Evaluation of alarm and evacuation procedures for security incidents. A case study of Equinor's Norwegian offices

Master's programme on societal safety and security

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Preface

I would like to thank my internal advisor, Assistant Professor Kenneth Arne Pettersen Gould at the University of Stavanger, for constructive comments and suggestions. Thanks are also due to my external supervisor Sten Torstensen in Equinor, Head of safety, security and sustainability in global business services (GBS SSU), for case description, comments and suggestions. I thank both supervisors for sharing their knowledge and pointing me in the right direction.

In writing this thesis, I have benefit from my courses in the master's programme on societal safety and security at the University of Stavanger (UiS). The programme is at the Department of Safety, Economics and Planning; an internationally leading research environment in security and safety. I am thankful to the competent and inspiring lecturers.

I have also benefit from my bachelor's degree in journalism from the UiS, partly through theoretical understanding and practical experience from interviews, and partly because successful changes to and implementation of security schemes rely crucially on good communication with key stakeholders. I would like to thank the lecturers for inspiring and well-founded lessons.

Contents

1 Introduction

With the Al-Qaeda and other islamist extremist groups attacks spreading globally, as well as attacks by individuals like Anders Behring Breivik, high profiled companies have to account for the security risk of potential shooter incidents.

The Boston marathon was bombed on 14 April 2013. Al-Qaeda ideology influenced the Tsarnaev brothers, the alleged perpetrators who were ethnic Chechens. They were responding to calls from the Islamist organisation for mass attacks on American civilians. About a month later, an off-duty British soldier was hacked to death in broad daylight as he left his barracks in London's Woolwich district. The attackers this time were British citizens of Nigerian descent. A few days afterwards, a French soldier in Paris was murdered in what was characterised as a copycat attack (Meredith, 2013).

Over the past decade, US efforts have been made to stamp out violent Al-Qaeda-inspired Islamist insurgencies in Iraq and Afghanistan. Both France and the UK sent their armed forces to support the Americans. The Al-Qaeda assertion that the west is at war with the global Islamic community seemed to be threatening large swathes of south-east Asia and Africa in addition to the USA and Europe. The incidents in Paris, Woolwich and Boston during the spring of 2013 are all examples of this new globalised and religiously motivated form of terrorism which has emerged during the present decade. Political initiatives plus military measures and tough but carefully calibrated law enforcement must be coordinated with softer elements aimed at countering ideological radicalisation in the form of an indirect strategy for dealing with the new terrorism. Meanwhile, hard counter-terrorist goals of disrupting a global terrorist superorganism with varying local manifestations worldwide are being pursued by security professionals (Gill, 2014).

I contacted Equinor about a topic for master thesis on security and was lucky that they had an ongoing process to which I could contribute. Equinor is launching an internal evaluation of alarm and evacuation procedures at its Norwegian offices, which will address both terrorism/shooters and fire. A part of this work involves evaluating changes implemented in 2016 to address potential shooter incidents. The background is the new globalised and religiously motivated form of terrorism against citizens of American and European countries, e.g., the Al-Qaeda influenced bombing of the 2013 Boston marathon and the 2013 In Amenas hostage situation by Islamic extremists at a natural gas field in Algeria, where Equinor was

directly affected.[1] My master's thesis in societal safety and security forms part of the evaluation of this evacuation procedure, and I benefited from being part of an ongoing Equinor evaluation process.

Following to a new threat assessment, Equinor has introduced a separate security evacuation drill once a year. Designated personnel will need to be extensively trained on evacuation routines and must be kept continuously informed about potential threats. What level of drilling and information would be required for personnel in general is a more open question. From both theoretical and practical perspectives, the company faces a security trade-off. While it is crucial that personnel are ready and able to evacuate in an orderly fashion in the event of a shooter incident, the likelihood of such an incident is very low at a Norwegian office. If no known or suspected threats exist, therefore, a high level of evacuation drills may spread an unwarranted sense of fear in the organisation. One must consider the risk perception of the employees. Employees may infer a risk level from evacuation programmes and information campaigns which is considerably higher than the true figure. The potential downside of such fear is lower productivity and recruitment problems. However, an added value with evacuation drills at Norwegian offices, which should be taken into account, is that employees will be prepared should an incident occur when they are working at or visiting one of the company's foreign offices in conflict areas, where the probability of an incident may be considerably higher. The same applies if employees encounter a dangerous situation on their private holidays. In assessing this trade-off, Equinor must also take account of the cost when determining the right level of evacuation drills and information campaigns.

If there is a concern that realistic or frequent security drills will scare employees to the point that it negatively affects motivation and recruitment, it is important to note that it is not the technical or scientific probability of actual terror events that are relevant. The relevant figure is the probability that the employees assign to terror events, so individual risk perception is crucial. A potential problem is that the risk that individuals assign to a terror attack may be amplified by security drills, i.e., repercussions of individual and group perceptions may generate an unwarranted picture of high risk (Kasperson et al., 1988). A relevant question for an oil company that is to have a terror evacuation drill is how this amplification process will play out when it comes to the employees' perception of terror risk, and whether and how the

[1] https://www.nytimes.com/2013/01/17/world/africa/islamists-seize-foreign-hostages-at-algeria-gas-field.html?hp&_r=0

company can influence employee risk perception by how they design the drill, by early employee involvement and by their communication strategy.

This thesis will shed light on the various elements involved in this trade-off. The research question to be addressed by the thesis is thus as follows:

How should and does Equinor make the trade-off between providing the employees with a necessary level of skills relating to security threats and evacuation procedures on the one hand, and the possibility of generating fear among the personnel on the other?

The overall research question is thus two-dimensional:

(a) to teach the employees the necessary evacuation skills, versus
(b) avoiding generating unwarranted fear.

The overall research agenda is broken down into more specific research questions pertaining to this trade-off, representing controversial activities that may generate fear:

- Should Equinor have separate terror evacuation drills?
- Is it sufficient with e-learning programmes?
- Should drills and e-learning complement each other?
- How often should there be evacuation drills?

In the thesis I make use of the theory of social amplification of risk, and examine to what extent Equinor has been able influence risk perception among the employees, to dampen the effect that they infer an unwarranted level of terror risk from terror drills. This is based on a recognition that employees, when considering risk, incorporate value-laden considerations such as equity, catastrophic potential and controllability, and thus are prone to social amplification of risk (Slovic, 1992, p 150).

The research question is in the thesis is analysed with reference to existing theoretical and empirical literature. I examine normative theory on security measures and explore experience and practice from countries and sectors where they have frequent security incidents. The thesis has a large empirical component, comprising both quantitative and qualitative interviews. I start with standardised interviews of a selection of Equinor employees at the headquarter office at Forus. These are data supported interviews presented the respondents via a web link. The response to the questionnaire is analysed by use of basic statistical methods. The benefit of this approach is that it is possible to reach a large number of respondents and

get answers on a standardised format, thus generating findings of statistical significance. The questionnaire will be able to indicate vital inputs to evaluate the trade-off between evacuation skills and fear, e.g. whether the employees feel safe at work, how they experience the evacuation drill, and whether they know what to do in case of a security emergency. The limitation of the questionnaire is in the fixed format that restricts the information the questionnaire can obtain from the respondents. I therefore complement the quantitative analysis with a qualitative survey in the form of semi-structured interviews with key Equinor stakeholders pertaining to security. The semi-structured interviews are able to provide more details on the evacuation system and the trade-offs behind it, e.g. in deciding on the combination of security drills and e-learning and the frequency of drills.

In the thesis I cover two strands of literature; theory and industry applications. The thesis benefits from general theory on security. I have not been able to find much adequate security theory, so in addition I make use of analogies from safety theory. I also benefit from research that does industry applications. The two strands of literature complement each other. Whereas safety literature to a large extent is theoretical, general, overarching, normative and critical, security literature is predominantly empirical, practical, sector specific and descriptive. I have not found studies on the petroleum industry, so I use analogies from applications on other industries.

Compared with safety, security is not an established and well scrutinised research field, it is addressed more at the practical than the academic level. Information is also to a large extent confidential – the wish to share data, analysis and insights is lacking. The studies are dominated by the public sector, there are few studies of private companies. The available literature is thereby limited, and this poses a challenge. I have extracted information from the available literature, which is mostly sector specific security studies. I have not found any research addressing the evacuation of offices in relation to shooter incidents. Office studies typically address other topics, like Bentley and Haslam (2001) who study slip and fall accidents in postal delivery offices. The security studies available are not studies of offices but offer potential interesting analogies.[2]

[2] A fairly extensive quantitative literature exists on evacuation. One example is Zhen-Yu et al (2016), which simulates an evacuation after a subway disaster.

2 Case description

Equinor ASA (Statoil and StatoilHydro) is a Norwegian multinational energy company headquartered in Stavanger, Norway.[3] It is a petroleum and wind energy company with operations in more than thirty countries and more than 20,000 employees. It is the largest oil and gas operator in Norway, one of the world's largest offshore operators, and has a growing activity in renewables.

The remainder of this section is based on a conversation with Head of safety, security and sustainability in global business services. Equinor had fire bells and an evacuation plan which involved going to the nearest exit and from there to a muster point. This was the original evacuation plan for the company before changes were implemented and is still the model used by most companies in Norway. However, Equinor saw that the threat picture had changed, particularly in relation to ISIL. Incidents in the Middle East spread, and terrorist outrages also occurred in the UK, France, the Netherlands and even in Norway on 22 July 2011. Terrorism and major security incidents occur both internationally and in Norway. These events are beyond the control of Equinor as an organisation. External threats made it realise that something had to be done differently. This led the company to ask how the risk could be minimised if it were exposed to an incident.

The former practice, where several hundred people gathered at a single muster point, was considered safe at the time because people got away from the building and access became easier for public services such as the police, fire brigade and ambulance. It was later recognised that an evacuation procedure adequate for a fire was flawed when related to terrorism. A person who wanted to harm Equinor could start a fire, wait by the muster point and harm employees in some way. Based on this new mindset, the company now avoids gathering large numbers of personnel in the same place. It established a work group supervised by Head of safety, security and sustainability in global business services, to look at how one system could be built which provided safeguards in different scenarios. The new solution would deal with fire in line with Equinor's legal obligations, while also handling external threats as well as possible internal dangers from mentally unstable employees who could pose a hazard to colleagues. Under the old system, six muster points were designated at Forus East. A crucial challenge was how to communicate with employees during and after an

[3] WWW.Equinor.com and https://en.wikipedia.org/wiki/Equinor.

evacuation. Security personnel wearing yellow vests were also provided for each floor but communicating with these was also challenging.

Several issues concerning the new evacuation plan were subject of discussion. What were the legal emergency planning requirements relating to potential and actual terrorist incidents in general, or to known threats? Were there specific requirements? Some discussion also concerned whether evacuation drills should be performed and, if so, to what extent. What was the implementation cost? One cost element was that all the documentation on evacuation needed to be updated. What was the risk of implementing a new system? To determine which solutions were most expedient, Equinor also examined what other firms in its industry did and looked in addition at the policies pursued by companies in other sectors.

Historically, the USA has been the state most exposed to violence in the OECD area. It has experienced such deadly events as high-school shootings. Therefore, US institutions and corporations have developed the *run, hide, fight* emergency response. Equinor saw early on that this method offered a way to minimise the risk. However, similar school shootings are very rare or non-existent in Norway. Such incidents have been seen in Finland and other countries, but not at the same level as in the USA. Looking at terrorist threats in the USA, Equinor saw that the American strategy for emergency response could also be relevant for private companies. The UK, and especially London, has had terrorist incidents leading to the implementation of *run, hide, fight*. The American system was most focused on fight, whereas the British approach gave more weight to run and hide. This distinction most probably reflects cultural differences. Equinor adopted this system and added an e-learning programme distributed to all employees. Considering that company employees put in several thousand travel days to different places around the world, the programme was not confined to people working in the offices. Equinor's view of the risk picture is that an employee is more likely to be in the wrong place at the wrong time abroad than that Equinor will actually be a terrorist target itself. Gradually, as time and internationalisation passed, the company had people located where terrorist incidents are more likely to take place. That was one of its reasons for making *run, hide, fight* part of the new evacuation method.

ConocoPhillips, Shell and ExxonMobil in Rogaland – three major companies in the same industry – operate with different evacuation patterns for fire and security incidents. In the case of a fire alarm, personnel still gather at muster points. This relates only to the evacuation routines utilised by these companies in Stavanger, not internationally. Equinor considered this

to be an inadequate solution. A shooter may trigger the fire alarm to hurt personnel at muster points. It thereby wanted a combined evacuation method for both types of events.

Equinor asked the other companies whether they organised drills with the evacuation routines. ExxonMobil had arranged one drill but got so much negative feedback that it stopped doing so. The employees formed the (probably misguided) impression that ExxonMobil, as a US company, was particularly vulnerable to terrorist threats, and became anxious. The company continued to hold fire drills. Shell and ConocoPhillips have fire drills, and the muster points are at building 400-500 metres away.

Equinor developed an evacuation routine which it considered adequate, and established success criteria. Only one way to evacuate would apply, whatever the incident. This was primarily for Norwegian offices, but the model would also have to be established for Equinor internationally, since it has almost as many employees worldwide as in Norway. A challenge in this respect is that many of the international office buildings are also occupied by other companies, unlike the position in Norway. If only one of 17 floors for instance, is occupied by Equinor's employees, it cannot compel the landlord to apply its evacuation model for the entire building. The same methodology still applies for the people on this one floor, and for employees who are based in Norway and travel for work. The main change in the new evacuation model is the exclusion of muster points. Should a fire break out, the bells will go off as before. If a security incident occurs, the PA system will tell people to stay away from the main entrance and act in accordance with the *run*, *hide*, *fight* model. If possible, the system will also inform them about the specific event, such as a bomb threat, through predefined messages. In addition, manual messages can be shared through this system – to tell employees to stay away from the main entrance, for instance, and in this way control the crowd. The point is to remove people from the risk and minimise it. Another change is a mass communication system which can inform employees through text messages. It is also used to tell people when they can return to the office after evacuation. Only the alarm centre can send such messages, and they must be approved by the police.

At the same time as Equinor introduced the new evacuation model, it implemented a security project. Retractable bollards have been installed outside the Forus building which can be raised to close off the area with the highest potential for a car bomb, a drive-by shooting or an attack on the main entrance. They can also be raised if the threat level goes up. In addition, all the glass facades are coated to make them splinter-free. The main control panel in Forus is behind the reception area at the main entrance, where the risk of an incident is highest.

Equinor has therefore given this facility bulletproof protection as well as protecting it to some extent against explosions. If the company detects a threat, for instance, it has introduced what it calls a "state of alert". This is normally at green but can be raised a level if a change is seen in the threat situation through a message from the Norwegian police security service (PST) or its own security team. Equinor will then start to act to tighten the security of its own buildings.

When the company is conducting a *run, hide, fight* drill, employees are informed that it is actually an exercise, when it is starting and when it will end. The mass communication system allows Equinor's notification tool to communicate with the company's system for handling personal information and so forth. If Equinor employees work in the Forus East building and is on their way to work, they will be informed of a possible incident and accordingly remain at home. The weakness of this system is that at all times some people are on international travels. They will still get the alert, even though it has no significance.

Visitors are not registered in the company's SAP system, but the person they are visiting is responsible for them. Equinor's procedure specifies that a visitor cannot go anywhere without being accompanied by the responsible employee. This safeguard both people on their way to work and visitors. Practising the response to terrorist incidents can create fear and uncertainty among employees. At the same time, the police and the armed forces have questioned how knowledge of and experience with such events would improve without doing security drills. Equinor therefore decided to conduct one drill a year in all its Norwegian offices from 2016 to 2019, and then evaluate them. A "decision memo" for the management on whether to continue this will be produced during 2019. One risk with implementing a new evacuation model was the danger that employees would do what they had always done. During drills, people tended to leave the building through the entrance they used that morning. Breaking this habit is quite difficult. Equinor therefore found that it had to implement a new evacuation model while continuing to address this habit challenge.

