research corresponds with the main findings of the Board (i.e. regarding fire safety, licenses and company aid assistance). Yet there is disagreement on the safety of cell units in general. The different inspections of the central government infer from the examined cell units that there is ‘no evident danger’ (VROM 2006, p. 52). The Board thinks that this statement does injustice to the actual condition of temporary unit buildings regarding fire safety.

Another research was conducted by the Hendrikx Committee, appointed by the municipality of Haarlemmermeer. One of the main conclusion of the Hendrikx Committee was, surprisingly, that “the municipality Haarlemmermeer has, in all reasonableness, taken its responsibility that could be expected from a municipality in the process of permit grant for the Schiphol detention center” (Onafhankelijke Commissie gemeentelijke verantwoordelijkheden cellenbrand Schiphol 2005). Obviously it deviates from the Board’s conclusion, namely that the municipality has inadequately fulfilled its tasks. The Board thinks that the reason for this discrepancy lies in the nature of committee’s research. Namely, the length of the research was a month. According to the Board, the focus lies then more on whether the correct procedures were used, rather than on whether the content is appropriate and complete. This difference can lead to significantly other results.

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<sup>6</sup> <http://www.rechtspraak.nl/ljn.asp?ljn=BA7326>

## 4. The Swiss cheese model applied on the Schiphol fire

The purpose of this chapter is the application of the Swiss cheese model on the case. The previous chapter I have explained how an unsafe act can lead to a catastrophic result. Mistakes are not only made on the local workplace, but also on the higher levels. the upshot of faulty management decisions will manifest in the lower levels of the organization. A seemingly innocent unsafe act on the local workplace can thus have large consequences, as it causes the final breach in the defenses. This is exactly what happened in the case of the Schiphol fire in 2005.

The focus in my analysis lies more on who has committed certain acts (or failures to act), rather than on which level in the hierarchy they occurred. The hierarchical division of the organization is used as a way to structure my analysis, but is not of much relevance for the analysis itself.

The Swiss cheese model for my case is divided as follows. The process from the application for a new building until the realization and use of it serves as a basis for the slices of the Reason model. The full process as according to the Board is depicted in Figure 6.

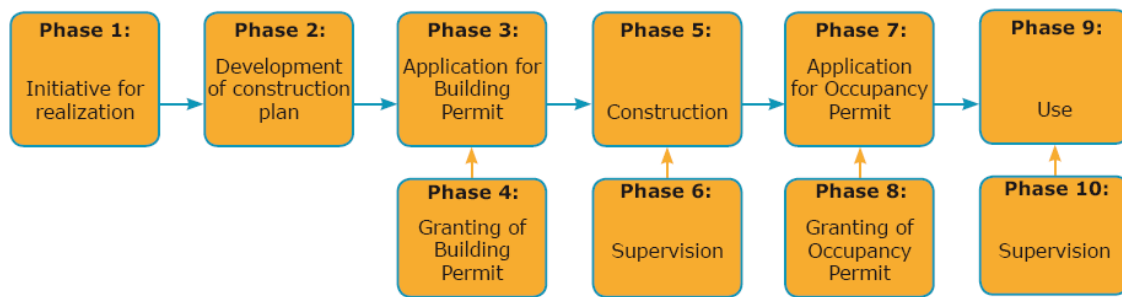


Figure 6: Flowchart showing activities from initiative to use (Onderzoeksraad voor Veiligheid 2006, p. 99)

When we integrate these processes into the Swiss cheese model, the model will look as follows:

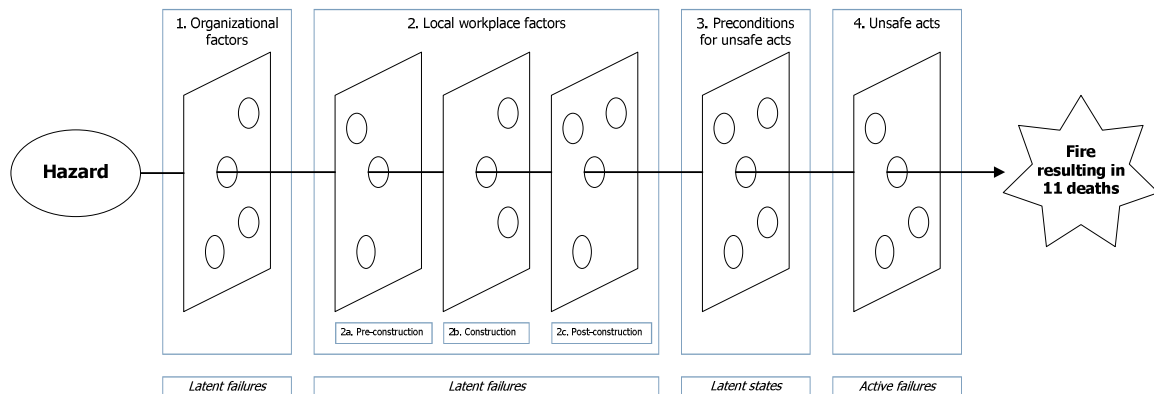


Figure 7: Reason's model applied to the Schiphol fire case



The next sections will each deal with the mistakes made on the different (sub)slices, and the parties who have made them. On every slice I will first, if applicable to the context, explain the normal course of business (existing procedures). After that I will describe what *actually* happened. I will try to remain as objectively as possible; whether an action by an actor is blameworthy is subject for the next chapter.

#### **4.1 Organizational factors**

On the first slice we find organizational factors. As was mentioned before, it encompasses factors like resource allocation and organizational climate. The influence of such factors is naturally felt throughout the whole organization. Reason (1990) states that, on the highest levels of an organization, resources have to be distributed among two different goals: production and safety. In the long run, these two goals can be compatible. But when we are talking about the short run (as resources are not supposedly infinite), conflicts of interest can arise. The dilemmas are exacerbated by two factors: the certainty of outcome and the nature of feedback. Production goals have relatively concrete outcomes, since goals like profit, market share have relatively concrete and certain outcomes. Success is usually fed back positively. Safety goals, on the other hand, do not have concrete outcomes. Resources that go into safety goals do not make the organization 'evidently' safer, since safety is a non-event (Reason 1990, p. 203-204). Also, success is indicated negatively, since the number of injuries and accidents should be small as possible. This is why safety goals often lose out to production goals (Reason 1990). This organizational dilemma is underlined by Shappell and Wiegmann (2000). Their distinction, namely, between the goal of safety and the goal of on-time, cost-effective operations, perhaps fits better in this case (Shappell and Wiegmann 2000, p. 11). In any case, both sources agree that safety is the underdog in such decisions.

The decision to construct temporary detention center involved a lot of political pressure. Since capacity (personnel and cells) was lacking to keep drug smugglers and balloon swallows in detention, the Minister of Justice was pressured to take adequate measures. In the beginning of 2002, the former Minister of Justice promised the House of Representatives that a large number of cells would be realized for drug smugglers within several months. With pressing factors like time and the detention of drug smugglers, the safety and the well-being of detention center's occupants were probably of less priority.

#### **4.2 Local workplace factors**

The next slice represents local workplace factors. They can be regarded as a manifestation of the organizational factors on the highest level that are expressed in time pressure, inadequate equipment, insufficient training of personnel, under-manning, unworkable procedures, poor communication, inadequate supervision, supervisory violations, etc. (Reason 1997, Shappell and Wiegmann 2000)

Some decisions have been made that have increased the chances of the fatal fire. They concern, for instance, the construction of the building detention center and the way the building was used. I have made 3 subdivisions in the local workplace category: pre-

construction, construction and post-construction (including the wings J and K) so as to categorize different processes that have taken place for a clearer overview.

Before we go into the depth of every sub slice, I first want to state the involved parties on the ‘local workplace’. According to the Board, the main parties are DJI, RGD and the Haarlemmermeer municipality. However, I would like to adjust one and add two other parties to the model. I have changed the municipality of Haarlemmermeer into the department of Building and Housing Supervision, since that is the actual subdivision of the municipality that was actively involved in the construction process. The same goes for the Haarlemmermeer fire department, it was not in the Board’s overview of the most important parties before. The second party I have added is the detention center’s site manager, who is responsible for the detention center’s daily course of business (see Figure 8). A number of acts that have contributed to the start of the fire have occurred under his supervision.