Presentations of Equinor's project have generated questions from other oil companies and the authorities. It has not so far heard of other players implementing its evacuation model. Fortunately, the new evacuation system at Forus has not been put at a real test. While Equinor thinks the possibility of a terrorist incident at Forus is low, the drills are also conceived as a way of safeguarding employees travelling internationally. Positive feedback has already been received from one employee, who said the training helped him during an incident in Mexico.

3 Theory

First, I will present relevant theory. I can make some use of general security theory, such as Engen et al (2016) and Gill (2014). Relevant topics addressed in this literature include risk perception and learning among employees. I supplement with safety theory. I start with the theory of social amplification which is perhaps the most useful background for studying the possibility of terror drills generating an unwarranted perception of high risk.

3.1 Risk perception

Kasperson et al. (1988) refer to industry incidents where technical experts have assessed minor risk but where the public concern is strong, and the social impacts are high. They refer to decision researchers and cognitive psychologists that identify heuristics and biases that govern individual risk perception and suggest that technical risk is too narrow for decision making for issues that involve the public. The public in our context is the employees and Equinor need to be aware of employee risk perception. Since other major oil companies in Rogaland abstain from terror drills due to risk perception concerns.

Kasperson et al. (1988) formulate a model that explains why risk that appears as minor according to technical experts sometimes generate strong public reactions. Their main thesis is that there is an interaction between risk events and social, psychological and cultural processes in a way that can heighten public risk perception. Drawing on communication theory they refer to this as social amplification of risk, in which repercussions of individual and group perceptions may generate an unwarranted picture of high risk. An inference from their theory is that companies, in ignoring these higher-order impacts, may end up underestimating the risk perception of the public. The authors also argue that social amplification may represent a corrective mechanism, bringing technical risk assessment closer to a fuller risk determination. In our case this means that Equinor should account for the fact that employees may get scared by inferring a risk level that is unwarranted, potentially harming motivation and recruitment. I should note that the theory also opens for that the social amplification process downplays (attenuates) the negative signal.

A good description of this communication process is found in Renn (1991). The starting point of the amplification process could be and adverse event or a physical event. In our case this could be the In Amenas incident or the spreading of ISIL-activity to western Europe. Equinor responded to the changed threat situation by introducing a terror evacuation drill. The

employees make inferences of the terror drill as to the perceived probability of terror attack at Forus offices. The crux of the challenge is that individuals are selective and communicative. Individuals do not process the entire situation but select specific characteristics of the event and thereafter interpret them according to their mental schemes and their perceptions. Then the interpretations are put into messages and communicated to other groups and individuals. Individuals here serve a role as multipliers or amplifier stations in their collecting and communication their response to information about risk. A relevant question for an oil company that is to have a terror evacuation drill is how this amplification process will play out when it comes to the employees' perception of terror risk, and whether the company can influence employee risk perception by involving the employees at an early stage, by how they design the drill and by their communication strategy.

The seminal paper of Kasperson (1988) refers to cases of industrial accidents, like accidents in nuclear reactors. Still, the concept of social amplification of risk could be a useful analogy to our case. It has the same basic structure. It is a case where employees filter signals, decode, and process information, see Figure 1.

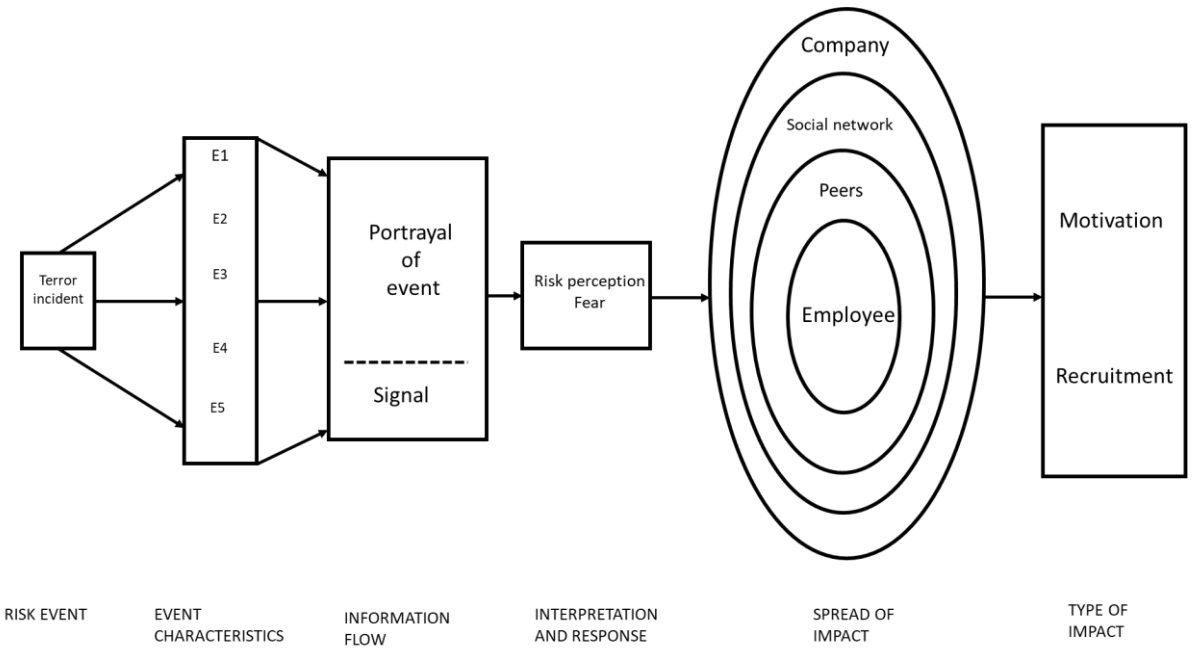

Figure 1. Simplified model of the social amplification of risk related to terror event, and potential impacts on Equinor. It is an adaption of Figure 1 in Kasperson et al (1988).

In Figure 1, the case of Kasperson et al has been modified to the issue of terror risk perception in Equinor. The model provides a richer picture of the communication process, where

employees interact with their peers and cultural groups to interpret signals. This does not necessarily mean that Equinor should abstain from terror drills. What it means is that they should be aware of these processes and account for them in its communication, evacuation schemes and drills. With involvement of employees and with a careful communication strategy, social amplification of risk may be dampened. The message of Kasperson et al is to account for potential social amplification. They argue that if these higher-order impacts are ignored, adverse effects of some risk events will be underestimated.

Kasperson et al (2003) show how the amplification process of figure 1 can be broken down in several parts; as depicted in Figure 2.

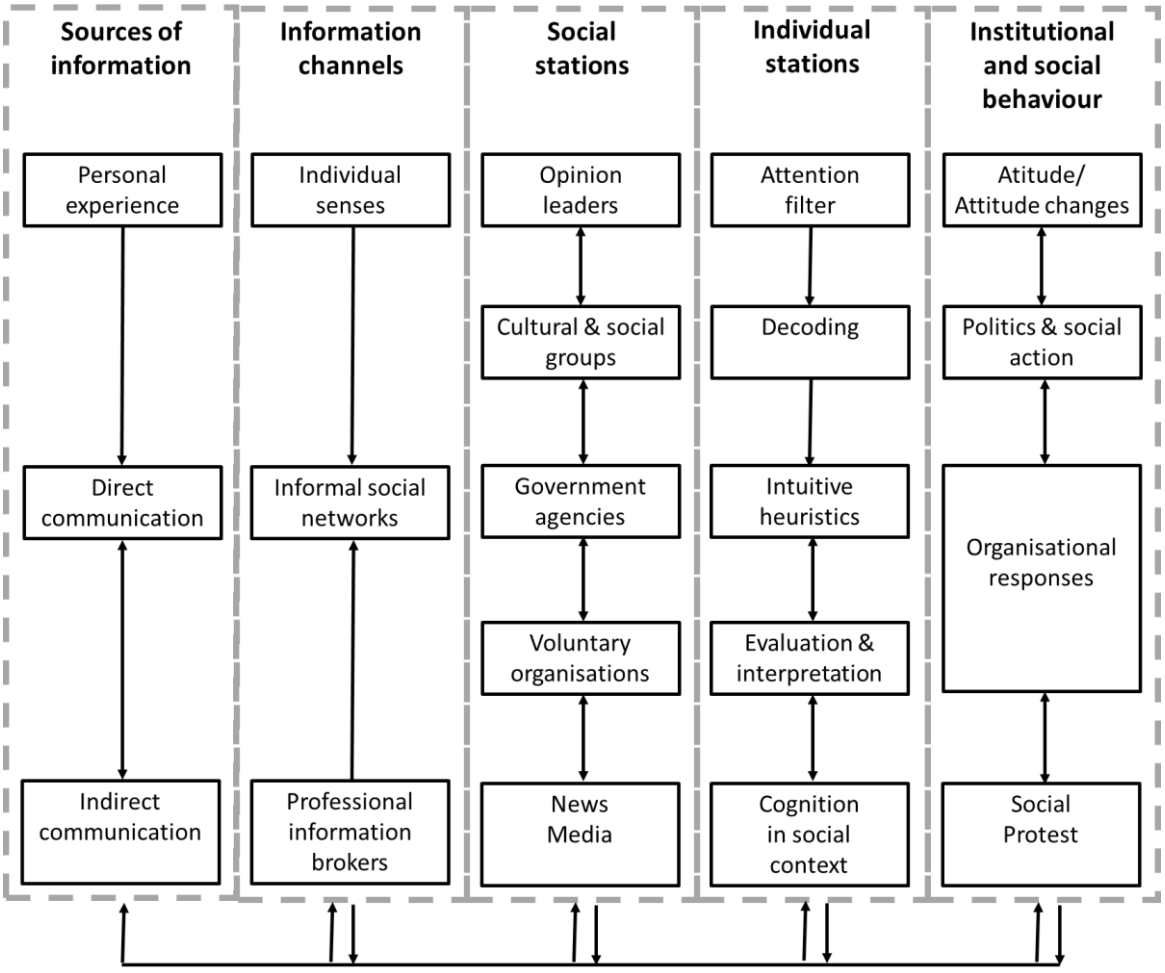

Figure 2. Amplification and attenuation. Excerpt from Kasperson et al (2003), pg. 30.

In Figure 2, the box "Organisational response", can in our case be interpreted as Equinor's response to the increased terror threat, in particular the introduction of a terror evacuation drill. The larger box "Institutional and social behaviour" also include *attitude changes* and *social action*, which fit our case. The terror drill is decoded and interpreted by employees and amplified through formal and informal social networks, represented by the box "Social

stations", that include both *opinion leaders* and *social groups*. Company management cannot control this process but can influence it. Management involvement and communication is essential. Another factor is employee representation and involvement, which is crucial in a Norwegian employment setting, and which potentially may affect risk perception e.g. in curtailing the drill to employee feedback. The format of a terror drill, how realistic it is executed, obviously also plays a major part. The empirical part of the thesis will ascertain to what extent Equinor has succeeded in reducing potential social amplification of terror risk, and the semi-structural interviews will highlight the trade-offs involved.

There is another strand of research on employee risk perception in the safety literature that may serve as a useful input to the security issues addressed in this thesis. One problem we face from a security perspective is that because of frequent security drills, employees may infer a threat level that is higher than the actual level. In the safety literature the problem is the reverse, that the employee underestimate risk. If some of these aspects from safety situations are relevant to security settings, the problem of overestimation of terror risk is reduced. The fundamental issue is how employees cope with events that have a very low probability. Few people suffer a serious accident during their working life, and this effects the probability they assign to such type of risk.

Like parts of technical safety risk, terror risk has low probability. However, there are features about terror risk that distinguish terror security from many aspects of technical safety:

- Perceived as unfair to innocent victims
- An outside threat
- Risk probability to a large extent outside the control sphere of the company

Compared with safety risk, where a technical risk to some extent can be computed and handled, terror risk cannot be managed and controlled. These properties of security risk associated with terror make it particularly exposed to social amplification. Hence, the challenges related to risk perception is different from safety matters.

More generally, psychometric research demonstrates that, whereas experts define risk in a narrow, technical way, the public has a richer, more complex view that incorporates value-laden considerations such as equity, catastrophic potential and controllability. The issue is not whether these are legitimate, rational considerations, but how to integrate them into risk analyses and policy decisions. Paul Slovic (1992, pg. 150)

According to Renn (2008), to understand risk perception, it is necessary to study the psychological, cultural and social component, as well as their mutual interactions. Researchers may be assisted by the framework of social amplification to understand and model such an integrative perspective on risk perception.

Safety measures are often rated by how well they work and what they contribute during actual incidents in organisations. Best practice can be used as a basis for change and developing measures. This can be characterised as a functional security development, where the basis is a trial of measures in relevant systems related to actual incidents (Pettersen & Bjørnskau 2015). Without relevant incidents, it is hard to contextualise measures – associate them with threats. This means that opportunities for learning through evaluating measures against actual incidents is limited. The lack of contextualisation is relevant in preventing systemic risks and is highly relevant for security against terrorism (Engen et al 2016). Lack of experience results in the fear of undervaluing risk (Pettersen & Bjørnskau 2015). When nothing serious has happened, it is possible to argue that security measures contributed to the situation. On the other hand, if a measure is dropped and an incident occurs, such arguments are not available to hide behind. Such considerations contribute to work on security against terrorism becoming highly politicised (Mueller 2004).

Rundmo (2000) has undertaken a study of risk perception and safety in Norsk Hydro. The company is in many dimensions comparable to Equinor, and employee risk perception is central to this thesis. There may be some interesting analogies from safety matters, in particular that employees underestimate risk and that management priorities are crucial. The study of Rundmo is empirical, but he also surveys theory on risk perception.

In his study, Rundmo notes that few people suffer a serious accident during their lifetime. Studying employee risk perception is primarily interesting because it can affect the probability of accidents and injuries to health as well as risk behaviour. Separating risk into an emotional or affective component and a cognitive component allows an individual's experience of risk to be described (Sjøberg, 1993). Emotions takes precedence over cognition (Zajonc, 1980). However, the cognition is not regarded as conscious, deliberate and rational (Epstein, 1984). It must precede emotion because it interprets stimuli in terms of their importance for the person (Lazarus, 1990). The rationalistic approach addresses the role played by rational judgements of risk and beliefs about risk as factors affecting insecurity and worry. For its part, the mental imagery approach holds that mental images influence beliefs (Sjøberg and Biel, 1983). A shift has occurred in understanding risk behaviour and

perception, from individual psychological explanations to sociological and organisational frameworks (Pidgeon, 1995). A second aim of Rundmo (2000) is to use a survey to analyse the relationship between the cognitive and affective components of risk perception, safety attitudes and safety climate, and to relate these factors to risk behaviour. The aim is to question the cause-effect relationship between risk perception, the safety climate and safety attitudes.

A total of 730 respondents from 13 plants replied to the Rundmo (2000) questionnaire. They were asked how far they agreed with statements intended to measure risk perception and behaviour, safety status, safety commitment and involvement by management and employees, safety attitudes and the safety climate. Both emotional and cognitive components of risk perception were measured. Lowering the probability of accidents among employees by reducing risk behaviour is an important objective for the company. Most of the respondents had "non-ideal" attitudes related to belief in accident prevention/activity in promoting safety. Almost 50 per cent agreed with attitudes which accepted that employees could violate rules and take chances in their job. In addition, a very large percentage rated management and supervisor commitment and involvement in safety work as non-ideal. The results confirmed that the respondents perceived their personal risk to be lower than the risk to others. Respondents also rated the probability to be higher than their own worry and insecurity. Some of them may therefore consider an accident or injury to health to be probable. Despite this, they do not feel especially worried or unsafe.

According to the mental imagery approach, emotion is conceived as basic. This implies that emotion affects rational judgement of risk and risk behaviour. The theoretical model did not deviate from the data, giving support to this view. Where rational risk judgements were concerned, the combined measure of worry and insecurity was the most significant predictor. Involvement in safety work and supervisor commitment was also strongly correlated with rational judgements of risk. Management safety priorities had a strong indirect effect on risk behaviour. The second most important variable predicting acceptance of rule violations was employee fatalism over safety and accident prevention. The mental image exerted a strong influence on judgements. Rational risk judgements influenced behaviour, insecurity and worry.

The results of this study supported the mental imagery approach to risk perception. Risk perception did not serve as a strong predictor of behaviour. However, it was found to be an endogenous variable in line with risk behaviour (Rundmo, 1997). The results are all based on

the assumption that the emotional and cognitive aspects of risk perception can be measured, and that it is possible to distinguish between them.

The study of Rundmo relates to everyday worker safety and behaviour and does not necessarily apply to infrequent terror incidents. The topic of the Rundmo study is risk behaviour, so a potential implication of the study for terror evacuation is that the behaviour of the employees will not be affected during evacuation. However, my focus is different, the thesis is not on behaviour but is more concerned with the probability of terror attack assigned by the employees and how this may be affected by terror evacuation drills, with potential secondary or ripple effects for motivation and recruitment. Rundmo does not explicitly take into account social amplification but does as the literature on social amplification emphasise emotional components of risk perception.

3.2 Drills

A basic concept in emergency preparedness and response is that training and drills in realistic scenarios create a better foundation for dealing with similar situations (Smith 2004). The idea that relevant training and drills influence how undesirable incidents are handled is a natural one. These exercises therefore become a form of link between emergency planning and allocation of resources on the one hand and responding to undesirable incidents on the other (Engen et al 2016). Furthermore, training will create a foundation for subsequent drills, which can validate or test the relevance and effectiveness of each individual's training as well as exposing the quality of interactions between different people, units and organisations (Perry 2004). Drills also provide the opportunity to try out new equipment while testing personal expertise and skills in a safe setting. In addition, the relevance of procedures, plans, resources and equipment can be evaluated (Engen et al 2016).

Relevant training and drills are naturally thought to influence how undesirable incidents are handled. These two activities become a form of link between emergency preparedness planning and allocation of resources on the one hand and responding to undesirable incidents on the other. Training and drills form part of a coherent process which comprises planning, training, drills and updating plans, resources and structures for emergency preparedness. In many respects, training is about everyone becoming familiar with the requirements for their position as well as the procedures and equipment used in a given work situation. This forms the basis for drills, which can validate or test the relevance and effectiveness of an

individual's training. It can also reveal the quality of interactions between different people, units and organisations (Perry 2004).

Drills additionally provide an opportunity to try new equipment and to test individual expertise and skills in a safe setting. Furthermore, the relevance of procedures, plans, resources and equipment can be evaluated. Full-scale exercises are the most comprehensive and realistic way to drill. Their purpose is to test all or much of the organisation covered by the emergency preparedness plan. However, they are very resource-intensive and therefore rarely conducted. It goes without saying that drills which seem realistic to the participants increase the probability of empathy and learning. Training scenarios should therefore be planned to provide the participants with a recognition effect in addition to incorporating unexpected dimensions which test their ability to handle uncertainty. Another challenge is to achieve realistic practice with decision-making in crises. This is intended to ensure that the preparedness structures are best designed to respond to a crisis and to manage it effectively (Engen et al. 2016). Drills are widely believed to be a good basis for learning. Training and drills are key activities in the preparedness process (Quarantelli 1998, Perry & Lindell 2003).

3.3 Emergency preparedness and planning

Roughly speaking, emergency preparedness means being ready to deal with an incident. It can be defined as "measures to prevent, limit or handle adverse extraordinary events" (NOU 2000: 24). Good emergency preparedness can be summarised as falling into four phases.

1. Conducting risk analyses to establish an overview of relevant threats, threats which have historically affected society, and potential threats for the future (Perry & Lindell 2003a).
2. An emergency preparedness analysis will provide both the framework for incidents which need to be established and a sizing of these incidents.
3. A plan for emergency preparedness will document organisation, equipment and resources based on the analyses.
4. Relevant training, drills and mobilisation plans for emergencies will provide a foundation for evaluating established emergency preparedness. Another example of this kind of work is fire safety and evacuation drills (Engen et al 2016).

An analysis of emergency preparedness includes establishing defined hazards and accidents, establishing functional requirements and identifying measures for dimensioning emergency preparedness and a possible response. More specifically, the analysis aims particularly at

identifying two conditions: (a) the enterprise's ambitions for its emergency preparedness and a possible response and (b) the resources which it allocates for responding to defined hazards and accidents in order to attain the defined performance requirements. The risk and emergency preparedness analyses should result both in an overview of current hazards which need to be prepared for, and the size of the emergency preparedness required. They must say something specific about the resources needed. A relevant process for planning emergency preparedness should result in an updated plan through (1) clarification of needs, (2) participation, (3) strategies for the process and not only the product, and (4) adjustments and updates resulting from changes in assumptions as well as lessons learnt from drills, incidents and crises (Engen et al 2016).

3.4 People's reactions to crises

Panic can be characterised as excessive alarm or fear which results in unwise actions to reach safety. It is also a strong and uncontrollable fear associated with loss of judgement. Panic can be characterised in addition as a form of irrational behaviour (Quarantelli 1999). It is often associated with intense fear and escape behaviour. Three different conditions can lead to panic (Perry & Lindell 2003b):

- an awareness of an immediate and serious threat
- limited opportunities for escape, with escape routes closed or disappeared
- lack of information about what is going on.

However, an important finding from several decades of studying different crises and disasters (such as floods, earthquakes and tornadoes) is that people rarely lose control during such events (Clarke 2002). Findings from acute crises also show that most people in the crisis area will participate actively in saving themselves, in searching for and rescuing others and in acute first aid. It seems natural that a high level of stress reduces capacity to deal with extremely stressful situations. Personal experience is another factor which influences behaviour in a crisis. Relevant advance training can reduce the stress experienced in such conditions. If people have established expectations about how to handle a crisis, they will try to meet these expectations more safely in emergencies (Engen et al 2016).

3.5 Dilemmas, challenges and paradoxes

A key question in this context is what level of emergency preparedness and security is enough. Theories, professional studies and expertise concerning risk, threats and security can

be good aids. Nevertheless, they rarely give unambiguous answers about what level of preparedness is good enough or how far all available opportunities should be taken to create a better and more secure society. Societal safety and security are linked to predictability and people's expectations of safety and personal security. On the one hand, security measures limit individual freedom. On the other, they highlight government risk politics and seek to make the population safe. A company must balance the probability of an incident against the certainty of costs and unnecessary fear. The dilemmas arise when measures implemented collide with other goals for social development, where political solutions or compromises seem difficult to accomplish (Engen et al 2016).

Actual undesirable incidents or knowledge breakthroughs can help to focus attention on conditions which do not necessarily represent a great danger to societal safety and security. These can nevertheless be experienced as big risks, not least because of comprehensive media attention. The terrorist's most important weapon is the staging of an incident in the media. The effect of this staging can force politicians to make choices which are not necessarily reasonable given knowledge of the risks. When choosing to prioritise and prevent some threats, efforts to combat other threats which could be more important for societal security get less attention. Effective framing as well as social and political factors can result in resources being used to combat the smaller but symbolically important hazards at the expense of other and more serious risks to society. This is a matter of the gap between current knowledge of what comprises big threats and risks, and what is politically desirable or what governments and others are willing to do something about (Engen et al 2016).

At some point, the usefulness of new measures will be reduced. Simultaneously, the price in terms of money, loss of personal freedom, or responsibility for individual life and actions will rise dramatically. Risk-reducing measures have a cost independent of whether individuals adopt them. This type of investment often only yields a payback after a long time. If the investment is successful, this will take the form of a non-event – in other words, undesirable incidents do not happen. However, it is difficult to know whether a possible absence of undesirable incidents is attributable to the investment, to luck or to completely different development trends in society. Security work is traditionally directed at removing the biggest threats and risks, but some threats will always remain which are difficult and expensive to remove. One of the great paradoxes of all security work is therefore that prevention can lead to an unwarranted feeling of greater safety. The illusion of the almost completely secure society can thereby increase vulnerability, because people forget or lose interest in taking

responsibility for their own security. Things often go wrong at times when it is felt that the lesson of how to control the threats has been learnt. The problem for both employees in risk groups and politicians is that an extended absence of incidents results in vulnerability because of reduced risk awareness (Engen et al 2016). This insight poses a challenge to the case of preventing and reducing the effects of potential security incidents at Equinor's offices at Forus. The fact that no security incidents have taken place, and the installation of a new evacuation system with regular drills, may make employees less aware of security threats. The challenge is to design information and drills in ways that keep the employees alert without causing unwarranted fear.

Pre-programming risks is to derive contingency plans with defined roles and activities for different groups of employees. It is intended to clarify as far as possible planning and roles in a crisis, on the basis that this will provide the foundation for the best crisis management. The problem with such pre-programming is that the most probable risks are selected, and plans for responding to them are more detailed. These plans can easily become over-specific and offer limited opportunities for improvisation. Developments which deviate from those planned for cannot be detected in time. The result could be that the response sticks with the plan rather than the reality. Several disasters have revealed that the people who consciously did something different from the plan were the ones who ultimately survived. The increasing unification of risk analyses, preparedness thinking and crisis management can become a risk in itself, because such uniformity could cause all responsible players to start looking in the same direction, expect the same crises, and thereby overlook early signs which could alert them to crises nobody had thought about or programmed for (Engen et al 2016).

Once Equinor employees leave the building after an evacuation, there is limited pre-programming, thus leaving ample room for individual solutions. As for the evacuation phase, pre-programming is called for to evacuate a large number of people in an orderly fashion. The advice is here perhaps to continuously evaluate the evacuation system, be open to feedback and inputs from a broad range of employees, and not get stuck in a routine.

It is a paradox that tools used to reveal risks and to prioritise measures for risk reduction can lead policymakers to prioritise the small and limited risks which are well documented, rather than the threats which are so large that they are hard to visualise. Every measure adopted to strengthen security should be evaluated after three to five years. If no effect can be demonstrated for the measure, it should be removed. Work on security and risk is long-term, and no easy solutions are available. Based on the presentation in (Engen et al 2016), seeking

to create a risk-free society is neither possible nor desirable. Applied to security risk at Equinor offices at Forus, it is not possible to eliminate all risk. No plan is foul proof and there is always potential for human error. Neither is it desirable to avoid all risk as this would be very costly, instigate too much unwarranted fear, and impose too many restrictions on the employees. Given that the probability of a security incidence is low, a cost benefit calculation would call for risk reduction, not risk elimination. This trade-off would have to be made at regular intervals, to accounts for changes in risk and cost.

4 Studies of terror and sector specific risk management

I now turn to practical studies of terror risk and risk prevention and management. This research is not directly applicable to the case of office security but allows for some interesting analogies. It is important to learn from the countries and the sectors of society that have been exposed to terror incidents.

4.1 Preparing for an active shooter incident

Some practical advice to be found, particularly in the USA, such as the "active shooter pocket card" issued by Homeland Security.[4] This provides concise advice in a situation where an active shooter is in the vicinity, including the strategy of *run, hide, fight,* adapted by Equinor. Another example of practical advice is a presentation by the Los Angeles County Sheriff's Department on how to enhance school safety by working together with law enforcement to improve prevention, preparation and response to an active shooter incident.[5] This is relevant information from an area where several shooting incidents have occurred and where the threat is perceived to be high. Much can obviously be learnt from this, but adjustments must be made when designing security procedures for low risk areas like Norway.

Not surprisingly, research reports on shooter incidents can be found in journals of emergency medicine. These also cover a wider range of topics than injury treatment. Dabrowski et al (2017) define an active shooter as a mass murderer whose goal is to cause as many casualties as possible. A closed space with a large concentration of people is the target, making many victims possible in a short time frame. This is the reason behind the decision by Equinor to

[4] https://www.dhs.gov/publication/active-shooter-pocket-card
[5] http://www.worldeducationalmedia.com/ActiveShooterSafetyConsiderations.pdf

abolish the muster points. Shooters are difficult to track as they are often solitary individuals isolated from society.

Tuttle (2015) reviews risk management issues related to mass shootings in the USA. He deals with topics that are vital to this master thesis, e.g., the discussion of drill versus table top exercises, and the frequency of drills that are necessary. The decision on how to mix drills and e-learning is an important part of the case in this thesis, addressing how to provide enough information to the employees without generating unnecessary fear. The recommendation of this study can be useful but would have to be curtailed to a Norwegian setting. The rate of mass shootings in the USA has tripled since 2011. Active shooter incidents, where police arrive at a shooting in progress, are also on the rise, according to Tuttle. Furthermore, 160 of these incidents took place in the USA between 2000 and 2013. Educational or business environments were the target in 70 per cent of the cases. Although the annual average was 11.4 incidents, it was noticeably higher in the past seven years (16.4) than in the first seven (6.4). Risk managers need to ensure that measures to secure business continuity are in place and to develop emergency plans, much as they do for other kinds of crises. Tuttle (2015) quotes from interviews with security experts. According to Lance Ewing, real estate manager at AIG, all businesses could do better at preparing for active shooter incidents. Every industry could be affected. Live drills are valuable because participants feel the stress of having to react, do something physically or make a decision. While full-scale drills can be expensive and time-consuming, less thorough training may not be enough. A mix of repeated practice, well-communicated procedures and thoughtful planning is required for coping with unpredictable circumstances like an active shooter event. William Malone, director of global risk services at McManis & Monsalve Associates, recommends full drills at least annually, and perhaps up to quarterly in some industries (Tuttle, 2015). In addition to this simple routine, reminders about safe places to shelter in an emergency or whom to notify if employees see any strange people or activities, as well as educational videos and table top drills, all help raise employee awareness of their surroundings and make them better prepared.

Teaching employees about when and how to run, hide and shelter, or to fight if necessary, can be done through brief educational sessions, according to Tuttle (2015). Emergency planning provisions can be incorporated into other staff emergency training. In the interim, it is important to conduct table top drills in smaller groups to build skills and refine the emergency plan for entities which are less at risk. According to Malone, full-scale drills are only feasible occasionally if resources in such entities are limited. He also says that one of the most

valuable functions of a fully-fledged drill is to open lines of communication. He sees not only a lack of planning across industries but also a failure to observe procedures which are already in place. Whenever a table top exercise is done, Malone says, its value lies in awareness and the thought processes required. From that, a plan can be built. Finally, he maintains that all measures add value because they get people thinking out of their normal comfort zone, when they are going to be present with an active shooter.

4.2 Implementing an active shooter training programme

Shooting events also takes place in US hospitals, and their experience in dealing with this problem can be valuable.

Their own security policies and US federal laws and regulations require US hospital administrators to incorporate workplace violence response training into their operations. A study which examined active shooter events in hospital settings over the 12 years from 2000 to 2011 found that about three per cent of registered US hospitals experienced at least one shooting event (Kelen, 2012).

Denver Health, a comprehensive health care organisation, developed a multi-tiered active shooter training programme to strengthen collaboration with community responders and to educate its staff members (Tuttle, 2015). Every year, it does a giant hazard vulnerability assessment of all the undesirable things which could happen at Denver Health, and the active shooter was high on its list. However, this "one size fits all" approach does not address the unique circumstances which can arise in inpatient, outpatient and non-clinical areas at the facility. The programme offered customised training sessions for operational research, focused on staff awareness and providing a general overview of how staff members should respond, the probability of such an event and a general overview of active shooters. Denver Health realised that an active shooter could walk into virtually any of its buildings, go to a floor and do a lot of damage.

Run, hide, fight was the advice given to staff members in responding to an active shooter (Tuttle, 2015). But Denver Health added a step called treat, which presented staff members with basic emergency response techniques. Active shooter training modules with videos which had been approved for use in staff meetings and for individual viewing were created by the programme leaders. Furthermore, the training sessions were recorded and made available on the organisation's internal website. A series of table top exercises, in the form of discussion-based meetings with key stakeholders who analysed the active shooter plan and

how it aligned with the strategies of community responders, was initiated by the programme leaders in preparation for the live drill. That yielded significant findings, including the need to revamp the plan and rewrite some of the emergency operating procedures. This step in the active shooter programme is followed by the actual full-scale active shooter re-enactment, where Denver police and Swat teams come to the hospital. The experience taught the programme team that an open dialogue between hospital personnel and community responders is vital, and that coordination is crucial. In addition, it noted that the mindset of hospital personnel had shifted from ignoring the possibility of such an event to trying proactively to be ready for it.