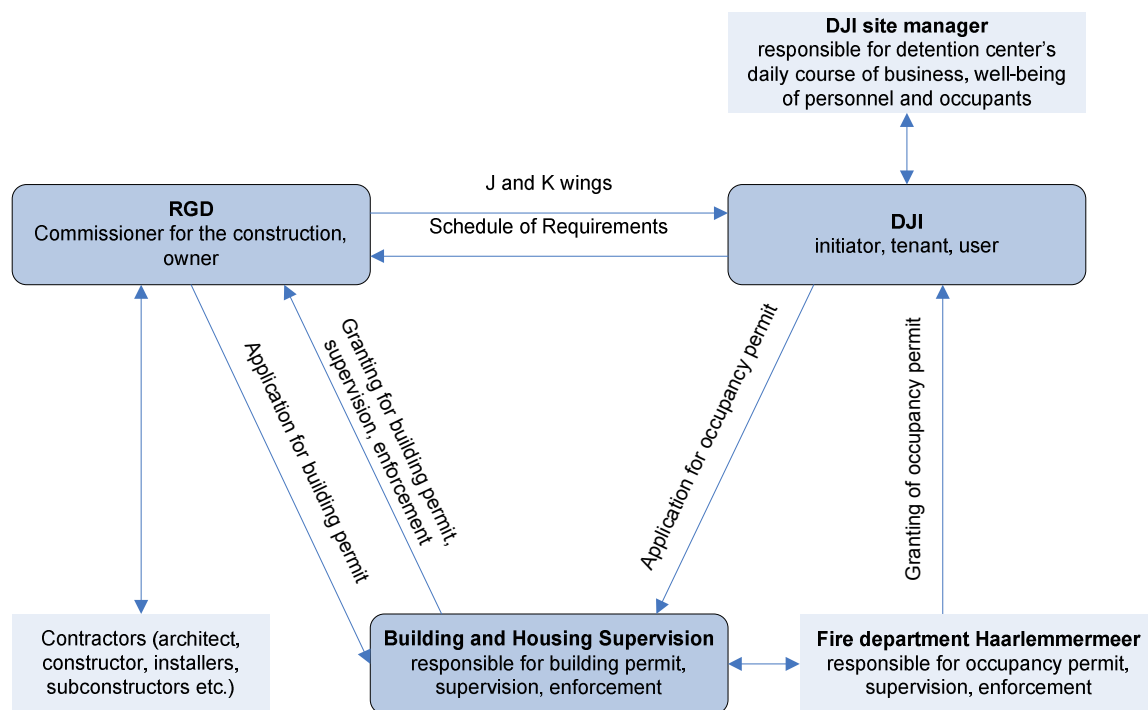


Figure 8: Overview of the most important parties, adjusted from the Board (Onderzoeksraad voor Veiligheid 2006)

In the following sections, one will see that the (conscious) decisions made by the several subdivisions of the Ministry of Justice, the Ministry of Housing, Spatial Planning and the Environment, and the Haarlemmermeer municipality are supervisory violations for the larger part. Supervisory violations occur when existing rules and regulations are deliberately disregarded by supervisors (Shappell and Wiegmann 2000, p. 11). An example is giving permission to construct or occupy a new building without a licence.

**Pre-construction**

The first slice of local workplace factors (slice 2a) represents the pre-construction stage of the detention center. This stage involves the initiative to construct the building, the

design of it and the application for the building permit. I will not go into great detail, but I will briefly explain the procedures related to the pre-construction phase of the detention center. Afterwards I have summarized per party how it has acted in accordance with procedures. For more in-depth information on the procedures, I would like to refer to the Board's report (2005, p. 99-102).

The pre-construction stage encompasses phase 1 to 4 in Figure 6. In phase 1, DJI takes the initiative for the construction of a new penitentiary (phase 1 in Figure 6). RGD regards DJI as the initiator for the construction of a new building. It is common that DJI draws up a Schedule of Requirements (Programma van Eisen, henceforth PvE), in which is stated what conditions the new building should meet. After having received the PvE, a building plan needs to be developed. For this task RGD appoints an architect (phase 2). While developing the building plan and designing the building (i.e. making the drawings), the architect has to keep relevant aspects of the construction legislation in mind. It is also RGD's task to attract the other necessary parties (subcontractors, installers) for the realization of the building. As commissioner, RGD has to ensure that buildings comply with the construction legislation for the benefit of the building permit. In the meantime, RGD applies for a building permit (phase 3). The municipality of Haarlemmer is responsible for the grant of this permit (phase 4). A building permit is provided once the building plan is tested positively against the Housing Act. With regard to fire safety, the municipal fire department has an advisory and assessment role during the process of granting a building permit.

### *DJI*

Normally, DJI constructs a PvE for a new building and hands it to RGD. However, a specific PvE for the J and K wing was not drawn up this time. These wings had a larger surface than the wings A to D. Therefore, the increased risks of fire unsafety was not acknowledged due to the absence of a specific PvE. The Ministers' joint response to the draft version of the Board's report was: 'Specific schedules of requirements are drawn up where the penal regime deviates from what is usual [...] The penal regime for the group held at the Detention Centre Schiphol-Oost falls within the category of "usual" regimes.' (Onderzoeksraad voor Veiligheid 2006, p. 103) Also, they stated that general PvE has been provided to RGD in the past. Nevertheless, had DJI provided RGD a specific PvE for the wings J and K, then it would have become clearer that those wings needed special consideration regarding fire safety due to their extended size.

### *RGD*

One of RGD's tasks is to assign an architect for the design of the new building and to give him the necessary technical specifications that are needed for the construction plan. In reality, the assignment coming from RGD and received by the architect was not very detailed. Thus, the resulting drawings were not detailed when it came to fire safety.

It is also RGD's legal duty as commissioner to provide the necessary documents to the municipality for the building permit, in order for the municipality to assess whether the building will comply with the Housing Act. However, it turned out that an adequate assessment on whether the construction legislation was met was not fully possible. This is because it was not unambiguously clear how the building was compartmentalized and how the paths of different escape routes were laid down. It was also unclear what kind of

escape routes were going to be used; were they free of smoke and fire? Compartmentalization and the realization of safe escape routes are essential elements of a building plan and the assessment of a building plan. Without this information an adequate assessment is not possible, even in broad terms. Not only that, but documentation on the used structures (e.g. for the walls) and the materials that were going to be used lacked as well. Therefore it was not possible to evaluate whether the whole would be fire resistant or not.

#### *Architect*

The architect was assigned by RGD to develop a construction plan. In accordance with the commissioner's (RGD) wishes a performance specification is drawn up and accompanying drawings are being made. A performance specification contains all construction aspects relevant for subcontractors, for example the material that is going to be used, colors, dimensions and way of constructing. In the process of developing the construction plan, the architect needs to keep in relevant construction legislation in mind. In the end, the construction plan was developed on the basis of the little (detailed) information that was provided by RGD and has been approved by RGD. The architect did not point out to RGD that there were shortcomings regarding fire safety in the performance specification. However, it is not unusual for him to do so, since the architect knew that RGD was an expert party.

#### *Building and Housing Supervision department of the Haarlemmermeer municipality*

If we follow the normal procedure for a building permit, we can conclude that the Building and Housing Supervision department (Bouw- en Woningtoezicht, from now on BWT) has deviated from the usual procedure in granting the building permit to RGD. The task of granting a permit lies with this department. In this case, RGD has provided too few documents (e.g. merely 5 drawings) and too little information in order for the municipality to do an adequate assessment. Moreover, the fire department was not in the position to provide an appropriate assessment on fire safety. The fire department was not fully up-to-date on the latest regulations on fire safety at the time of the permit granting procedure. In any case the building permit was granted more quickly than usual, since a number of procedures were not (completely) followed during the process.

### **Construction**

#### *Contractors and installers*

Next we have slice 2b, which depicts the construction stage (phase 5). On this sub slice, we find contractors and installers who are assigned to the construction of the penitentiary. They need to carry their work out in compliance with the drawings and other related documents. These contents of the assignment are provided by RGD. In the end, the detention center turned out somewhat differently on a number of features than originally was the plan (like the number of windows per cell, the interior, the number of RWA-shutters).

#### *RGD*

One of the things that have contributed to the building to become fire unsafe, was the fact that RGD allowed to have both wings J and K constructed without meeting the

construction legislation. The maximum area of the fire compartment was, for example, too large (850m<sup>2</sup> instead of 500m<sup>2</sup>), and the corridors were too long, which can pose a threat to rescue and evacuation missions in case of emergency. It must be noted that one can deviate from these requirements, as long as there is an equivalent alternative with which the same result can be achieved. This was, however, not the case.