4.3 Lessons learned from a full-scale functional active shooter exercise in a newly constructed emergency department

Wexler and Flamm (2017) present a survey of lessons learnt from a full-scale functional active shooter exercise in a newly constructed emergency department. They address several issues that are relevant to Equinor evacuation drills. One issue is how realistic the drills should be. Another issue is how to communicate with the employees during and after a drill. Both are central issues to my study as they may affect the probability employees assign to terror incidents. A caveat is that research from areas and sectors with a high frequency of terror incidence is not necessarily transferrable to a Stavanger setting with no such incidents. While a frequent and realistic terror evacuation drills may make employees feel safer in such areas, this is not necessarily the case in a Norwegian context. Institutions in a high-risk area or sector does perhaps not, as a Norwegian company, to the same extent have to worry about secondary or ripple effect of employees assigning a higher probability to terror incidents as it is high in the first place.

An active shooter event involves according to the authors a person being “actively engaged in killing or attempting to kill people in a confined and populated area” (US Department of Health and Human Services, 2014). During recent decades, these have become more common in the USA (US Department of Justice, 2013). Guidelines to help health care facilities mitigate this potential threat were published by the Healthcare and Public Health Sector Coordinating Council of the FBI in January 2014 (FBI, 2015). According to one study, emergency department shootings accounted for about a third of those in health care facilities. Targeting this facility would potentially delay care of casualties in addition to threatening infrastructure, patients and staff (Kelen et al., 2012). The WellSpan York Hospital’s hazard

vulnerability analysis determined that an active shooter was its biggest vulnerability in 2015. According to the emergency management committee, its resilience to active shooter threats had been reduced because of lack of functional exercises in this area. As a result, a full-scale functional exercise was developed and implemented in conjunction with community partners before the newly constructed emergency department was opened for patient care. This was implemented without disrupting ongoing patient care.

A police officer from a different division than the responding local law enforcement agency was engaged to simulate an active shooter during the exercise, as Wexler and Flamm (2017) explain. He was equipped with blank cartridges and placed in the emergency department along with simulated patients and staff. Furthermore, local police departments were contacted through both the 911 emergency number and panic alarms after the simulated perpetrator began his attack. In addition, an emergency notification was shown on hospital monitors and contact supervisors initiated the hospital emergency operations plan. Portable video cameras, closed circuit video, participants and evaluators provided feedback for a debriefing. The results of this drill were later used for academic, educational and training purposes.

Although staff attempted the initial steps with all objectives, evaluators noted an obvious lack of experience in determining the order of treatment with mass casualties. The exercise illuminated areas for improvement which otherwise might have been missed in table top exercises and smaller-scale drills. According to Wexler and Flamm (2017), law enforcement officers, for instance, failed to communicate efficiently with emergency department staff to signal when an area was secure. Some staff did not hear the firearm discharges at first because the new emergency department was constructed to minimise noise. The hospital improved its mass notification capabilities with additional automated software which can communicate emergencies by e-mails, text messaging and phone calls. It was noted that realistic training conditions help participants to improve their responses. The impact which an intense, realistic exercise might have on daily operations is one of the biggest challenges (Norris, W A, Wollert, T N, 2011).

4.4 Active shooter and institutions of higher learning

School administrators and law enforcement officials are greatly concerned about the increased incidence of school shootings at institutions of higher learning (IHLs) in the USA. This has attracted the attention of researchers, and the high number of incidents have enabled them to make more precise judgement. Thus, in this research there may be findings that can be useful for securing Norwegian oil offices.

Ellies (2015) has written a PhD thesis on this topic. In the literature review, Ellies (2015) presents a) lessons learned from preparing IHLs for an active shooter event, b) alternative measures to support IHLs in managing an active shooter event, and c) alternative active shooter training for IHLs. The empirical findings of Ellis (2015) are first that educators and responders who do not train together cannot work together effectively in a crisis. Second, individuals at IHLs and responders are not clear about their interactions and roles. Third, IHLs and agencies differ considerably, and their differences contribute to confusion at the scene. A standardised curriculum on protecting the campus environment and its interests is required. IHLs need to support the law enforcement community in this process. The USA still has no standardised joint training for responders and IHL faculty and other staff. The study of Ellies (2015) explores various methods which IHLs can use to prepare, mitigate and respond to an armed intruder on a college campus.

The number of active shootings has increased. Furthermore, several attacks involved more than one location. Kelly (2012) report 230 active shooter incidents. During the Columbine shooting on 20 April 1999, two attackers opened fire on their school, killing 13 people and injuring 24. This is one reason why the research was pursued with great vigour (Kelly, 2012). During this crisis, a lack of communication between agencies, inadequate relationships and insufficient training was evident (Trump, 2009). The first responders waited for instructions from any person who would lead the way because they were unaware of who was in charge. The first special emergency response team (Sert) waited more than four hours before entering the school. According to the author, schools underplay the importance of implementing emergency plans and training to assist them in responding to and mitigating critical incidents. They also lack professional relationships with outside agencies. Trump (2009) also says that responding agencies need continuous communication among first responders to provide pertinent information about the crisis. Institutions are unfamiliar with each agency's shortcomings if they do not train together. Training with other agencies in the incident command system (ICS) and the unified command structure will not only build relationships but also help to provide opportunities for leaders to share the strengths, weaknesses and accessible resources of their institutions.

The instruments used by Ellies (2015) to gather data on the research questions included a pre- and post-training survey and direct observations to measure participants' learning outcomes. Surveys were considered effective for this study because they rely on individuals' self-reporting of their behaviour, attitudes or knowledge (Mertens, 2010). Direct observation of

behaviour by the researcher is required to evaluate and measure training outcomes accurately. Capturing the participants' accurate interpretations of the training is therefore important for informing future adaptations of the training curriculum (Mertens, 2010). Measuring participants' learning outcomes demonstrates a tangible and significant benefit which provides additional resources for interested decision-makers. Determining where the training needs to be improved or adjusted to satisfy the training objectives can be done by implementing a measuring system. Improvements in the form of mandating annual and/or standardised training for faculty and staff or developing an active shooter advanced curriculum are desirable. An evaluation of a training curriculum indicates whether it is meeting its goals and will provide a starting point in this respect (Kirkpatrick, 2014).

During the interval from pre-training to post-training, survey data were analysed by Ellies (2015) for changes to overall scores from each training provided. By comparing reactions to active shooting in post- versus pre-training, inferential statistics were used to examine whether an improvement could be seen in the knowledge gained by respondents. Survey data were analysed for changes to overall scores resulting from the training sessions. The maximum score for the post-training survey increased from 11 pre-training to 20, and the minimum score was 11 compared with three pre-training. The participants accordingly had better scores on average post-training than pre-training. This research subject derived from the recent increase of active shooter incidents at IHLs and studies which revealed that the majority of IHLs are ill-prepared to respond to such events. The conclusion is that the only way to survive these incidents is by providing IHL personnel with active shooter training which will give them the training, knowledge and confidence needed.

4.5 Extent, nature and responses to workplace violence

In their security emergency planning for terror events, Equinor accounts for the possibility that the perpetrator is one of their own employees.

Workplace violence affects employees across different job settings in all types of occupational categories. It transcends national and international borders (Kodellas et al, 2011). According to research, both the mental and physical health of the employee victim and their co-workers are affected by the experience of violence at work (Fisher and Peek-Asa, 2005). The global economic costs of violent incidents in the workplace are staggering (Farmer and Tiefenthaler, 2004). Several accepted definitions of violence in the workplace exist. The

European Commission's definition is commonly used and defines it as "incidents where persons are abused, threatened or assaulted in circumstances related to their work, involving an explicit or implicit challenge to their safety, well-being, or health" (Wynne et al, 1997). Violence has furthermore been defined to cover both psychological and physical behaviours by the International Labour Organisation. The California Occupational Safety and Health Administration has categorised work violence into three major types: relationship, consumer/client-related and external/intrusive. Scholars and media often devote attention to employee-initiated violence (Cal/OSHA, 1995). Work violence has been estimated to cost about 1.8 million lost working days each year in the USA. Financial, physical and psychological tolls are taken by violence in the workplace (NCVS, 1987-1992, cited in Chappel and Di Martino, 2000). This can also impose costs on organisations related to compensation and litigation, increased insurance premiums, high turnover rates, reduced performance and productivity, premature retirement and employee absenteeism (Hoel et al, 2001).

Evidence suggests that people who display the six following characteristics are more likely than others to commit violence at work (McDonald and Brown, 1997, cited in Chappel and Di Martino, 2006; Brown, 2013):

1. young adult males
2. history of violent behaviour
3. difficulties during childhood
4. problems of psychotropic substance abuse
5. severe mental illness which is unidentified and uncontrolled
6. being in circumstances conducive to self-directed or interpersonal violence, such as access to weapons.

Victims of violence at work are usually employees but may also be customers. Administrative controls related to work practices and policies and environmental controls which relate to workplace design, are two types of preventive measures which have been implemented and recommended for organisations to protect employees from violence at work (Marshall et al, 2003).

Administrative measures refer to work policies and practices. They include:

(a) worker and management training programmes aimed at improving conflict management, de-escalation techniques, communication and leadership

(b) staffing procedures, such as additional staffing in high-risk locations and/or at high-risk times
(c) cash-handling procedures, such as performing frequent bank deposits
(d) personnel selection or screening, including pre-employment testing (Jenkins et al, 2012; Marshall et al, 2003; NIOSH, 1996; Runyan et al, 2003; Snyder et al, 2004)
(e) processes for responding to threats or incidents of violence and harassment in the workplace (Calhoun and Weston, 2013; FBI, 2002).

Examples are also available of environmental controls as an organisational response to work violence. One is burglar alarms or surveillance cameras to increase detection. A locked entry, gates, and requirements for passes/ID to restrict access represent another. Furthermore, an organisation can adopt design strategies which increase the visibility of employees or implement such surveillance equipment as alarms, cameras and closed-circuit television. Bright exterior and interior lightning at the workplace can also be helpful (Jeffery, 1971).

5 Methods

The evacuation case of Equinor was examined by two approaches. First, a questionnaire was sent by email to a selected group of Equinor personnel. This generated quantitative data that were subsequent analysed by basic statistical methods. With this type of data set there could be potential to apply multivariate analysis, like factor analysis, giving more precise estimates of the explanatory power of each individual variable. However, the number of several of the relevant parameters was low, so statistically significant results would be hard to obtain. Instead, more complex relations were studied by using qualitative data. Qualitative data were collected by semi-structured interviews with key security stakeholders in Equinor.

5.1 Quantitative method

Face-to-face interviews involve being physically present with access to non-verbal information in the form of gestures and facial expressions and lacking a rigid structure. This generates qualitative data. Other forms of interview being increasingly used, on the other hand, are moderated by technologies such as the telephone or computer/internet (James and Busher, 2012). Here the potential answers are restricted to predefined alternatives, thus

generating quantitative data. I use both approaches in the thesis. I now present the quantitative method.

My survey makes use of a web-based questionnaire that bear resemblance to Ellis (2015), whose research on incidences of school shootings at institutions of higher learning was described in section 4.4. The advantages of using web-based surveys are according to Ellis (2015) access to larger samples, automated data collection, scoring, and reporting, quick troubleshooting, more interactive or tailored formats, and faster responses, reduced cost and convenient access to samples. On that basis, this type of survey was considered the best data collection strategy (Mertens, 2010).

The descriptive statistical strategy was considered to be the best approach for this part of the study because it summarises data on a single variable (Mertens, 2010). In a specific study, descriptive statistics are used to describe the basic features of the data. Together with graphs and charts, they form the basis for the quantitative analysis of the data acquired for this study. Additionally, the data analysis was presented using a realistic method which was easily interpreted by descriptive statistics (Trochim, 2006).

The questions I used was made available to potential respondents via an Equinor specific social media application, in the form of a web link. In recent times, computer-assisted interviews have become extremely widespread (Couper and Hansen, 2002). These can be conducted via social media, which involves an asynchronous interaction where the interviewer writes a question and then waits for a response. One advantage is that the interview transcribes itself. The disadvantage with the computer-assisted interview is also obvious: the moderated interaction introduces a potentially unfruitful reflective distance without signals from body and spoken language, and it can be difficult to generate copious and detailed descriptions (Elmholdt, 2006). I compensate for this by also undertaking semi-structured interviews with experts. As with all interview forms, the computer-assisted interview accordingly has its advantages and is appropriate for some purposes, but will be unsuitable for other research objectives – such as cases where physical proximity and the sound of the voice are crucial for the conversation.

5.1.1 Validity and reliability of the study

There are evidently challenges related to measurement issues when it comes to individual risk perception, which is a central topic in the thesis. However, the task is not to elicit specific and

abstract probabilities from the employees, but to ask them basic questions like whether they have become more afraid after the security drill. Challenges with measurement issues appear when using questionnaires, with clear restrictions on alternative answers. This is attempted compensated by also undertaking semi-structured interviews with key stakeholders. This is a format that allows for nuances, in that the interviewee gets more freedom and by follow-up questions from the interviewer.

Due to limited data in some of the questionnaire categories, multivariate analyses could not be undertaken. The bivariate analyses may have omitted variable bias. This problem has been alleviated by use of control variables and is also to some extent corrected for by the supplementing semi-structured interviews.

The questionnaire was uploaded by my Equinor supervisor on an internal social media platform in Equinor (Yammer), accessible to all employees that have office address in Norway, since this is where *run, hide fight* without muster points has been introduced. The message could potentially reach 12 000 employees. Everyone does not follow Yammer daily, so the number of potential respondents is hard to estimate. The number of respondents is 183. This is a considerable number for this kind of survey. Still, it is a very low fraction of the employees, so a crucial issue is to what extent the respondents are representative for the Equinor employees, since I have not gone through the task of generating a representative selection of respondents. Potential biases are also over-representation of employees that are active on Yammer and that are interested in security issues. A low response fraction was expected. To account for this, I included demographic and occupational control variables. If these are fairly representative, we can make reasonable inferences from the questionnaire. According to my Equinor supervisor, the composition of respondents, as summarised by the control variables, are representative of the Equinor onshore employees. This seems to be confirmed by the demographic data collected, they show the traditional pattern of the Norwegian oil sector, e.g., with underrepresentation of women and young employees and with overrepresentation of engineers.

A difficult question is to what extent the results in this thesis would apply to other companies in the oil industry or to companies in other industries. There are several special circumstances that in this case work together to dampen social amplification of risk:

(1) The company is in an industry that is used to deal with different types of risk.

(2) Workers onshore become familiar with offshore risk by visiting offshore operations or working towards the offshore activity.
(3) Many of the employees have worked abroad or visited countries with terror risk.
(4) Many of the employees have statistical knowledge, so the cognitive component of risk perception is above average.
(5) The terror drill was well prepared and executed, with early employee involvement and with good communication of background and objectives.

Thus, the results are not likely to apply generally, but the case can serve as an interesting demonstration of the circumstances under which implementation of a terror drill is possible without generating an unwarranted perception of terror risk.

5.1.2 Causality in the social sciences

The remainder of this section on quantitative method is based on Skog (2004). It presents challenges of explaining cause and effect in social sciences. To some extent I can control for this in the quantitative questionnaire by using control variables. To better accommodate this problem and to get more in-depth information, the quantitative data gathered by the web questionnaire is supplemented by qualitative data from semi-structured interviews with experts.

5.1.3 What is causality? Does it assume laws?

Put at its simplest, one thing is the cause of another if the first gives rise to or in some other way produces the second. The book which fell on the floor caused a bang. Much of the modern literature concerning causality can trace its roots back to the philosopher David Hume. He argued that causal relationships have three principal characteristics. The first is asymmetry – the cause comes before the effect in time, never the other way around. Second is locality – the effect occurs close to the cause in both space and time, and the causal relationship is therefore local in both space and time. The third is constant conjunction – every time the cause occurs, the effect will also follow. Of these characteristics, the first – in other words, asymmetry – is perhaps the least discussed. Hume's argument means that a spatially distant cause can only produce an effect here and now if a chain of causation links them spatially together.

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5.1.4 The practical-epistemological problem: distinguishing causality from random coincidences and spurious correlations

However, the question is whether the change we see is caused by the influence or whether completely different conditions have been the cause. Several possible options exist. First, chance could naturally explain why the change occurred immediately after the person was exposed to the influence. We must therefore have a basis for comparison in order to determine whether those who have received treatment are restored to health more quickly than those who have not. Furthermore, we must have methods which allow us to determine whether a possible difference could quite simply be a result of chance. Calculating probabilities provides an invaluable aid here. However, chance is not the only possible explanation for "artificial" differences between the two groups. They may not have been directly comparable to start with. In that case, the possibility that this initial difference is the real reason why the outcomes differ so much between these two groups must be kept open.

Should systematic differences exist between the two groups from the start, the possibility that these have produced the varying outcomes, rather than the treatment the groups have been exposed to, must always be admitted. If a correlation exists between two variables, A and B, and we want to investigate whether A is a cause of B, we must be able to establish that no underlying factor C exists which is the cause of B and is moreover correlated with A. In other words, a spurious correlation between two variables is one which does not reflect a causal relationship between the two factors. The underlying variable C is often called a confounding factor. In addition to the problem of spuriousity, we often face the question of the causality arrow's direction. A correlation between two variables, A and B, will not normally tell us what the cause is and what is the effect. We must therefore normally be open to the possibilities that A causes B and B causes A. Put briefly, in other words, four reasons could exist for why two phenomena, A and B, tend to occur together:

1. chance
2. A causes B
3. B cause A
4. an underlying confounding factor, C, exists which causes/is correlated with both phenomena, A and B.

5.1.5 Control variable method and experimental control

When faced with a correlation between two variables, we can choose between two main approaches in seeking to determine whether the correlation is the expression of a causal relationship. One involves intervening actively and manipulating reality (the experimental method). The other, chosen in this master thesis, comprises controlling for possible underlying factors with the aid of statistical methods (the control variable method). The latter is unquestionably the most common in a social science context – social scientists do not often get the opportunity to experiment with society. While the experimental method is less common in a social science context, it does get used in some cases. Such an approach can be adopted in some circumstances at the micro level, where the observational unit is the single individual. In order to be able to exclude possible differences in the behavioural pattern being the result of underlying factors, one must ensure that the groups which receive alcohol are comparable with those which receive alcohol-free drinks. This is achieved by randomisation - in other words, drawing lots to see which groups will receive one or the other of the drinks. This the best method for ensuring that the groups are comparable.

Using an approach other than randomisation – allowing the participants themselves to decide whether they are to receive alcoholic or non-alcoholic drinks, for example – will immediately open the way to possible distortions. Known as self-selection, this is a variant of the spurious correlation problem. This is a potential problem in my quantitative study since answering the questionnaire was voluntary. Determining that something causes something else is one thing. Another and equally important task are to identify how the cause exerts its effect. Put briefly, the control variable method involves seeking to compare sub-groups of observational units which are as similar as possible in terms of possible confounding variables. The aim thereby, with the aid of statistical methods, is to achieve what randomisation provides in experimental studies – making the groups as comparable as possible. In my setting this involves controlling for demographic and occupational variables. The control variable method assumes that systematic registration can be accomplished for all possible underlying factors of significance which might conceivably affect the person's value measured by the dependent variable (the severity of the punishment, for example) and which is moreover correlated with the independent variable (the lawbreaker's social status). This will not always be possible in practice, either because some factors of this kind cannot be registered or because inadequate information means we do not know whether a specific factor actually can create a spurious correlation. As a result, the control variable method will be unable to give us a final and indisputable answer to the question even though it can naturally contribute to good progress.

5.2 Qualitative method

In this thesis, qualitative data, in the form of semi structured interviews, supplement the quantitative questionnaire. This is since finding suitable quantitative data is difficult, which makes qualitative methods a good complement. According to Østbye et al (2013), the latter also have a number of advantages – such as the opportunity to obtain information which would otherwise be difficult to access, and to try out different hypotheses during the interviews.

To achieve a better understanding of differing attitudes to evacuation routines, training and so forth, I conducted semi-structured interviews with three Equinor security stakeholders.

1) representative for the Norwegian Union of Industry and Energy Workers (Industry Energy)
2) chief safety delegate
3) emergency response duty officer.

Since the interviewees are very experienced players, the qualitative interviewer's abilities as a conversational interviewer (Ringdal, 2013: 27) will be significant. The aim is to acquire information and to be informed by the interviewees, not to measure predefined variables. This is supported by my choice of semi-structured interviews which, according to Østbye et al (2013: 108), provide greater flexibility for following up surprising comments and for putting supplementary questions.

As recommended, I prepared a list of initial questions and amplified these with supplementary questions during the interview. The complexity of the issue meant that the interviewees were sent copies of the initial questions in advance so that they could prepare.

I devoted considerable time to preparing myself in order to be able to put supplementary questions during the interviews. I recorded the interviews, which were then transcribed. Major findings are presented in section 6.2.

Qualitative analysis involves a procedural approach (Østbye et al, 2013: 128), where the researcher's understanding of the issue and of what is relevant emerges from an interaction. A weakness of qualitative studies is that clear conclusions cannot be drawn since the sample is often small and distorted. This problem was reduced by having competent interviewees who are centrally located in the information flow on the subject.

5.2.1 The research interviews

A research interview is according to Østbye et al. (2013) an interpersonal setting, a conversation between two parties on a topic of common interest. Knowledge is acquired during the interview at the interface between the views of the interviewer and the interviewee. The semi-structured interview seeks to obtain descriptions of the interviewee's perspective with the aim of interpreting the significance of the phenomena described – it features a number of topics to be discussed as well as some proposals for questions. At the same time, it is characterised by openness with regard to changes in the sequence and formulation of questions, so that the specific answers given and the stories told by the interviewee can be followed up. The interview adopts an open phenomenological attitude to learning from the interviewee.

6 Results

I now report the main findings of the questionnaire presented to Equinor onshore employees and the semi-structured interviews with key security stakeholders in Equinor.

6.1 Main findings from questionnaire for onshore Equinor employees

The questionnaire was made in Google Forms. The data was collected by publishing the questionnaire web link on Yammer, a social network used by Equinor for private communication within the company. The link, that was uploaded by my Equinor supervisor, was accessible to all employees that have office address in Norway, since this is where *run, hide fight* without muster points has been introduced. The message could potentially reach 12 000 employees. Everyone does not follow Yammer daily, so the number of potential respondents is hard to estimate. The number of respondents is 183.

The control variables serve a dual purpose. They serve as a control on whether the respondents are representative for the Equinor employees on relevant demographic and occupational variables. When analysing the respondents' answers, it is also interesting to ascertain whether these are linked to relevant demographic and occupational indicators. For instance, do employees that work with security or that have worked abroad have different perspectives on evacuation drills than other employees? Are there gender or age differences? This addresses the omitted variable problem discussed in the method section.

6.1.1 Data

The demographic variables are listed below in Figures 3 to 11.

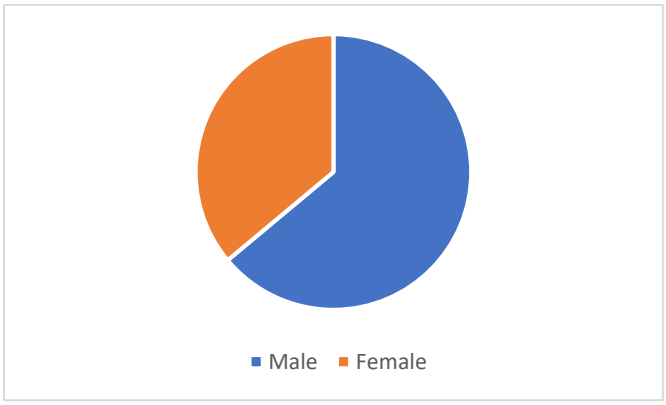

Figure 3. Gender composition

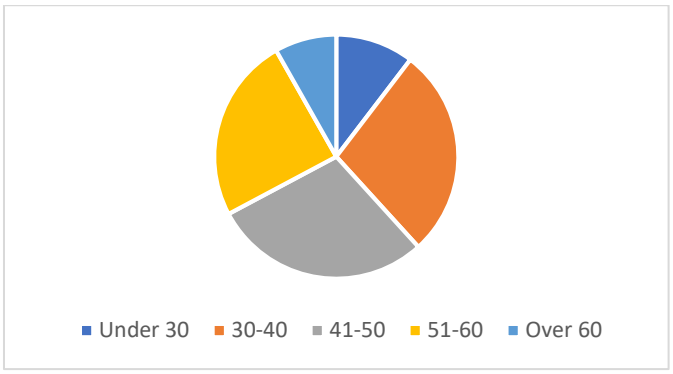

Figure 4. Age distribution

We see from Figures 3 and 4 that there is an overweight of male employees and that the average age of the employees is high. This is a well-known feature of the labour market in this sector. This statistic allows for checking whether gender or age affects attitudes towards security.

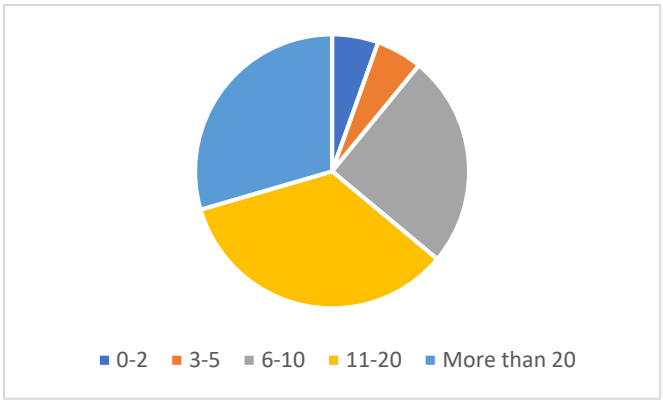

Figure 5. Years in Equinor/oil industry

Figure 5 reveals that the respondents on average have long experience from the oil industry. There are few respondents that have entered the industry in the recent years, which concurs with the downturn in the industry from 2014. Long experience from the industry may potentially have an impact on the attitudes towards emergency drills in general. But maybe not so much in this particular case, as the *run*, *hide*, *fight* procedure is new to all employees.

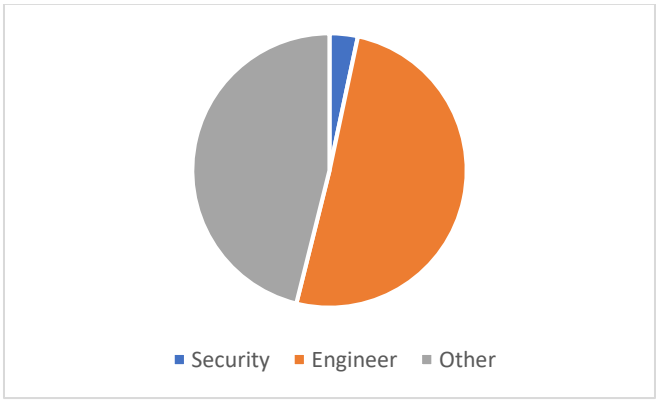

Figure 6. Occupational distribution

As expected, a large fraction of the employees are engineers; see Figure 6. The same applies to a large fraction of the personnel working with security, it is an industry with a very high emphasis on security and safety. This control variable allows us to check whether security personnel differ from the rest in terms of risk perception, etc.

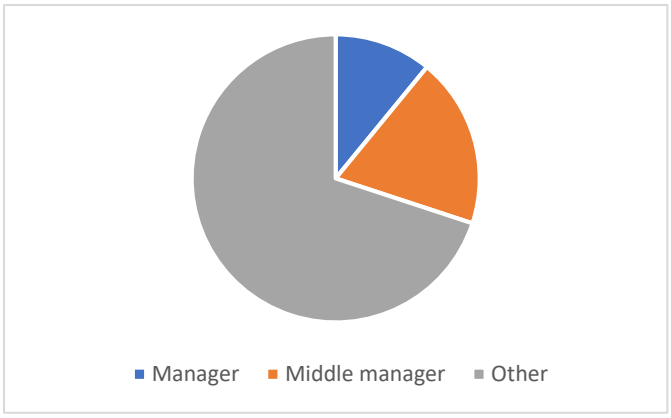

Figure 7. Rank

The rank distribution mirrors the overall distribution in onshore employment in Equinor and allows us to check whether potential variation in answers follows a rank pattern (Figure 7).

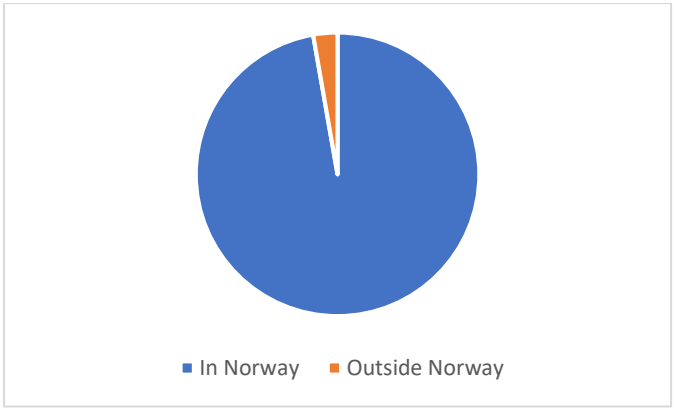

Figure 8. Place of work

The large majority of the respondents have their place of employment in Norway (Figure 8).

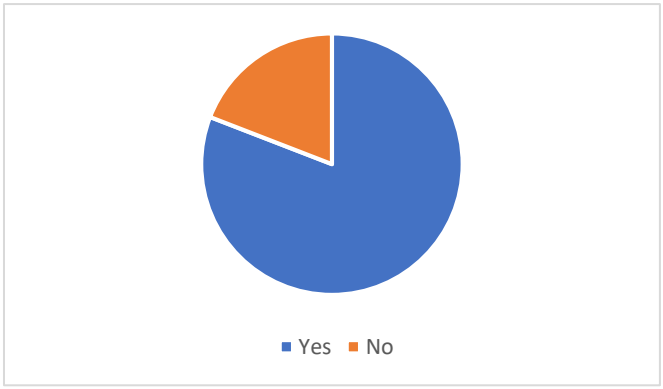

Figure 9. Do you work in your home country?

The oil industry is an international business and Equinor is gradually becoming more of an international company. This also pertains to the composition of the work force onshore Norway where a substantial fraction of the employees are foreigners (Figure 9).

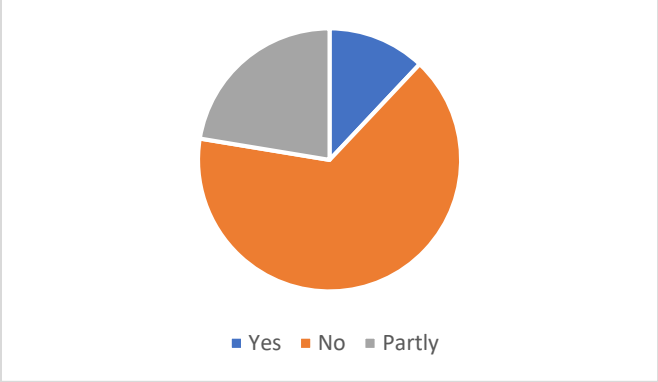

Figure 10. Are you responsible for security?

Security being vital to the company, a substantial fraction of the employees have jobs where they are partly or fully responsible for security. Thus, we have sufficient number of respondents to say something on how security personnel risk perceptions differ from other personnel, see Figure 10.

Figure 11. Have you the last five years spent more than 25 per cent of your working time on projects outside Norway?

With half the production taking place abroad there is considerable labour mobility and Norwegian employees spend much time on foreign projects, as illustrated by Figure 11. This renders relevance to the idea that evacuation drills may be beneficial for Norwegian employees visiting foreign operations.