In addition, RGD has ignored signals of unsafe incidents in the past and available information on these incidents during the construction. For instance, a fire had taken place in the C wing in 2002. This incident was analyzed by Nibra, and it came to the conclusion that the building did not meet the legislation on a number of crucial points (Onderzoeksraad voor Veiligheid 2006, p. 106). This report was not provably taken into consideration during the construction of the J and K wings. Other similar advices were also left aside.

Finally, some fire safety matters were not paid enough attention to. This has expressed itself in a number of things. For one, RGD has not sufficiently checked whether the various subcontractors had actually implemented the necessary measures for fire safety. The fact is that they had not. Secondly, it was not fully ensured that specific and up-to-date expertise was available to and applied by its contractors, both regarding the relevant construction legislation and the specific risks concerning the detention center. Thirdly, RGD's assignment for the architect was not detailed enough for an elaborate specification including details on fire safety.<sup>7</sup> Therefore, the drawings made by the architect were not detailed (also concerning fire safety), but they were approved by RGD anyway.

The point is that RGD has approved two wings containing all kinds of shortcomings and not complying with the construction legislation. From the moment RGD delivers a building (or an additional wing), it becomes owner of it.

### *Municipality*

The municipality maintains a supervisory role in this stage (phase 6 in Figure 6). Its task was to keep an eye on the construction work, that is, to see whether the building is built according to the building permit. From a municipal registration system, it has appeared that the detention center was at least visited for 6 times by a civil servant during the construction, of which one visit included the presence of the fire brigade. It is important to note that the construction had already started before the drawings and calculations had been submitted. However, it was a condition in the building permit that these documents had to be submitted at least 3 weeks prior to the construction of the part in question. Drawing from the former, it can be concluded that the municipality has supervised the construction process to an insufficient extent.

### **Post-construction**

This final stage encompasses the delivery of the building, the application for and the grant of the occupancy permit (phase 7 and 8) and the actual use of the building (phase 9), monitored by the municipality (phase 10).

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<sup>7</sup> A specification contains all construction aspects relevant for subcontractors, like the material that is going to be used, colors, dimensions and way of constructing.

### *DJI*

In this final stage, the building is delivered and an occupancy permit must be applied for. The application for the occupancy permit is the legal responsibility of DJI (phase 7 in Figure 6). Without an occupancy permit, it is prohibited to make use of the new building in question.

### *Haarlemmermeer fire department*

After DJI submits an application for the occupancy permit, it is normally the role of the municipality, or more specifically, the role of Construction and Building Department, to assess whether DJI has handed over an adequate amount of documents before granting the permit (phase 8 in Figure 6). Nevertheless, the municipality of Haarlemmermeer has laid down the entire process of permit granting (from assessment to grant) at the fire department. The BWT department is thus not anymore involved in granting the permit.

In reality, the occupancy permit was granted by the municipal fire department, without meeting all the rules. First, there was not enough information in order to do an adequate assessment of fire safety. Because of the absence of these data, the fire department did not realize that the Building Decree was not complied with. The Building Decree (Bouwbesluit) encompasses technical prescripts supporting the Housing Act (Woningwet) and is updated regularly. Second, the permit was granted before the conditions set in the building permit were met. This is of importance in the way that the fact whether a building is fire proof is dependent of the manner in which those conditions have been fulfilled (e.g. how are the smoke detectors designed and installed?). When the fulfillment of those conditions is absent, it is obviously hardly possible to judge fire safety. The occupancy permit was granted on November 7<sup>th</sup> 2003, while the final inspection of the building was carried on December 3<sup>rd</sup> 2003. Third, a lot of information was not communicated through. For example, the drawing that was submitted for the application for the occupancy permit was very minimal. It lacked, among other, information on where and how fire prevention equipment was installed. Fourth, the application form for the permit was not filled out completely. Relevant to mention in this context is the fact that the section 'Fire Safety Instructions and Evacuation Plan' merely contained the phrase 'applicable', but the instructions and the evacuation plan were not included in the appendix, and neither were they referred to. The fact that DJI said to have those instructions and plans available, was enough for the fire department to grant the occupancy permit. An assessment of the content, nevertheless, has not demonstrably taken place.

Once the wings were realized and brought into use (phase 9 and 10 in Figure 6), it was the municipality's task to do regular checks on the two wings. After the completion and during the use of the building, there have been two full inspections in 2003 and 2004 involving the wings J and K, but there no comments were made on the two wings. It has also appeared from those inspections that the extent to which there was administrative supervision was limited. For example, the fire department has not checked whether necessary certificates, logs, etc. concerning fire protection equipment for the J and K wing were present. Neither were these documents assessed on their content.

### *DJI site manager*

During the time that the detention was put into use (phase 9), some unsafe acts have occurred under the supervision of the DJI site manager of which the consequences have manifested themselves only after the accident had taken place (a clear case of latent failures). Although the site manager is not one of the main responsible parties marked by the Board, certain crucial decisions have been made under his supervision that have contributed to dangerous (pre)conditions, causing for the accident to have taken place.

First, the detention center's staff members did not possess concrete knowledge and skills in order to cope with emergency situations. An investigation of the Netherlands Organization for Applied Scientific Research (TNO) has shown that the staff did not follow the instructions procedures in case of fire since they were not familiar with them. Similarly, the guards involved in the fire had never discussed and exercised emergency procedures and occurrence plans together. Therefore they were not familiar with the fact one should always close the door of a burning cell after all its occupants are rescued. However, before the fire occurred, staff members have pointed out in a questionnaire that they would appreciate refresher courses.

Second, a risk assessment (Risico Inventarisatie en Evaluatie, or simply RIE) was not present. However, drawing up such a document is made mandatory since 1994 for all employers according to the Dutch Act for Working Conditions.

Third, on the night of the fire, there was no surveillance during nighttime. In case of emergency, the guards will arrive on site later than when they would have been present in the wing already.

Fourth, the detention center maintained a delay in the fire alarm. The rationale behind this delay is to use the time to see whether there really is a fire. The fire department, however, was not aware of such a delay.

Fifth, in the K wing it was unclear how many people and who were exactly residing in a cell. General information on the occupants was lacking.

## **4.3 Preconditions for unsafe acts**

Preconditions for unsafe acts emerge as a result of latent failures that have occurred on the higher levels. They are latent states and create the potential for numerous unsafe acts. The exact nature of an unsafe act depends on the task being performed, the environmental influences and the presence of hazards (more on unsafe acts in section 4.4).

In our case, a number of preconditions have favored the chances of an unsafe act. In principle, not all failures lead to a breach in the defenses. But in this case, some have, due to the coincidence of multiple factors. The following factors have either contributed to the fire's development or to the death of the 11 occupants:

- *Little knowledge and skills on emergency procedures*  
Little knowledge and skills lead to not knowing what to do or doing things not according to procedure in an emergency situation.
- *Lack of information on the cells' occupants*  
The absence of information on occupants in cells can delay the evacuation, since one is unable to find out immediately how many people are residing in a cell.

- *Lack of smoking ban*  
The absence of a smoking ban increases, in any case, the risk of a fire.
- *A shell construction built around the cells*  
A shell construction around the cells can be favorable for fire development.
- *Low fire resistance of cells*  
An inflammable interior of a cell can advance a fire's development.
- *Absence of surveillance during nighttime in the K wing*  
An absence of surveillance during nighttime can cause a delay in arriving at the place of the accident than when guards would be present on site all along.
- *Failing smoke and heat dissipation system*  
A failing smoke and heat dissipation system (RWA) can cause an accumulation of smoke, heat and poisonous gases. As a result of such an accumulation, it will become harder to evacuate the fire compartment.
- *Non-self closing doors*  
Non-self-closing doors can form a risk when they are not closed by someone in case of fire.
- *Long corridor/enlarged area of fire compartment*  
If the surface of a fire compartment is larger than it is actually supposed to be, there is an increased risk of guards not being able to reach all cells and rescue the occupants in time.
- *Unawareness of delay in alarm at the fire department*  
The fire department was not aware of the fact there was a delay in the detention center's fire alarm system. Thus, in case of emergency, they would be alarmed with a delay and arrive on site later than necessary.

#### **4.4 Unsafe acts**

To err is human. Unsafe acts occur all the time, but only few of them will create holes in the defenses. They can only become dangerous in certain circumstances. These circumstances have to do with environmental factors, but with existing hazards in particular. Hence, an unsafe act can only be defined in relation to the presence of a particular hazard (Reason 1990) Namely, there is nothing intrinsically unsafe about not wearing a safety helmet or a life jacket. Such negligence will only turn into unsafe acts when they occur in potentially hazardous situations (i.e. when heaving objects are likely to fall from above, or in close proximity to deep water).