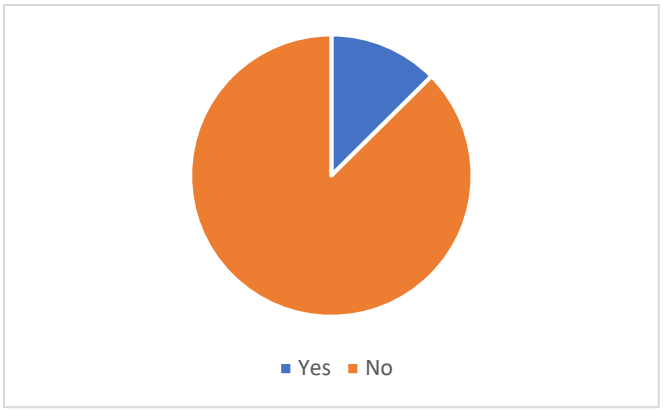

Figure 12. Do you travel more than 10 times a year outside Norway in connection with your work?

Norwegians that are to stay at a certain foreign location for a longer time period receives a curtailed security training program, so the relevance of the Norwegian evacuation drills are primarily for employees that visit foreign operation on an irregular basis. This pertains to a considerable group of employees, see figure 12.

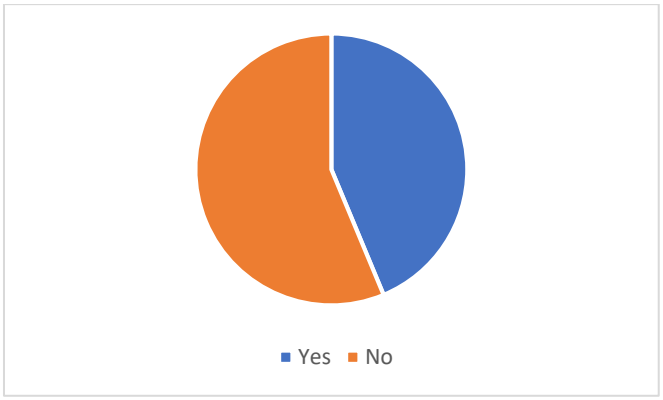

Figure 13. Have you worked offshore?

A large fraction of the employees has worked offshore, and the data may shed light on whether this group have different perceptions of risk or other views on security drills (Figure 13).

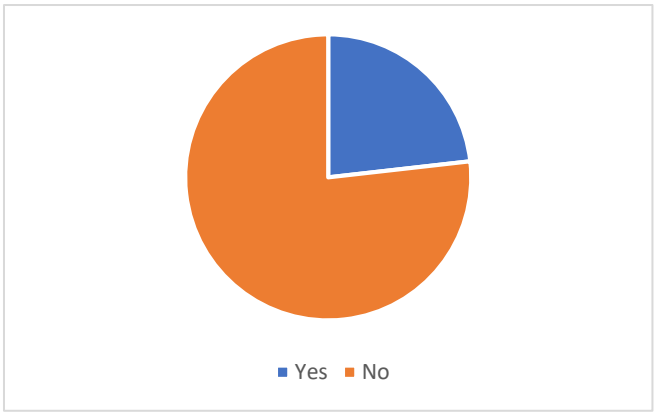

Figure 14. Do you have experience from emergency response and evacuation from the armed forces, the Red Cross or similar?

Figure 14 reveals that a considerable fraction of the employees have experience from emergency response and evacuation from other sectors, and this control variable allows us to account for that. Experience from other sectors may potentially affect views on security risk and drills.

6.1.1 Employee risk perception

We have now been through the control variables and turn to the main questions of the survey. Figures 15 to 21 depict key issues when it comes to employee risk perception.

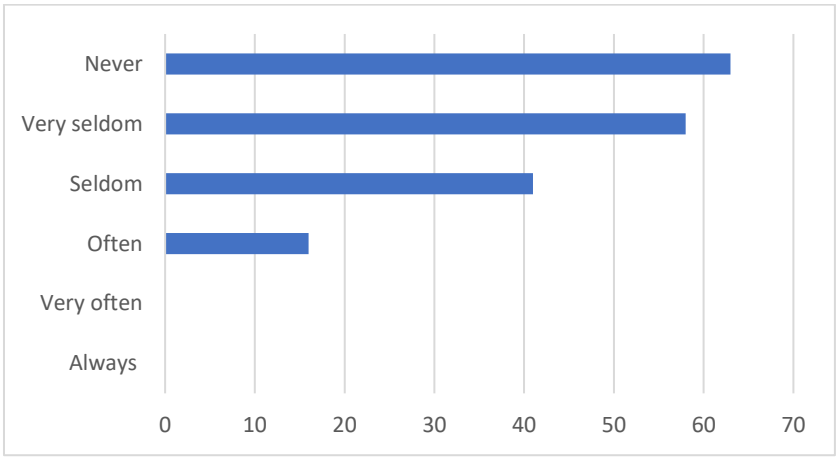

Figure 15. Do you fear that your workplace is a terrorist target?

The background for the introduction of the *run, hide, fight* evacuation routine is the recognition that a high profiled multinational energy company may represent a terrorist target.

A significant part of the respondents fears that this may be the case, although most of them only seldom experience fear, see Figure 15. None of the respondents fears this very often or always, and a large majority never or very seldom experience such fear.

The list of demographic and occupational control variables allows us to check how the answers are distributed among various groups of employees. Some of the major findings are reported here.

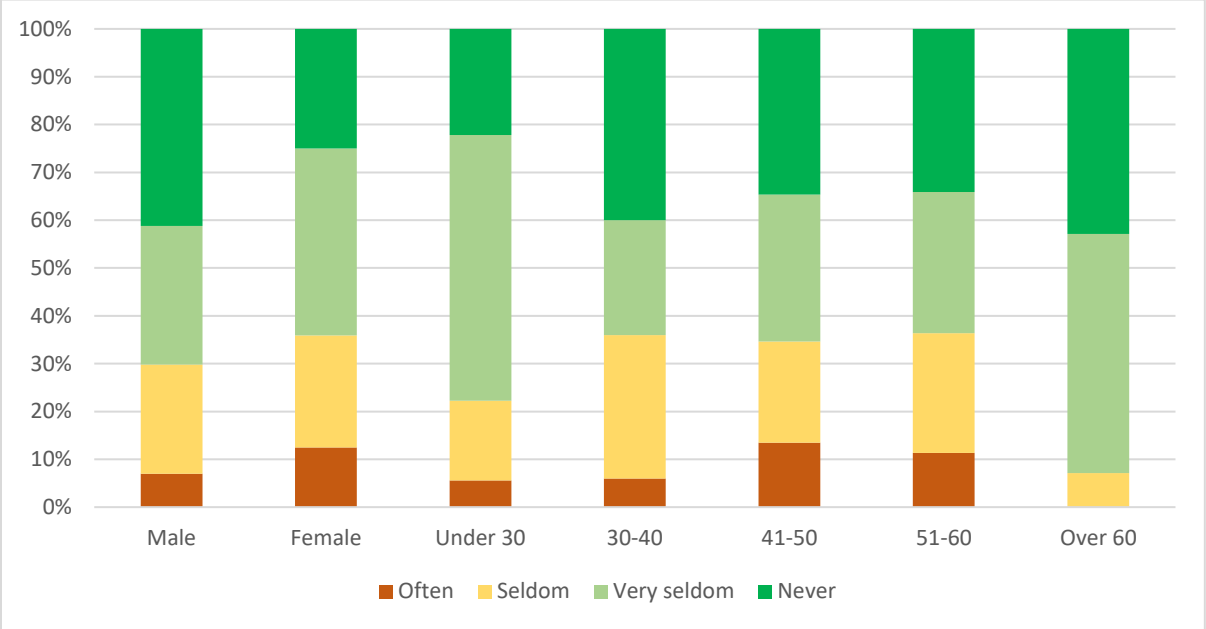

Figure 16. Fear of workplace as terrorist target, distribution according to demographic control variables.

In Figure 16 I do not list the categories *very often* and *always*, that none responded. The figure shows that the eldest and then the youngest employees have lowest fear of the workplace being a terrorist target. Female employees have slightly higher fear of the workplace being a terrorist target than men, though the data shows that this does not apply to the youngest women.

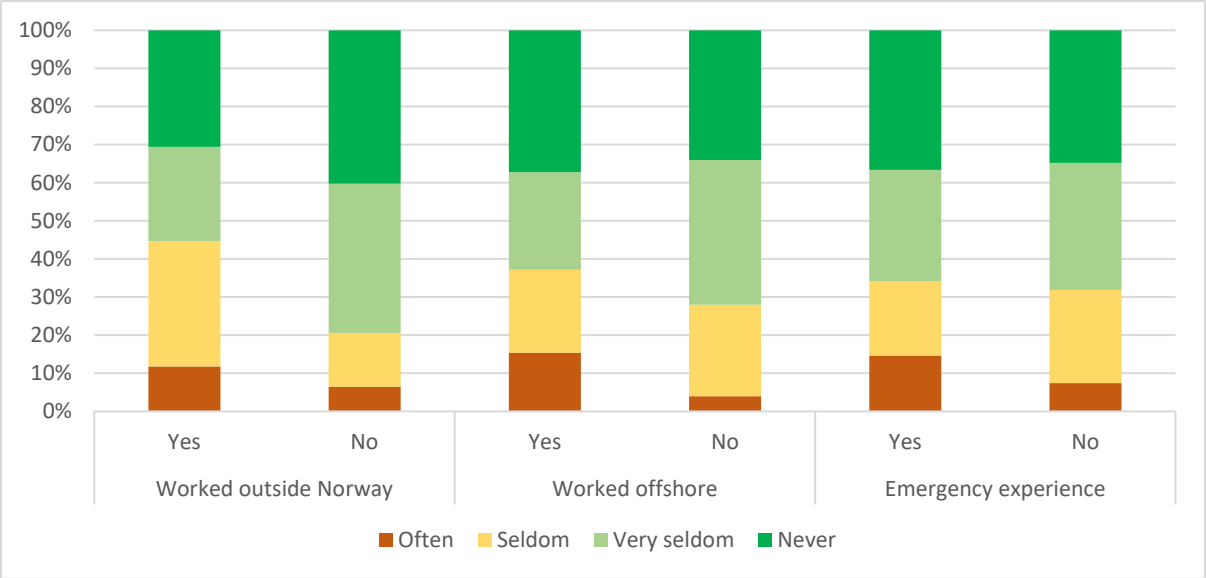

Figure 17. Fear of workplace as terrorist target, distribution according to occupational control variables.

Figure 17 shows that employees that have worked outside Norway or worked offshore have a higher fear for the workplace being a terrorist target.

The survey data also shows that security personnel has a much higher score on the category *seldom* than other occupational groups, but also differ from the other groups by none respondents reporting that they *often* have fear of the workplace as a terrorist target. Thus, the employee group that has most knowledge on the matter recognises the potential for terrorist attack to a larger extent but assign it a low probability. Caution should be made that there are few respondents in this group (6 employees).

Recognising that your workplace might be a terrorist target is not the same as being afraid at work. The latter is pictured in Figure 18.

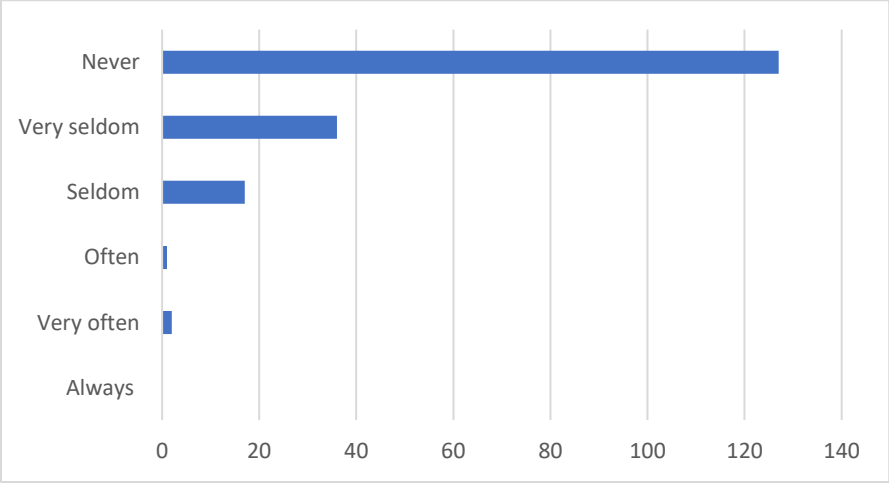

Figure 18. have you felt afraid at work?

Comparing figures 15 and 18, we see that although a considerable part of the employees recognises the potential for terrorist attack, few are actually afraid at work. The data shows that 69 % of the employees are never afraid at work and 20 % are very seldom afraid; summing up to 89 %.

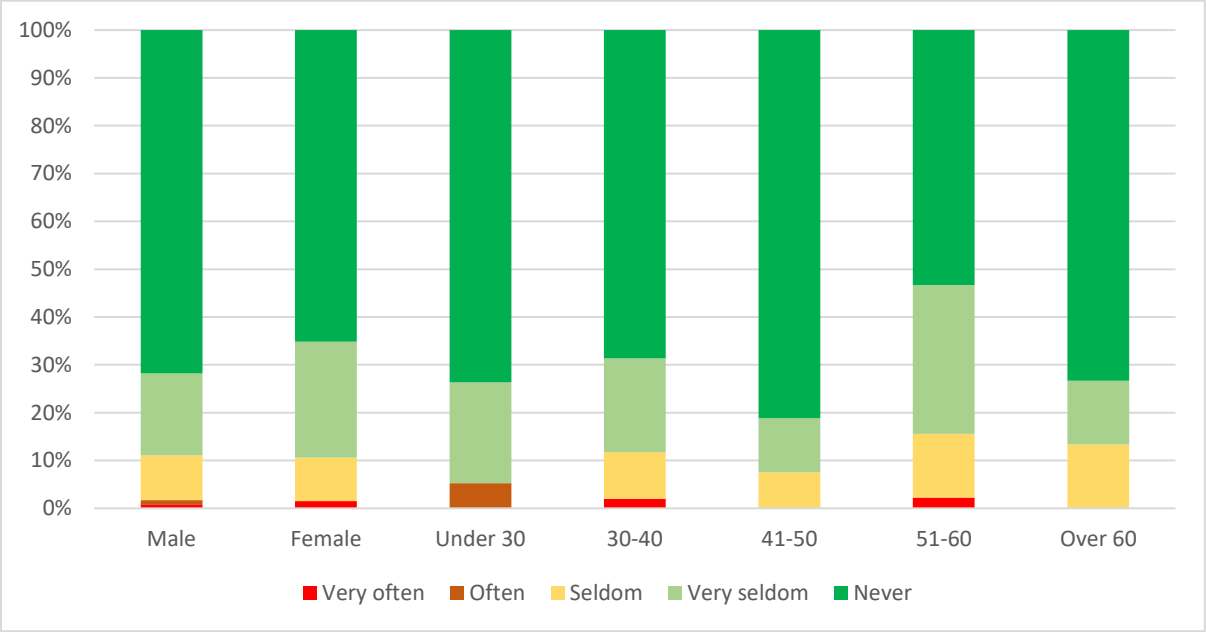

Figure 19. Fear at the workplace; distribution according to demographic control variables.

We see from figure 19 that fear is fairly evenly distributed among men and women. Although a large majority of employees feels safe, fear is not negligible. For all respondents, 11 % of the employees' experience fear very often, often or seldom, although for the most part the fear is seldom (9 %). The age group "Under 30" stands out, with only around 5% experiencing fear. This is of relevance since one concern is that this kind of fear should deter recruitment of young employees. Caution should be made that there are fewer observations in this category. Of 19 employees in this category, only one experienced fear.

Again, we find that employees that have worked outside Norway or offshore, experience more fear than the others. This finding allows for several potential explanations. Having worked in contexts with actually higher risk they are probably more conscious of true risk, or having gone through tough and realistic emergency drills in their previous positions, they assign a higher probability to adverse outcomes than is actually the case.

Fear is fairly evenly distributed among various occupations and ranks. Security personnel again stands out, with the majority experiencing fear, although seldom. Again, caution should be made about few observations in this category (6 employees).

6.1.2 Drills do not induce fear

A crucial question of this thesis is whether drills affect the employees' perception of terror risk. As depicted in Figure 20, the general finding is that this is not the case.

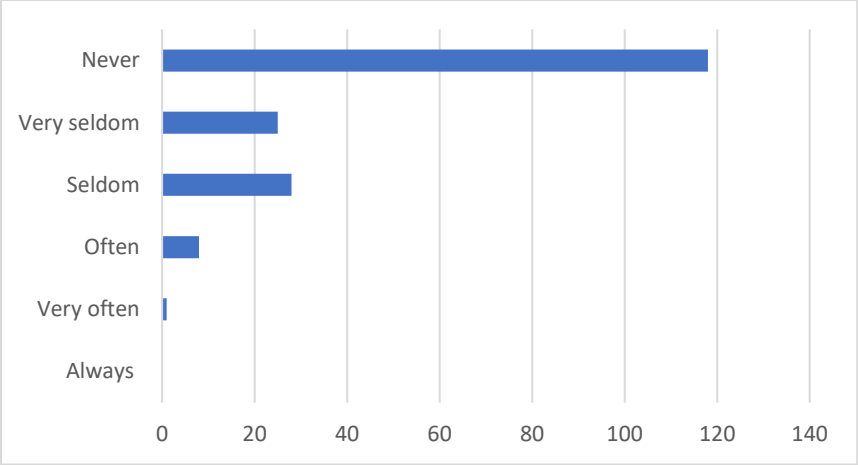

Figure 20. Are you more afraid after drills?

Only 9 employees are often more afraid after drills. Again, the issue is not negligible, as a fairly large percentage of the employees is sometimes more afraid after drills, see Figure 21.

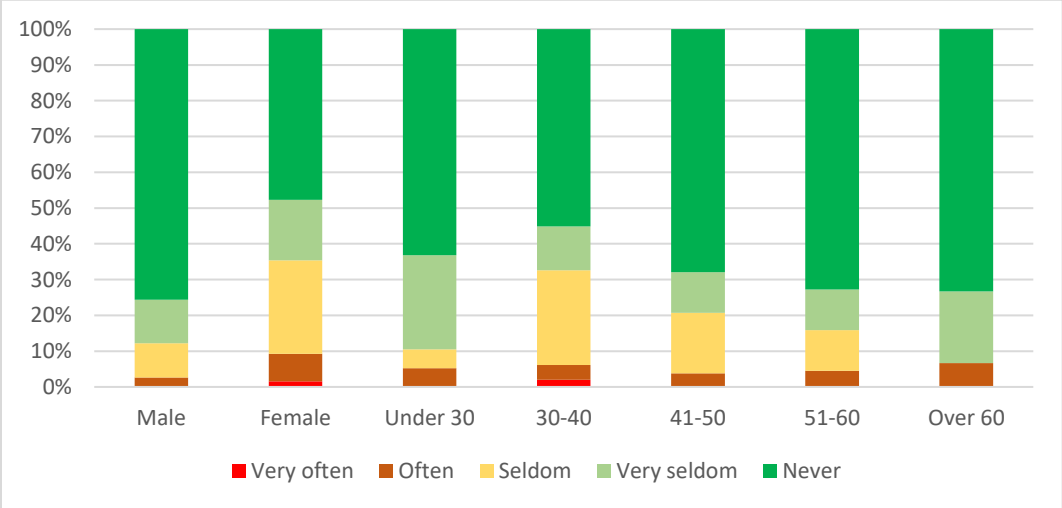

Figure 21. Are you more afraid after drills; distribution according to demographic control variables.

Gender plays a role here, with a considerably higher fraction of the female employees being more afraid after drills than men. Although only seldom for most of them, not more than 10 per cent of female employees are often or very often more afraid after drills. This is a finding to note for a company that strives for a more equal gender distribution. According to the men's report, they are considerably less afraid after drills.

It is the age group 30-40 that has the highest fraction of employees that are more afraid after drills, though primarily seldom. Again, elderly (60+) and young employees (30-) are considerably less afraid than the other employee groups, with a caveat about few respondents in these group. As for occupational distribution, security personnel are more afraid after drills than other occupational groups.

6.1.3 Added benefit of security drills

Additionally, the data shows that a large majority of the employees consents with the question "could security drills be useful for dealing with terrorist threats when you are on holiday? This indicates added benefits of the security drills.

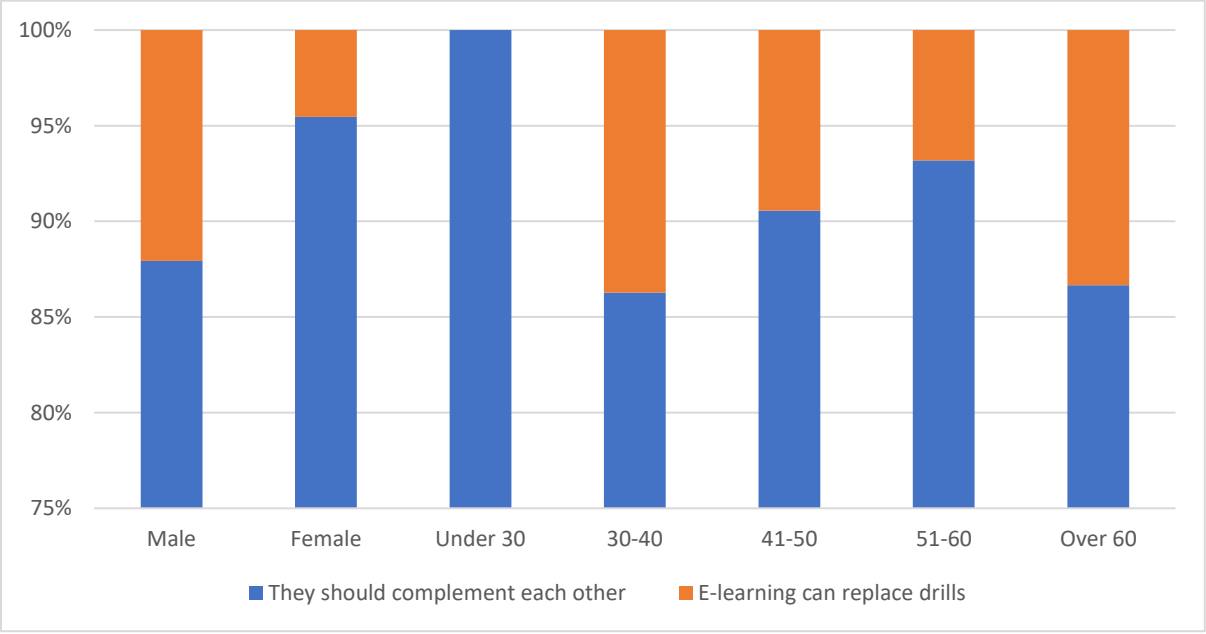

Figure 21. What should be the relationship between e-learning courses and drills on *run, hide, fight*?

6.1.4 E-learning versus drills

A recurring question is the relationship between e-learning and drills. We see from Figure 20 that a large majority of the respondents believe that drills are necessary. An interesting finding is that none of the youngest respondents believe that e-learning can replace drills, a view shared by security personnel.

To the question "How often should e-learning courses take place?", close to half the respondents replied once a year; see Figure 22. There was not much variation between demographical and professional control variables on this point.

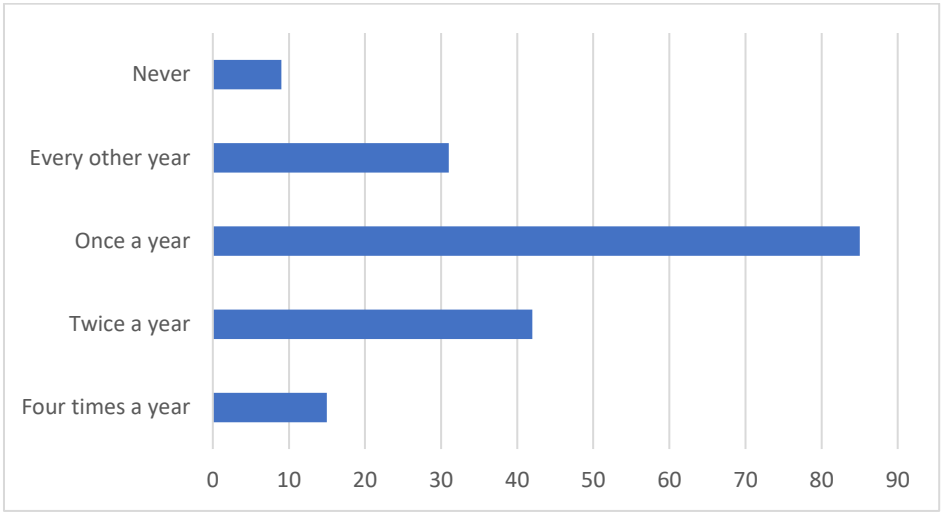

Figure 22. How often should drills on *run, hide, fight* take place?

Thus, the majority supports current policy. There is no systematic variation in the occupational variables, except for security personnel that only support drills once or twice a year, with a large majority for once a year.

A large majority of the respondents reply that they know what *run, hide, fight* involve, suggesting that the current learning schemes are effective. The respondents also believe that they are updated about possible security threats facing Equinor. A large majority also believes that adequate information has been provided on evacuation. The youngest employees are the group with the largest minority that asks for more information.

6.1.5 Summary

Summing up, the overall picture is that the evacuation drills and the supporting e-learning programmes seem successful in conveying the necessary information to the employees. A

fairly large share of the Equinor employees recognises that their company might represent a terror target, but they are generally not afraid at work. A minority do express fear, however, so this problem is not negligible. A large majority of the employees do not become more afraid after evacuation drills, and a majority of the employees supports the current level of drills and e-learning.

Equinor strives to get a better age and gender balance among its employees, which implies active recruitment of women and young personnel. Does the evacuation drills and the e-learning represent a particular deterrent for these personnel groups? Relatively to men, women are more afraid after security drills, even though this only applies to a minority. For young personnel it is the other way around, this group expresses the lowest level of fear and are less afraid after drills. This also applies to young women. A considerable fraction of the young employees requests more information, indicating a potential need for supplementary security education particularly for this group.

6.2 Main findings of semi-structured interviews with Equinor stakeholders

To achieve a better understanding of differing attitudes to evacuation routines, training and so forth, I conducted semi-structured interviews with three Equinor security stakeholders. Starting questions were made available for the interviewees before I met them; see the appendix. In the following I report the main findings of the semi-structured interviews, organised according to the main topics addressed.

6.2.1 Floor supervisors, information on security threats and training

The interviewees noted that personnel designated to deal with evacuations – known as floor supervisors – are volunteers. They usually wear yellow jackets in such circumstances in order to be recognised by other personnel, and their main job is to get everyone out of the building. They must then go through the premises to check. In addition, comes an emergency response team – where the emergency response duty officer is one of two duty officers – who work a fixed rotation and are called in should an emergency arise.

"*We actually have all the resources available for handling a possible evacuation, depending on what prompts it – fire, attack or other incidents*," says the emergency response duty officer.

Education and information on potential security threats required by such personnel was another point raised. The representative for Industry Energy knows little about this, since he has never been a floor supervisor. The chief safety delegate says that one of their complaints

is that the training given to such supervisors is not good enough. They receive an introductory course but used to get more extensive training from the fire brigade. At present, she believes the only form of education provided is through e-learning. The emergency response department has a dedicated leadership, whose members must undergo training to be included in the group. They also have monthly meetings with training and are informed about threats and the current threat level.

"*The national government handles the security threat assessment, and Equinor also receives information which gets passed on*," the emergency response duty officer explains.

6.2.2 Evacuation training and information of security threats to other personnel

Where personnel other than the floor supervisors are concerned, training and information about potential security threats are provided through *run, hide, fight* exercises, which are mostly based on e-learning. A video exists which includes how people should deal with intruders. According to the chief safety delegate, this was introduced particularly after the In Amenas incident in Algeria. When circumstances arise where people must leave the building, they are meant to disperse. This is explained both in the above-mentioned video and in connection with other training. Employees are otherwise informed how to behave inside the building, how to get out, and how to behave once outside. However, the chief safety delegate is not always satisfied with the commitment of employees when physical drills are carried out.

The chief safety delegate was asked to explain the most important consideration for safety delegates where evacuation routines are concerned.

"*It's equally important for us and for all employees that people get out and that they understand why we're evacuating*," the chief safety delegate says.

"In addition, employees must see the need for this. It's also important for us that they understand the point of dispersing after they've got out of the building. If it's raining, for example, a lot of people congregate under a bike shed during evacuation drills instead of dispersing. We in the safety organisation are also concerned to ensure that people feel safe and secure and take a chat with those who need it. For now, I don't feel the evacuation drills are too numerous, at any rate."

6.2.3 Can drills spread an unwarranted sense of fear

Opinions differ among the interviewees on how far frequent evacuation drills could spread an unwarranted sense of fear in the organisation. The union representative believes these exercises do more harm than good for the individual. Although they escaped on one occasion through a ground floor window, it was still a little high for some people who, he says, could have injured themselves on the window sill while exiting.

"*I remember we landed in some rose bushes with thorns and scratches involved." says the Industry Energy representative. "However, we chose the evacuation route, so this was not the organisers' fault.*"

He was asked about attitudes in the union to *run, hide, fight* and similar exercises.

"*I've only talked to two other people, so it's not representative*," he replies. "*Both shared my view that a physical drill is a bit too much, but video courses and other information measures are quite OK. However, we agreed that the physical measures which have been initiated to make the buildings more secure are positive*."

The chief safety delegate does not believe normal fire drills could spread an unwarranted sense of fear, but believes that some may undoubtedly be frightened by an exercise involving a fake intruder who runs around in the corridors and triggers an incident in their vicinity. According to her, that applies not only to Equinor but also to similar companies, since employees are not accustomed to this. However, she believes concerns can be allayed by providing a little information ahead of the drill. At the same time, people can train in finding places to hide.

The emergency response duty officer admits that frequent evacuation drills could risk spreading an unwarranted sense of fear in the organisation. At the same time, he believes that openness about the purpose can dissipate some of this concern. He also thinks that a general perception and assessment exists in their premises that the threat level is not high, but that 22 July 2011 is a reminder of what can happen. According to the emergency response duty officer, drills are important for that reason – not to generate fear, but to establish a sense of security. Overall, he does not feel this contributes to creating an unwarranted sense of fear.

6.2.4 Do employees perceive the level of risk to be higher than it actually is

None of the interviewees had a clear sense that employees perceive the level of risk to be higher than it actually is as a result of evacuation programmes and information campaigns.

The representative for Industry Energy believes that the "terrorist threat" to society in general is exaggerated. He maintains that some measures are fine, and that it is good the government monitors those who want to harm others, but that the statistics show the numbers affected are not large. Nevertheless, he makes it clear that such incidents are naturally terrible when they do happen, and that people should therefore be adequately prepared.

The chief safety delegate does not believe that employees perceive the level of risk to be higher than it actually is, based on Equinor' s evacuation programmes and information campaigns.

"*In a company with offices in many countries, and when we know there have been attacks in other countries, I believe a lot of people understand we have numerous locations where measures are necessary. I think that makes it easier to accomplish things here*."

The chief safety delegate also believes that, if people are going to travel to one of the offices abroad, it could be good to know something about these aspects. In addition, she thinks this could be rather easier for the company because it has the alibi of other locations which need such a security model.

The emergency response duty officer, too, does not believe that employees perceive the risk level as substantially higher, at least not where evacuation is concerned. If terror-related external attacks are the issue, he does not think this helps to create an exaggerated assessment of risk. At least, he does not get that sense from the people he encounters in his work.