On the night of the fire, one crucial unsafe act occurred that triggered the accident: the guard who opened the cell door 11 behind which a fire was developing, failed to close it after the occupant was pulled out of the burning compartment. Leaving a door normally



does not constitute an unsafe act. However, in this case it did, in these particular circumstances. According to procedure, one should close the door of the compartment in which a fire takes place to contain the fire. Because the guard failed to close the door, this act was crucial in the whole accident since it gave the fire the opportunity to development itself from the cell to the rest of the corridor and beyond.

A second unsafe act occurred when the guard not only left open the door, but also left his bunch of keys in the door. Though it could have cause an even more dangerous situation (if it was the only available bunch of keys), it has not contributed to the fast development of the fire.

#### **4.5 The hazard and the resulting accident**

Whether the smoldering cigarette bud was actually thrown away by the occupant of cell 11 or fell onto the floor is not really relevant for our model. The fact is that the cigarette bud was not put out and came in contact with inflammable material. But for the sake of the argument, let us assume that the smoldering cigarette bud was thrown away onto the floor by the occupant of cell 11. Then throwing away this smoldering cigarette bud can be regarded as the hazard that started the fire in the cell 11.

The accident can be defined as the fire that resulted in the deaths of 11 occupants of the detention center. It was caused by the cigarette bud being thrown away, but also by numerous other factors and certain decisions. As a summary, the Reason's model is shown again in Figure 9, but this time filled out with all the events related to the Schiphol fire.

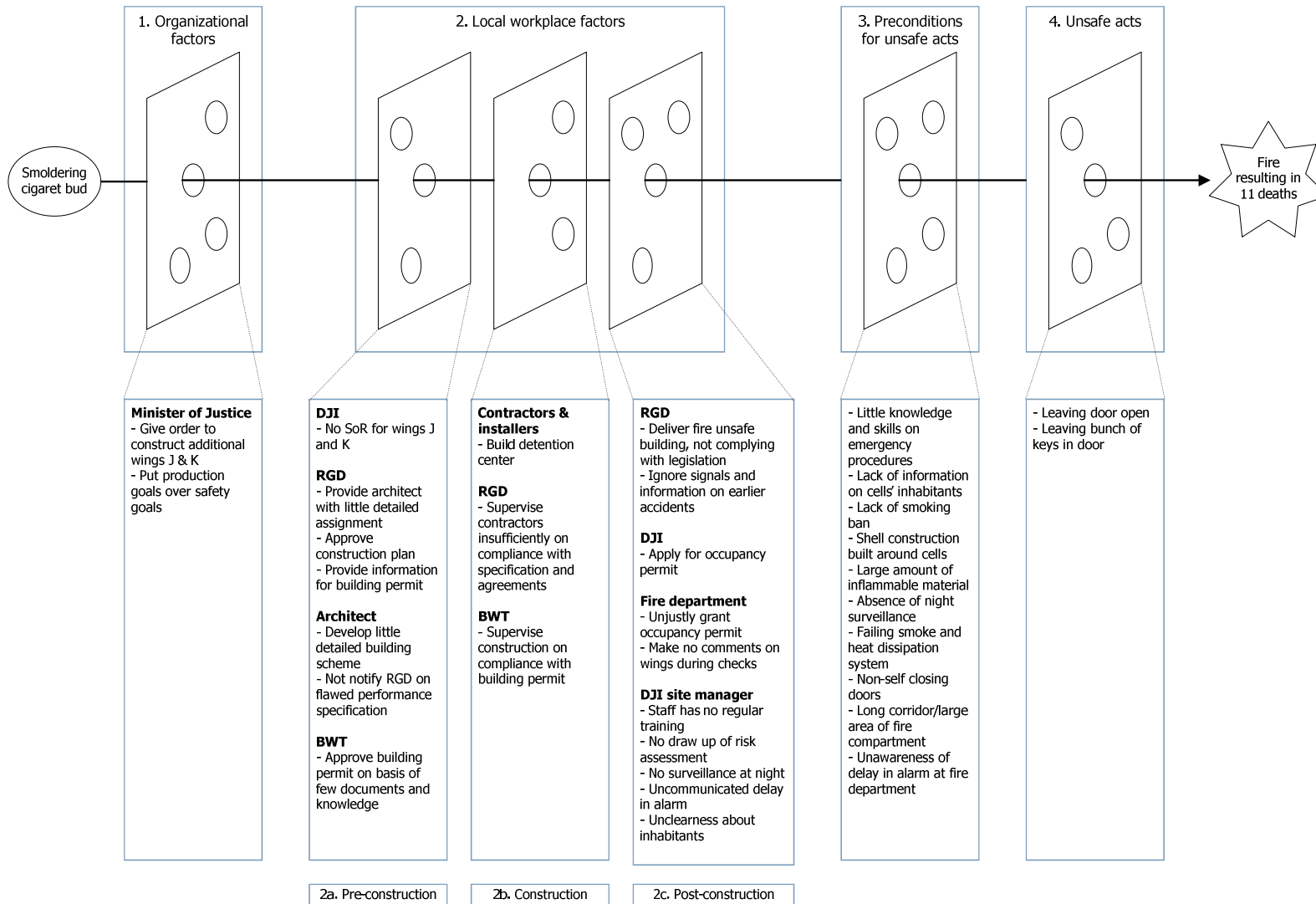


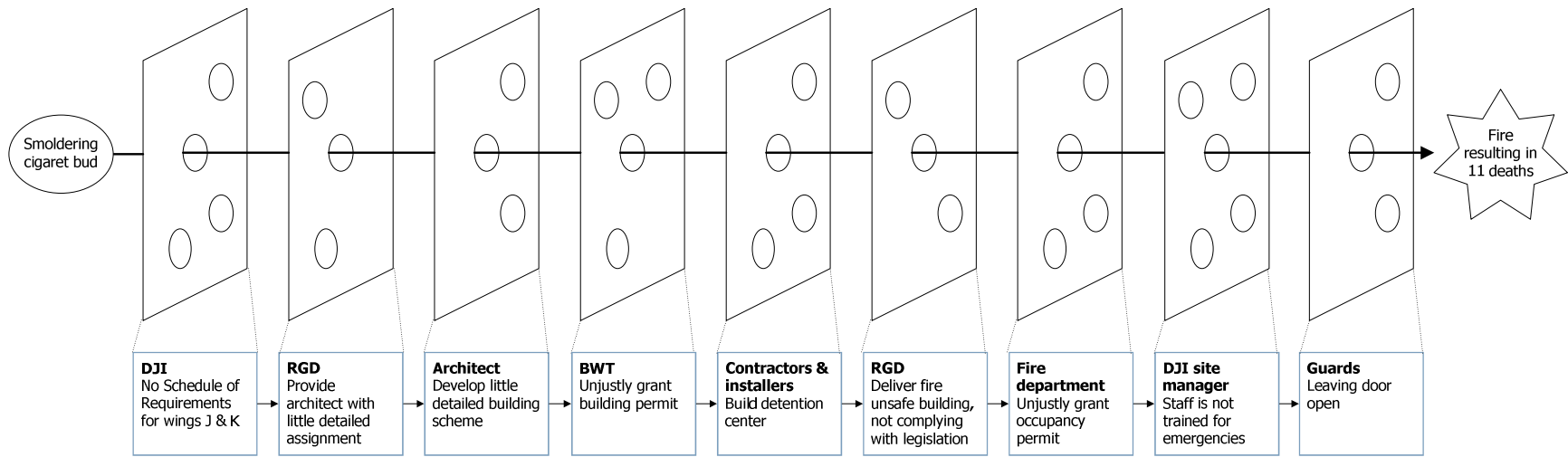
Figure 9: The Reason model as applied on the Schiphol fire

## **4.6 The chain of events**

Now that we have made clear which things happened on the different slices, let us take a look at the roles some actions have played in the accident. By the accident I mean *the fast development of the fire among wing K's corridor and the other cells which has resulted in 11 deaths*. We are interested in one thing in particular: which holes (acts) in the cheese model were a condition for the accident? A question that helps to define the (preceding) act is: what act on the preceding slice could have prevented the act on the succeeding slice from happening?

To ask define the chain of events we have to start at the very last slice (see Figure 10). The crucial event here was the cell door being left open. If it had been closed, then the fire might still have developed itself, but the chance that 11 people will die would at least be much smaller. Given that this last hole is open, we now ask ourselves the question what act on the previous slice could have prevented the last hole from occurring. What could have definitely cause the guard to close the door instead of leaving it open? The answer to this question is possession of enough knowledge and skills on emergency procedures. Unfortunately, this was not the case. How could this have been prevented? It could have been prevented if the DJI site manager gave regular trainings with the entire staff. How can the site manager be prevented to give insufficient trainings? To not let him use the building at all, that is to not grant the occupancy permit. Unfortunately, the occupancy permit was granted anyway by the municipal division BWT. The grant of the occupancy permit could have been prevented if the building was realized in line with the construction legislation. But the completed building did not comply with the construction legislation, since it was designed according to the architect's faulty building plan. The building plan would not be such a shallow one if RGD had given the architect a more detailed assignment to work with. RGD would, in turn, be able to formulate a more elaborated assignment if it had received a Schedule of Requirements of its client DJI.

As one can see the chain of the accident leads from leaving door open all the way back to not drawing up a Schedule of Requirements. The next chapter will deal with the involvement of each actor and the gravity of the actions. Figure 10 is going to be used as a guideline.



*Figure 10: Chain of events*

## 5. Fairness in distributing moral responsibility

In the literature (Van de Poel et al. 2008) the following five conditions are mentioned which are used for holding someone responsible: eligibility for normative assessment, causality, voluntariness, knowledge, and wrong-doing. It is not my purpose to debate the appropriateness of each of these five conditions. Literature mentions at least these five conditions and they form a general notion of when it is reasonable to hold someone responsible (when I say someone is responsible I mean that he is *morally* responsible). Therefore I will use them in my case.

1. *Eligibility for normative assessment*  
One can be held eligible for normative assessment if one had the intention to do or neglect something.
2. *Causality*  
An agent is causally involved when he wholly or partly produces a certain outcome.
3. *Voluntariness*  
The assumption here is that we hold an agent morally responsible for an outcome when he had the freedom do otherwise, that is, when he had alternative possibilities to choose from. Voluntariness means that the agent did not act under coercion of another agent. They could have done otherwise in the sense that there was not some sort of mechanism or greater force that would force the agent into doing something. There is much discussion on what exactly entails voluntariness and to what degree it matters. It is not clear cut and there exists no consensus on this subject.
4. *Wrong-doing*  
To hold someone responsible means also that the agent has violated some norm or caused some harm. Wrong-doing in the Schiphol fire case lies in the violation of existing rules and procedures. But more importantly, wrong-doing implies that a) an actor has done something morally wrong (not only legally), and b) that this act has contributed to the outcome. If either a) or b) is not fulfilled, then the actor is not accountable for the outcome.
5. *Knowledge*  
Moral responsibility also depends on whether the agent knew, reasonably could or should have known the outcome. And if he did know, did he do something about it or did he fail to act?

Having briefly explained these criteria, I now want to make a few assumptions. It is presumed that all the agents involved in this case that I have explained are eligible for normative assessment. That is, they are completely accountable and suffer from no backward mental health. So at least they all meet the first condition. It is also presumed

that the actors in question were causally involved, which implies that they have made a necessary contribution to the chain of events described earlier in chapter 4. Without each of separate contributions, it would not have led to the particular result of the deaths of 11 people. The remaining conditions are voluntariness, wrong-doing and knowledge, for the first two are met by all actors.

I shall now use these conditions to judge who was responsible for what and to what extent. If and only if all five conditions are met, then an agent is held morally responsible for his act. The chronology of the chain of events (Figure 11) will serve as a guide for this chapter, which implies that parties are found morally responsible (or not) in this particular case of the Schiphol fire, not in other cases.



*Figure 11: Chronology of the chain of events*

## **5.1 Draw up of the building plan: DJI, RGD and the architect**

When a building plan needs to be developed, the procedure starts with the draw up of a PvE. It is drawn up by the client, which is in this case DJI. The PvE is then handed over to RGD, which uses it as a basis to formulate an assignment for the appointed architect. The architect is then to develop a performance specification with drawings, which together form the building plan. I shall now analyze the involvement of the various parties one by one.

### **DJI: No Schedule of Requirements for the wings J and K**

DJI did not draw up a specific PvE for the wings J and K. It was wrong not to do so, since it is usual for the user of the new building to formulate a PvE whenever a new piece of construction work needs to be actualized. It contains information on what the building is going to be used for, and what norms and requirements it has to meet.<sup>8</sup> What we also know for sure is that it was mandatory for the building permit grant by the Haarlemmermeer municipality (Onderzoeksraad voor Veiligheid 2006, p. 119). The Ministers have argued that a general PvE was already present and made available to RGD. A specific PvE was not needed, according to them, since the regime in the additional wings was not an unusual one. But I do not agree. Since the wings J and K would accommodate aliens and not criminals, the regime for these people becomes different than the one for those who are accused of drugs smuggling. Due to this different regime the limiting conditions and requirements change as well (e.g. larger cells for more freedom of movement). For this reason DJI has done wrong in its neglect to formulate a specific PvE. The neglect to formulate a PvE has in addition contributed negatively to the outcome, as it was not clearly specified what requirements the building had to meet and which risks they involved.

The next question is if DJI fulfills the knowledge condition: did it know it was wrong, or should it have known that it was wrong to not draw up a PvE? According to the Board

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<sup>8</sup> <http://www.programmavaneisen.com/index.html?pag=5>

(Onderzoeksraad voor Veiligheid 2006, p. 105), DJI did mention express certain requirements, like the increased widths of the cells. Whether DJI was aware of its wrongdoing or not, relevant here is that it *should* have known. It should have known that the living space for aliens in this case has a different nature (e.g. permission to smoke) than the one for criminals, and therefore contain other risks. It also could have known that the draw up of a PvE is usually needed when a new piece of construction work must be built.

DJI also fulfills the third remaining condition voluntariness. Relevant to mention is that that time pressure was played an important role in the completion of the two additional wings. A fact that illustrates this point is that DJI chose for prefabricated cell containers instead of the usual (block work) structures, because those can be completed more quickly. Another fact is that DJI had already ordered a part of those containers, even before RGD was actually involved in the project (Onderzoeksraad voor Veiligheid 2006, p. 122) The point is that the head of DJI's division Temporary Special Facilities Directorate, who has the supervision over the detention and deportation centers, stood under pressure of his direct superiors (e.g. the head of DJI and the Minister of Justice) and could fear legal reprisal if he did not do as told. Therefore his freedom to act was limited. Since DJI does not meet all five conditions, it can therefore be concluded that DJI cannot be held morally responsible for the lack of the PvE document in the completion of the wings J and K.

#### **RGD: provide the architect with a little detailed assignment**

Has RGD done something wrong regarding the set up of the construction plan for the wings J and K? The answer is yes. While RGD may not have broken an existing rule, it did fail to formulate detailed specifications for the architect regarding the wings J and K, which can be regarded as wrong-doing. In the process of drawing up the building plan, RGD provided the architect with only few technical specifications. The assignment was very limited and therefore unsuitable for the draw up of an extensive specification including details on fire safety by the architect (Onderzoeksraad voor Veiligheid 2006, p. 116). The poorly detailed assignment has led to a poor building plan, so it surely has contributed to the negative outcome. But the providing a bad assignment is wrong in itself too, since a commissioner has to give his architect a workable order. In this regard it is tempting to hold DJI responsible for the fact that RGD received too few specific requirements to work with in the first place. But putting the entire blame on DJI cannot be right, for it should not matter what RGD's client's requirements look like or how the client (DJI) is going to use the building. Independently of what characteristics a building should have, RGD should develop (together with the architect) a building that is intrinsically safe. RGD has hence done wrong by giving the architect a rather shallow assignment containing few details.

As for as the knowledge condition is concerned, we can state that RGD should have been aware of its wrong-doing. Since it is RGD's daily job to realize all kinds over government buildings (both permanent and temporary), it can reasonable be expected that RGD knows how detailed an assignment must be in order to be able to develop a detailed building plan including the necessary fire safety details. RGD hence meets the knowledge condition.

Things change when we include the voluntariness criterion. Though RGD was just like DJI heavily pressured to complete the construction process as quickly as possible, the

arguments that excuse DJI from accountability do not automatically hold true for RGD. I acknowledge that RGD was subjected to (time) pressure and therefore was limited in its freedom to do otherwise. But unlike DJI, there was no real threat of a concrete ‘sanction’ that could be inflicted on RGD (by its superiors or other parties). Pressure does not make a certain act involuntary per se. The freedom for RGD to do otherwise was more present than the threat of some sort of legal coercion or sanction. As a consequence, RGD can perhaps not be held fully morally responsible for formulating an undetailed assignment, but certainly to a large degree.

### **Architect: Develop a little detailed building plan**

The architect’s job was to draw up a construction plan on the basis of the assignment provided by RGD, one that complies with the (fire) safety requirements formulated in the construction legislation. But the final construction plan was a deficient one: one that lacked details on fire safety. It was said afterwards that the building plan was a faulty one because it was not detailed enough. Drawing up a building plan with few details cannot be considered wrong when spoken in legal terms. It is only wrong when not all demands and (technical) specifications from the commissioner are processed into the building. When the commissioner does not set a lot of demands and such, then there is not much to be left out from the building plan in the first place. So legally spoken, the architect did not commit any blameworthy act when he carried out his job, which was developing a building plan by means of the information and details he was given by RGD. It can be nevertheless regarded as morally wrong to deliver a design for an unsafe building. The architect can be legally excused from delivering a faulty building plan, but not morally. The architect thus meets the wrong-doing condition, since not only he is blameworthy for a deficient building plan, but his design has led to an actual unsafe building as well.

Whether the architect was aware that his drawings lacked essential (fire safety) details and whether he was acting under coercion is both unfortunately unknown. It is however not very relevant if he knew. More important is the question if he *should* or *could* have known that his building plan was a deficient one. Being an architect, it can be reasonably expected that he knows what information and specifications a building plan should contain, and to what extent a building plan should be detailed. He must be aware that rules for fire safety should be applied and included as well. Moreover, it is reasonable to expect from an architect that he is able to assess whether a building is safe or not, so the knowledge condition is fulfilled as well.

Just like in the RGD’s case, there was no legal pressure on the architect to deliver a building plan on such a short notice that would cost quality. The freedom to do otherwise was present to a larger extent than the (formal or informal) pressure to do deliver a building plan so quickly that it would be a deficient one. Since the architect fulfills all five conditions, he is hence held partly morally responsible for the deficient building plan.

## **5.2 Grant of the building permit: BWT**

In the previous chapter it became clear that the building permit was unjustly granted to RGD by the municipal department BWT. The unjust grant relates to two main points. The



first concerns the lack of information that was provided with the application. As was said before, the building permit was applied for by RGD on the basis of the drawings that contained too few details, under which information on fire safety (such as ventilation facilities and fire safety systems). The necessity of fire safety documents is laid down in the Order of Submission Requirements. The second point relates to the expertise that was available during the permit grant. At the time of granting the building permit, insufficient expertise was available on fire safety legislation and the specific risks associated with the detention center. Both aspects encompass wrong acts and have contributed to occurrence of the accident. Interesting to mention is that the Hendrikx Committee has said that ‘the municipality has done what reasonably could be expected from a municipality regarding the imposition of rules and conditions, implying that the municipality has done right with the permit grant considering the circumstances (Onafhankelijke Commissie gemeentelijke verantwoordelijkheden cellenbrand Schiphol 2005, p. 29). Obviously I do not share this opinion.

As far as the knowledge criterion goes, the BWT department is supposed to know when it is legitimate to grant a building permit. BWT is also supposed to have the required expertise on fire engineering. Whether the BWT actually knew everything that is necessary to grant the building permit is however not very important, since BWT has committed a wrongful act and can reasonably be expected to know when it is appropriate to grant one. The Hendrikx Committee, again, takes another position in this case. During the examination the municipality’s performance regarding the permit grant, one of the issues discussed was if BWT had to have the most up-to-date knowledge on fire engineering. The Hendriks Committee concluded that it was unreasonable to expect such specialized knowledge for a municipality to have at its disposal. Such expertise cannot be expected to be available at all time. But this cannot be right. The question arises if the municipality cannot be expected to have this specialized knowledge available when it grants the permit, then who can? So the municipality should have had this knowledge and the knowledge condition is therefore fulfilled as well.

The voluntariness condition is not so clear-cut as with the other parties. BWT has experienced relatively more pressure than other parties (from both DJI and RGD). But unlike BWT was the only authority that was in the position to give away a building permit. So in fact there was not much to fear aside from political pressure. But political pressure is not enough to make an act involuntary. Besides, wanting to grant a building permit in a correct way cannot be considered a wrong act anyway. So by fulfilling all the conditions BWT can be held morally responsible for granting the building permit on the basis of insufficient information.

### **5.3 Construction of detention center: contractors and installers**

During the construction stage, contractors and installers need to carry their work out in compliance with the drawings and other related documents. These contents of the assignment are provided by RGD. After the construction is completed RGD has to check whether everything was built according to plan before delivering it to DJI.

It is questionable whether the contractors who constructed the wings have done something wrong. Some have, some have not. Generally speaking contractors are to follow up the details in the specification (more specifically, in the Description of Work or

‘werkbeschrijving’), whether the specification is a sound one or not. The contractors who have cooperated on the building can be divided in three categories: the ones who kept to the specification (viz. the Description of Work and the drawings), the ones who did not, and the ones who carried out their assignment at their own discretion.

The ones who have kept to the specification are, among others, the contractors who have placed the shell construction and installed the RWA (let me name them ‘group 1’). In the previous chapter it became clear that the shell construction was one of the factors that were crucial (necessary, that is) for the fire’s development. Then there were others, who have installed the RWA with the two shutters (instead of four) as according to the final drawing. In the end, it did not matter that it that the RWA did not actually work, which was a contribution to the fire’s development. The blameworthiness of these contractors is questionable. In legal terms they are not blameworthy, since what they did was carrying out the work described in the specification. But morally spoken they have done something wrong, as 1) they have installed low quality components and 2) using these materials has probably contributed the fire’s development. The question arises whether they knew or could have known that installing those technical components would lead to danger. If we assume that they could have known, then the voluntariness condition would still not be met. Even if those contractors would pose questions regarding the safety of those components, they would not have the freedom to change materials as such an act could in their case lead to breach of contract. While contractors might have some moral duty to question their own activities instead of blindly follow up the instructions in the Description of Work, it is not reasonable to expect from them that they would have to risk breach of contract to comply with their own moral judgment. This situation would leave this group of contractors with little freedom to do otherwise since a breach of contract can be held against them. This group can thus not be held responsible for installing possibly dangerous components.

The next group of (sub)contractors are the ones who did not live up to the Description of Work (‘group 2’). There are two possible outcomes for these contractors. One possibility is that they actually did not agree with the (low) quality stated in the instructions and thus used even better and safer material, knowingly and voluntarily. Seeing that such an act would be praiseworthy and that by doing so they have not contributed to the fire’s development, this scenario is not interesting or relevant for our analysis. The other possibility is that by ignoring the Description of Work, the quality of the material that is actually used was inferior to the one described in the instructions. Such an act is both legally and morally culpable. Needless to say it is chiefly morally culpable since by using inferior material the fire safety decreases. This is what actually happened. One subcontractor has claimed, for instance, that he had installed fire resistant gratings. But the Board’s investigation of the burnt out cells showed that those gratings were not present, so the subcontractor’s statement is remarkable. Instead, remainings of other, non-fire resistant gratings were found. If we assume that he did not install the fire resistant seals while he was supposed to, then he is guilty of wrong-doing. Now the question is: did these contractors know that they did something wrong? If not, were they supposed to know that their act was wrong? It is unlikely to assume that the contractor who did not install the fire resistant gratings did not know about it. Its necessity was explicitly mentioned both in the specification and by RGD during a construction board meeting (Onderzoeksraad voor Veiligheid 2006, p. 115). Therefore I presume that the

contractor in question knew those seals had to be installed. The contractor meets the voluntariness condition as well, since no one was pushing him and he could have done otherwise. Given that this group of contractors have done something wrong and have done it knowingly and voluntarily, then these contractors are morally responsible for not building the detention center or installing the actual components as he was supposed to according to the Description of Work.

Then there are contractors ('group 3') who have neither ignored the specification or actively kept to it, but have filled out their assignment to their own discretion. These people have indirectly played a significant role in the accident. Legally spoken they might have done nothing wrong, but in moral terms they are blameworthy for a certain part. As I said before, the specification lacked a lot of details, under which details on what materials have to be used and the level of quality. How much influence a contractor has on his activities depends on the extent to which these kind of details are specified. The less detailed the specification is (e.g. concerning limiting conditions), the more freedom a contractor has to fill out his assignment.<sup>9</sup> It has turned out that the kind of material used for the cells' interiors was very inflammable and has favored the development of the fire. For instance, the wall covering, the floor covering, and the furniture together caused each cell to contain about 140 kgs of fuel load, which is a much larger amount than the 5-20 kgs adopted as a standard for cells in the Cells and Cell Blocks Fire Safety Scheme (Brandbeveiligingsconcept Cellen en Celgebouwen 1994, p. 82). If the performance specification did not state specific requirements for the quality of the material, then the (sub)contractor who have installed the (with hindsight) too inflammable wall/floor covering or furniture are not not blameworthy in legal terms. But morally spoken, one can say that the contractors from group 3 have had more freedom to choose higher quality material than the ones from group 1 and 2. Legally having the freedom to use whatever kind of material you want does not justify the use of bad material. At least they could have tried to use to better material while trying to stay within the budget that was given them. Group 3 can be therefore held blameworthy for using inferior material that has contributed to the fire's development while it has had the freedom to possibly choose equally expensive but more fire resistant material. It is reasonable to expect from these contractors that they know which kind of material is more inflammable and which is less. As they have acted voluntarily as well, this group of contractors can be held responsible for the use of extra inflammable material.

In brief it can be said that the contractors who are morally responsible for their mistakes during the construction of the additional wings are the ones from group 2 and 3: the ones who deliberately did not follow up the instructions in the specification (and used inferior material) and the ones who possibly had the freedom and the possibility to use superior material but did not do so. The remaining first category cannot be reasonably held responsible for deficient construction design which has led to the fire, for it did not have the freedom to do otherwise.

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<sup>9</sup> <http://www.valkarchitecten.nl/vragen/Vragen.htm>

## **5.4 Delivery fire unsafe building: RGD**

The question arises how it was possible that the contractor got away with installing no or the wrong ventilation gratings in the first place. That is where RGD comes in. As commissioner and owner of the wings, RGD has the task to make sure that the construction occurs in accordance with the specification and agreements made between parties. It had to run a full check on whether the fire safety provisions, on which was agreed that they would be installed, were actually implemented. When RGD delivered the building to DJI, it neglected to run a thorough examination. Such an act can be regarded as a morally culpable, RGD is supposed to check whether everything was built according to plan and agreement every time it delivers a piece of construction work. In addition, by failing to run a full check it has not noticed the construction deficiencies in the building, which has contributed to the accident.

The knowledge condition is fulfilled as well. As I have just mentioned, RGD checks (or has to check) whether everything was built according to plan before delivering a piece of construction work. Since it is part of the completion it is very likely is that RGD knew it had to be done. At least it is reasonable to expect that RGD should have known.

Is there any indication that the act was involuntary? Like in the case of formulating the assignment for the building plan there was the pressure of time. But here the time pressure argument to excuse RGD from moral responsibility is again not valid. Pressure does not entail that RGD had to fear actual reprisal. Besides, the importance of a safe building weighs heavier than the speed of delivery. It was unlikely that RGD would be somehow legally 'punished' for not working fast enough. Consequently, RGD in fact *had* the freedom to do otherwise, so it can be considered a voluntary action. Given that RGD has met all five conditions, it is morally responsible for delivering an unsafe building to DJI.

## **5.5 Grant of the occupancy permit: the fire department**

This final stage of the construction process encompasses the delivery of the building, the grant of the occupancy permit and the actual use of the building, monitored by the municipality. The process of the occupancy permit grant proceeds as follows. First the occupancy permit is applied for by DJI. Then it is up to the fire department to grant it. Without the occupancy permit it is prohibited to make use of the new building. When the building is brought into use, the municipality (BWT and/or the fire department) will remain to maintain a supervisory role regarding the use of it.

As it has become clear, the task of granting the occupancy permit lies with the fire department. Was the permit grant a right or a wrong action? The occupancy permit was claimed to be unjustly granted by the fire department (Onderzoeksraad voor Veiligheid 2006), with which I agree. One of the reasons was that DJI had not yet fulfilled all the conditions stated in the building permit, which is necessary for the grant. Another reason is that things were not completely filled out during the application. Besides, the overview drawing that was submitted was very sketchy and incomplete. It lacked information on manual alarms, fire annunciators, extinguishers, fire alarm center. Moreover, the fire department did not check whether the emergency evacuation plans were actually available. These examples indicate that the permit was granted on the basis of incomplete information, which was wrong to do so. The Hendrikx Committee again does not agree

on this point, which is not surprising. What holds for BWT also holds for the fire department: according to the Committee, it has done what reasonably could be expected concerning the occupancy grant, therefore indicating that the fire department was not blameworthy (Onafhankelijke Commissie gemeentelijke verantwoordelijkheden cellenbrand Schiphol 2005, p. 22).

While the wrong-doing condition is met, the case is not so clear-cut for the knowledge condition. It is unknown if the fire department knew that it had done something wrong. More relevant is that the fire department should and could have known what had to be done and which information was necessary for the application, as the fire department grants occupancy permits. The Hendrikx Committee disagrees on this condition; it thinks that the required specialized knowledge cannot reasonably be expected to be always available (see section 5.2).<sup>2</sup>voluntarily. Surely there was pressure to be felt, just like in BWT's case. It must be acknowledged that perhaps the fire department experienced more pressure than DJI and RGD (namely, from both DJI and RGD), but it was not expressed in legal form or by means of legal instruments. In addition, no one else but the fire department itself possessed the authority to grant the occupancy permit. So there was freedom to do otherwise, certainly when one possesses the authority to carry out the task in question itself. It can hardly be held against the fire department if it wants to carry out its job correctly.

## **5.6 Staff untrained for emergencies: DJI site manager**

During the occupancy of the detention center there were a number of deficiencies, but there is one particularly relevant for the chain of necessary events: the fact that the staff that was on duty during the night of the fire had insufficient knowledge and skills on emergency situations. To have staff members who have insufficient company aid experience in situations in which other people have to depend of them (namely the occupants who cannot rescue themselves) is wrong. Having insufficient knowledge and skills fact has definitely contributed to the accident resulting in the 11 deaths.

Was the site manager aware of this shortcoming that has played a large role in the accident? Should he reasonably have known that lack of training could pose danger to the safety of the detention center's occupants and staff in emergency situations? Obviously he should have, since in the first place it is legally compulsory to have (adequate) company aid assistance and second, occupants of a detention center are especially dependent of company aid assistance in emergency situations because they cannot free themselves.

Whereas the knowledge criterion is fulfilled, the voluntary criterion is not. After the building was completed the a part of the detention center was brought into use by the Ministry of Justice before an occupancy permit was even granted, due to capacity problems elsewhere (Onafhankelijke Commissie gemeentelijke verantwoordelijkheden cellenbrand Schiphol 2005, p. 20). The pressure from the higher levels of the Ministry was clearly felt at the municipality, but also at the detention center. This fact is relevant for determining the site manager's accountability, in the sense that he still had to arrange the occupancy permit while the building pas put into use (Board, p. 80). The site manager was mainly occupied with arranging the permit and writing emergency plans during the first period of the detention center's existence. Neglecting to train the detention center's

staff members was thus not a voluntary decision, as the site manager could not have done otherwise at that time due to other duties.

Relevant to mention is the change in the situation during the second part of the use of the J and K wings. I refer to 'the second part' as the period after the occupancy permit was granted and the focus of the organization shifted more to the daily care of the occupants (which was the daily course of business), and not emergency situations (Board, p. 91). As the site manager was assumingly less pressured after not having to worry about permits anymore, it would seem that he had the opportunity to carry out his duties more voluntarily. However, nothing could be more further from the truth. The site manager did not have to choice but to have some guards insufficiently trained. The staff members come for the larger part from a so-called 'DJI pool' (about 100) and for a smaller part from the external company Securior (about 40). Staff members from the DJI pool can be flexibly deployed at the various temporary penitentiary institutions. Additionally the staff at the Schiphol detention center works in shifts. If the site manager was to get all of the continuously changing staff at the detention center adequately trained, he would have been daily occupied with this task, which is just unreasonable. In short, if the site manager made sure that all of this staff was adequately trained, this would in theory entail that he would have to train at least the whole DJI staff existing of 100 people. Even with a lesser amount of guards-to-be-trained, it still cannot be done within the the site manager's daily routine (which was the daily care of the occupants). Of course it is wrongful to simply assume beforehand that the staff is sufficiently trained for emergencies (as was the case), but the alternative is even more unreasonable. Given that the DJI site manager fulfills all conditions except for the voluntariness condition, he cannot be reasonably held responsible for not having all of his staff sufficiently trained.

## **5.7 Leaving cell door 11 open: the guards**

The guards who have left cell door 11 open on that night are the last actors in the chain. Leaving the door open was wrong, as it was not according to the rules and procedures for emergency situations and has contributed to the advancement of the fire. One should always close the door of a burning cell, so as to prevent more oxygen from reaching the cell and prevent fire or smoke to spread towards other compartments. The guards have hereby fulfilled the wrong-doing condition.

Next we have the knowledge condition. This condition is not fulfilled since the guards involved in the fire were not familiar with the door closing procedure during a fire. Moreover, they thought the were doing the right thing since they did not know if there were any more people in cell 11. Lack of training is something the guards are blameworthy for, but the DJI site manager (discussed earlier). They could not reasonably have known that what they did was something wrong as they were unfamiliar with the rules.

Leaving the door open was a voluntary action, as they could have done otherwise and there was no coercion. This fact is nonetheless not very relevant since the knowledge condition is not met. Now that not all conditions are met the guards cannot reasonably be held responsible for leaving the door open.

## **5.8 Conclusion**

The five conditions intention, causality, knowledge, voluntariness and wrong-doing were used to assess an actor's moral responsibility. This chapter has shown that the actors who are morally responsible for their acts are mainly the ones who have made the decisions on the higher levels, like DJI, RGD and the architect. In practice it is usually the people on the work floor who get convicted for the mistakes that have been made in an accident, since those mistakes are often very concrete (like forgetting to switch off an apparatus or failing to do the daily check). In the Schiphol fire case on the contrary, it appears that the people on the work floor who have actually carried out concrete activities are not found morally responsible for the things they have done. Examples are constructors who have helped constructing the actual building, the DJI site manager who had to train the detention center's staff members, and the guards who had to rescue the occupants.

## **6. Conclusion**

The purpose of my research was to see whether there was a method that helps to distribute moral responsibility more fairly. More specifically, the research question was:

*“Can James Reason’s Swiss cheese model be used to distribute moral responsibility in a ‘fair’ way among the different parties, and if possible, how?”*

I have showed that this was possible by applying the Swiss cheese model onto the Schiphol fire case, which has led to a chain of events have all had a contribution in the accident. The involved actors have been tested against the five conditions intention, causality, knowledge, voluntariness and wrong-doing so as to determine whether they were morally responsible or not. All the information and facts were extracted from the Board’s report on the Schiphol fire.

### **6.1 Differences compared to the Board’s analysis**

The Board has asserted that it did not want to point fingers at who is guilty and who is not. The report was meant to learn from, not to focus on the question of guilt. But by reading between the lines it seems that it holds DJI, RGD and the municipality each responsible for the mistakes they were involved in. My notion of moral responsibility differs from the Board’s notion in a few aspects. These aspects regard the involvement of DJI, the architect, the contractors, and the detention center’s site manager.

As far as DJI is concerned I do not think DJI was morally responsible for the lack of a Schedule of Requirements for there was much pressure to be felt from its superiors to work fast (e.g. the Ministry of Justice), so much that legal reprisal could reasonably be feared. The extent of such pressure excuses one from voluntariness, which is one of the conditions for moral responsibility.

The architect, on the other hand, was not found responsible by the Board for his design of an unsafe building, since it was RGD’s legal job to provide the architect with a workable, detailed assignment. But my analysis has shown that it is wrong to draw up a building plan without sufficient safety measures. The architect can reasonably be expected to design a safe building, independently of how the building is going to be like or which special features it has to contain. He cannot rely on the legal responsibility, which implies that the architect simply does what he is told to with the information that he has got. The same goes for the contractors; they have a moral responsibility to use safer, less inflammable material if they are given the legal and financial freedom to do so.

A final example is the DJI site manager’s moral responsibility to ensure that his staff members possess enough knowledge and skills on what to do in emergency situations. He is not found responsible for his untrained staff since he could not have done otherwise. The Board has not concluded anything explicit on the site manager, but the mistakes mentioned in the report indicate he was found responsible since they regard his legal responsibilities within the detention center.



## **6.2 The Swiss cheese model as a means to distribute moral responsibility**

As to the question whether the Swiss cheese model can serve as a means to distribute moral responsibility, the answer is positive. If the Swiss cheese model can depict the chronology of an accident, it can point out when and where mistakes have been made and help to attribute these mistakes to the people who can be held accountable. Moral responsibility can then be evaluated by the five conditions: eligibility for normative assessment, causality, knowledge, voluntariness and wrong-doing.

There are however shortcomings to the Swiss cheese model. For one, it focuses mainly on the actors who were involved in the accident. It does not shed much light on the circumstances in which the involved actors have acted, or on the people who have created these circumstances. One could think of the organizational culture or environment an actor finds himself in. In an environment in which hierarchy plays a large role, as it is the case with governmental institutions, filling out the voluntariness condition will not be so clear-cut. In the Schiphol fire case, we have seen that there were in fact few cases in which actual legal coercion was present. The political pressure was nevertheless great, and many actors have had their activities led by this pressure. Though political pressure is not a sound excuse for involuntariness, it must be taken into consideration in cases where politics play a big role in the daily course of business as it might alleviate on the voluntariness condition.

Another disadvantage of the model is that when one filters out the necessary events or mistakes of an accident, the other events are left aside. They might not have contributed directly or have had a large role in the accident, but they can be considered wrong acts. It is a mistake to assume that the actors involved in the events that were left out of consideration are somehow not blameworthy.

## **6.3 Moral responsibility as a basis for legal responsibility**

If fairly distributed, moral responsibility can serve as a good basis for determining legal responsibility. The analysis of the Schiphol fire has demonstrated that it is possible to assign moral responsibility to the individual person for the individual act he has committed. By narrowing down the chain of events to separate events, it becomes easier to distinguish what happened when and who was involved in the event. For example, the guards who have left open cell door 11 are morally responsible for the wrongful act of failing to close the door, not for the 11 deaths that followed.

The positive upshot of sizing a big event down to smaller ones is that actors become visible who at first do not seem identifiable; they can easily hide behind the big entity that is called the organization. In practice, usually the actors being the last link in the chain are found culpable for their acts since they have an identity, while the ones in between get away with their mistakes. My analysis has shown quite the contrary: the actors who were found morally responsible for their acts were mainly the ones who have made decisions earlier and on a higher levels (public officials who usually go unpunished), whereas the people on the work floor were *not* found responsible for the acts they have committed (the DJI site manager, the guards, a number of contractors).

A drawback of using fairness alone as a criterion in the distribution of moral responsibility is that some acts will go unpunished. Though it is fair, it might be morally

unsatisfying if the outcome is terrible but no one can reasonably be held responsible for it, certainly when justification to society is asked for. Therefore, fairness is a good criterion to determine one's moral responsibility, but it should not be used as the mere criterion.

## **6.4 Discussion**

A number of questions and issues have arisen during and after conducting this research. These issues deserve more attention and are subject for future research. One of them relates to one of the fairness condition, namely voluntariness. In a case where political pressure and hierarchy play a significant role it remains the question where the line must be drawn between pressure and coercion. In the case of the Schiphol fire it has appeared that someone's moral responsibility depended mainly on the question whether someone had done something voluntarily or not. However, the degree of voluntariness to which he needed to be tested was not very clear-cut. The organizational culture the actor finds himself in has an influence on the extent to which he relatively stands under pressure. For example, in an organization where there is little legal hierarchy, the actor has relatively more freedom to do otherwise than in an organization where hierarchy is clearly felt. In the latter case the actor has *a priori* little freedom to do otherwise. It would be harder to resist pressure. Such a situation could alleviate on the voluntariness condition. More research could focus on a clearer working definition of voluntariness in cases where hierarchy plays a significant role.

Another issue that deserves more attention is how moral responsibility should be distributed in practice. Given that people are morally responsible, they should pay retribution for their actions. Unfortunately, the concept of moral responsibility is quite abstract and intangible. As it cannot just be expressed in quantity, how can it be distributed?

Finally, this research has shown how responsibility can be distributed fairly. Each actor was assessed on responsibility for the separate contribution he had in the accident. But the final outcome, namely the 11 deaths, was not dealt with. The question remains whether the outcome is more than the sum of its parts. Are the involved parties only responsible for their separate contributions, or should the final outcome of the disaster also be taken into account? It is worth investigating how collective responsibility fits in this picture.

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- <http://www.dji.nl/main.asp?pid=1&aid=29>
- <http://www.dji.nl/main.asp?pid=14>
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- [http://www.justitie.nl/images/1158852427\\_tcm34-19996.pdf](http://www.justitie.nl/images/1158852427_tcm34-19996.pdf)
- <http://www.justitie.nl/actueel/nieuwsberichten/archief-2006/Minister-Donner-biedt-ontslag-aan.aspx>
- <http://www.rechtspraak.nl/ljn.asp?ljn=BA8454>
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