6.2.5 Can unwarranted fear of terror weaken recruitment

None of the three believe such fears could weaken recruitment to Equinor. The Industry Energy representative points out that people vary and react in different ways but considers it more likely that new graduates will reject the company because of climate and environmental issues. He believes that these weighs more heavily with young people when applying for jobs. Nor does the chief safety delegate think security worries will contribute to weakening recruitment. She believes youngsters are more enlightened than that, but older people could be more easily swayed.

"*We have 4 500 employees here in Stavanger, which is obviously a cross section of the population," she says. "Many people undoubtedly think this is unnecessary and that nothing will ever happen here. However, I don't think it goes as far as demotivating employees*."

Nor does the chief safety delegate believe that applicants are particularly fearful. But she thinks people began to be a little afraid when they were on their way to work and saw Equinor was starting to install bollards outside the entrances. Nevertheless, she believes they realised that the company was taking precautions to prevent possible undesirable incidents at Forus. The emergency response duty officer points out that discussing the issue with family, friends and others around them can help to prevent people applying for a job with Equinor or similar companies. He adds that several major international companies are undoubtedly potential targets for terrorists. In Amenas was an example of this. But he does not think the assessment of the terror risk is so great in Norway that it might prevent people applying to the company.

6.2.6 The balance between training and spreading unwarranted fear

Another relevant issue is how Equinor should handle the balance between personnel being ready and able to evacuate while not spreading unwarranted alarm. The representative for Industry Energy believes it could be a bit over the top to deal with all this in detail, and that it is enough to mention a few examples. In his view, providing brief information on the procedures is enough since everyone can imagine what it might involve without being spoon-fed. If the threat of explosion is the issue, people at the plants and offshore live with this on a daily basis. It is also a threat and a hazard. It occurs infrequently but can happen.

The chief safety delegate notes that Equinor deals with this at present by having three lines of emergency response – first, second and third. It also holds a relatively large number of emergency drills, and otherwise has dedicated personnel to call loved ones. The company has a big organisation which, according to her, not so many ordinary employees know about or deal with in their daily lives. She believes it is very well organised based on reports she has received from the drills, provided by all levels from top management to ordinary employees.

The emergency response duty officer feels Equinor is very good at being open on the reasons why time and resources are spent on this.

"*The key requirement here is to get across the importance of practising in peacetime and that the real threat picture is what it is, and quite simply to talk about this. It's important to be sufficiently hands-on with the individual employee in order to identify those who may find this unpleasant. The run, hide, fight drills are clearly distressing for some*."

He is asked how directly he is involved in the changes to the evacuation routines as one of the two response officers.

"I don't participate in shaping the response routines," he responds. *"That's the job of a dedicated security staff. However, we're involved in drilling, evaluation and giving feedback. We contribute to evaluation of the drills we take part in and can exert influence if changes are needed and when routine descriptions and management documentation get reviewed*."

The emergency response duty officer adds that this is a matter of being reminded about what could actually happen and believes that openness and drilling is important here. He believes Equinor does a lot of things well in terms of openness in the organisation, being hands-on with people and responding to individuals who react negatively to the drills.

6.2.7 How often should *run, hide, fight* drills take place

One question where some disagreement exists between the interviewees is how often *run, hide, fight* drills should take place. The emergency response duty officer believes this should optimally be done annually, since he believes that would pick up newcomers to the workforce. The chief safety delegate takes the view that they should be conducted at least once or twice a year because working at Forus is one thing, but people could also benefit from lessons learnt in these drills at home, on business trips and when travelling privately. Many visit London, for example, or other places with a much higher terrorism potential than Stavanger. She does not think any great disadvantages would be suffered by holding this drill a few times a year. However, the representative for Industry Energy feels that e-learning is enough and proposes that people could receive a reminder every other year or similar interval. He makes it clear that a small refresher could be appropriate, but not through physical drills. The chief safety delegate thinks that the importance of physical *run, hide, fight* drills lies in the fact that the experience of evacuating the building, getting out, discovering that a crush develops when many are trying to leave at once and so forth cannot be replaced by an e-learning course. At the same time, she believes the latter represents a fine supplement.

She gets backing from the emergency response duty officer:

"*It's easy to sit at a computer and run a digital role-play. When you emerge into the corridor and suddenly see somebody running towards you, or you observe a lot of smoke, you get a very different feeling. A cold shiver runs down your spine, which wouldn't be the case if we were doing an evacuation drill*."

6.2.8 Should drills also prepare employees for work assignments or holiday abroad

According to the union representative, the issue of how far training and information should also take account of preparing employees for a stay abroad has two aspects. One concerns the greater likelihood of security incidents when personnel visit or work at Equinor offices abroad. The representative for Industry Energy says that Equinor has some general guidelines which advise people preferably to avoid attracting attention. Do not carry a suitcase with an Equinor logo or the like, and do all you can to conceal who you work for – not necessarily because somebody wants to harm you, but because they may want to spy on you and steal industrial secrets or the like. People must be careful who they talk to in public and where they use their phone or laptop and must use secure networks. Employees are briefed on this kind of security, and courses are available – including on IT security, which the representative for Industry Energy works with. He believes this is relevant, but also thinks it is going a bit far to spoil people's holiday pleasure and remind them that terrorists could kill them abroad.

The chief safety delegate notes that tailored educational sessions are provided when people travel abroad, depending on the country concerned. Dedicated security and separate HSE courses are available for those travelling to countries with a medium to high risk of an incident.

"*It's important that people who are going to travel to a high-risk country are equipped to deal with this*," she says. "*Responsibility for visitor security rests always with the local emergency response organisation in countries where Equinor has offices*."

The emergency response duty officer also believes tailored programmes are necessary for people going to specific countries exposed to risk, such as Algeria and Korea.

The other aspect of this issue relates to employees on holiday abroad without any connection to their work. The emergency response duty officer believes it should be enough here to provide an evacuation exercise once or twice a year. The chief safety delegate thinks the training and information given in a job context provides employees with a competence which is also important and relevant for private travel. She also hears this from others when they go away. They are more aware of themselves, their possessions and their surroundings than when they travelled a number of years ago. The representative for Industry Energy emphasises that Equinor has a collaboration with the foreign ministry, which provides advice on the precautions people should take when visiting various countries.

7 Discussion

Terror risk is associated with social amplification. This thesis examines to what extent Equinor has been able to dampen this effect, while at the same time prepare the employees for a potential terror incident. To address this question, I have discussed relevant theory and I have undertaken quantitative and qualitative empirical studies. In the following, I discuss the findings.

7.1 Two strands of literature; security theory versus empirical applications

In the literature presentation in Section 3, I surveyed two strands of literature. One is a theoretical direction comprising overarching and critical discussions of trade-offs within security prevention and management. The other is empirical oriented studies on terror prevention and incidence handling from specific sectors. The latter do not discuss costs of security measures or the trade-offs involved, they merely report on actual incidents and the system needed to govern security. Both strands of literature cast light on the research question raised in this thesis. The theory addresses the big picture and the empirical literature derives lessons from specific incidents. When trying to understand the difference in the perspectives one should of course note the distinction between theoretical and empirical research. The distinction is here larger than in many other research fields, where the empirical research to a larger extent has a theoretical foundation. But we should also be aware of the context. Whereas the theoretical literature presented in section 3 to a large extent is general, applying to all types of industries or government administration, the empirical literature presented is typically from sectors of society where terror incidents have taken place and also do so on a regular basis. That, of course, is a quite different perspective than in Norway. Some of the trade-offs are not there, i.e., a high focus on security is self-evident, or rather that the trade-off is on the side of high security awareness.

A caveat is that research from areas and sectors with a high frequency of terror incidence is not necessarily transferrable to a Stavanger setting with no such incidents. While a frequent and realistic terror evacuation drills may make employees feel safer in such areas, this is not necessarily the case in a Norwegian context. Institutions in a high-risk area or sector does perhaps not, as a Norwegian company, to the same extent have to worry about secondary or ripple effect of employees assigning a higher probability to terror incidents as it is high in the first place.

Returning to the research question of analysing the trade-offs in security for Equinor Norwegian offices, we should thus be wary of automatically absorbing all advice from the most security exposed US sectors, where incidents are more frequent. Being located in a safe country the risk is lower and thus the trade-off generates a different optimal solution. An important distinction is here to be made between security personnel and regular personnel, where the former needs a higher awareness than the latter. The downside of too high emphasis on security issues may make employees infer a higher risk than what is actually the case, which may harm motivation and recruitment. A cyclical industry that has challenges with layoffs in recessions and that struggles with its public image in the climate debate, must pay particular attention to factors that may potentially harm recruitment.

7.2 Analogies from the safety literature

I make use of analogies from the safety literature. In this literature they point to the problem that employee tends to assign a too low probability to safety risk pertaining to incidents that only takes place at very rare occasions. To the extent that findings from this strand of safety research is transferrable to employees' risk perception of terror risk, one may actually argue for more frequent security drills. Like parts of technical safety risk, terror risk has low probability. However, there are features about terror risk that distinguish terror security from many aspects of technical safety; it is

- Perceived as unfair to innocent victims
- An outside threat
- Characterised by a risk probability that to a large extent is outside the control sphere of the company

Compared with safety risk, terror risk cannot be measured, managed and controlled. It is therefore not straight forward to use analogies from safety theory, where there often are more risk events and experience and where the problem to a larger extent can be measured and controlled. These particular properties of security risk associated with terror make it particularly exposed to social amplification. Hence, the challenges related to risk perception is different from safety matters.

Moreover, the general theory that stems from all types of industry and administration, may fail to consider particular security issues pertaining to global oil industry. Oil companies are often located in high risk countries, and a company like Equinor has a high profile. The

security trade-offs may differ from an average Norwegian context, and the optimal solution may have a higher emphasis on security.

The basic issue of risk perception, that regular employees are likely to derive or update their probability for security incidents from the company's communication and activity on security drills etc., is also likely to differ between sectors and regions. In a sector and a country that is perceived fairly safe, like Equinor offices at Forus, frequent and graphic security drills may raise concern by employees. For employees at institutions and companies in regions of frequent terror attacks, a tough security regime may have a different effect on the employees in terms on recruitment and motivation. Thus, the trade-offs are obviously not the same.

7.3 The theory on social amplification of risk

Other major oil companies in Rogaland have abstained from terror drills at their onshore offices, with the explanation that it may generate unwarranted fear among the employees. The theory on social amplification seems to be relevant in this context. This theory explains why risk that appears as minor according to technical experts sometimes generate strong public reactions. Their main thesis of this theory is that there is an interaction between risk events and social, psychological and cultural processes in a way that can heighten public risk perception. Drawing on communication theory they refer to this as social amplification of risk, in which repercussions of individual and group perceptions may generate an unwarranted picture of high risk. A hypothesis in the safety literature is that employees may undervalue risk due to lack of experience when it comes to events with a very low probability. In the theory on social amplification of risk, people filter and interpret signals while interacting with their peers and social groups. This is often understood so that the employees overestimate actual risk, and that companies and government need to account for these higher-order impacts. This interpretation may be due to the cases analysed in this literature, e.g., nuclear accidents. Terror security risk may share some of the same features, e.g., dramatic and unfair consequences for innocent victims. However, the theory also opens for individuals to underestimate risk, referred to as social attenuation of risk.

7.4 Safety theory complements the theory on social amplification of risk

There may be an interesting connection between the theory on social amplification of risk and safety theory. They seem to share a belief that researchers must go behind cognitive elements

in understanding employee risk perception and also recognising affective components. The shift in the risk theory literature in understanding risk behaviour and perception from individual psychological explanations to sociological and organisational frameworks, also seems to share common ground with the theory on social amplification of risk.

One important point where the two theories seem to depart is that while the safety literature to a large extent focuses on risk behaviour, the theory on social amplification of risk is concerned with the risk probabilities assigned by individuals. It is the latter that is relevant to my thesis. It does not address behaviour but is concerned with the probability of terror attack assigned by the employees and how this may be affected by terror evacuation drills, with potential secondary or ripple effects for motivation and recruitment. The safety literature obviously has much to offer in analysis of security settings. For instance, the finding of Rundmo (2000) that behaviour was influenced by rational risk judgements, and not by insecurity and worry, is highly relevant to design of evacuations plans. However, this is outside the topic of my thesis, and I find the theory on social amplification or attenuation of risk to be the most relevant theoretical framework for my research question.

Another point where the two strands of literature seem to concur is in the question on whether management is able to impact the employees' risk perception. In my setting, the social amplification or attenuation to a large extent is an internal company process, clearly affected by management initiative and communication, and by employee participation and involvement in the process. How security drills are presented, communicated and executed, and to which extent employees and their representatives are involved at an early stage, clearly affect risk perception. Interesting findings in Rundmo (2000) is that risk perception was an endogenous variable, and that supervisor involvement in safety work was strongly correlated with rational judgement of risk. This element is crucial to my research topic.

In line with the discussion above I selected the theory of social amplification of risk as the basic theoretical framework for the thesis. I open up for the potential for managers to influence the process - through their involvement, including the presentation, communication and execution of safety drills – and I open for employee involvement and participation in the process.

While working to influence the social amplification of risk, one should also dampen potential social attenuation of risk. It is useful to pay attention to one of the paradoxes from the safety literature. If risk perception become too low, it is possible to reach a level of unwarranted

safety. This may reduce safety, and analogously security, because people forget or lose interest in taking responsibility for their own security. The challenge is to design information and drills in ways that keep the employees alert without causing unwarranted fear.

7.5 Questionnaire for Equinor employees and semi-structured interviews with key risk stakeholders

The theoretical approach in this master thesis has been complemented by quantitative (questionnaire) and qualitative (semi-structured interviews) data. The questionnaire has a balanced (representative) panel of 183 respondents and has the potential of providing good descriptive statistics on the employees' attitude to the trade-offs related to security drills. This quantitative approach provides correlations (what) but not cause and effect (why). For this end I have theory and the semi-structured interviews.

An interesting question is whether Equinor has been able to dampen social amplification of risk when introducing the *run, hide, fight* evacuation scheme. According to the answers to the questionnaire, Equinor employees recognise that their company may represent a terrorist target, but a large majority is not afraid at work and a large majority have not become more afraid after the *run, hide, fight* evacuation drill. A small minority is afraid, and a few respondents report that the drill made them afraid, so the problem is not negligible. None of the experts that were interviewed believed that employees perceive the level of risk to be higher than it actually is, as a result of evacuation programmes and information campaigns. None of them believe that security training could weaken recruitment to Equinor. The experts explain in the semi-structured interviews that social amplification of risk was dampened by the following measures:

- Clear communication in advance of the drill
- Openness about the purpose of the drill
- An undramatic drill design
- By being sufficiently hands-on with the individual employee to identify those who may find this unpleasant.

Thus, the company seems to have dampened social amplification of risk, as portrayed in Figure 1, by means of worker involvement, management initiative and good communication. This seems to indicate that risk perception is endogenous in this setting.

Equinor follows a differentiated educational programme for security for groups with different security ranks and roles. The web interview indicates that the employees are updated on the potential threats to the company and that they know the necessary elements in the *run, hide fight evacuation* scheme. The floor supervisors have an additional program that prepare them for their task in case of evacuation and those responsible for security have much education and training.

Overall, the current policy of annual drills complemented by e-learning have broad support, though there is variation in the answers. Some respondents to the questionnaire want more training, other less. The experts interviewed support the current policy, with the exception of the trade union representative who proposes that e-learning is sufficient since the employees know what to do and the drill poses strain on the employees.

7.6 The trade-off between evacuation skills and fear

What do the empirical findings say about Equinor's ability to find the right trade-off between a necessary level of skills relating to security threats and evacuation procedures on the one hand, and the possibility of generating fear among the personnel on the other? There is some fear in the organisation, though only by a small minority. The employees report that they have the necessary knowledge for a possible evacuation, and this is confirmed by the emergency response duty officer. Some employees, as well as the chief safety delegate, request more information for particular groups. These are probably indications that Equinor has managed to strike a balance between the objectives of security knowledge and not raising unwarranted fear. Situations where no employee experienced fear or where no employee requested more training would represent corner solutions where one of the objectives was pursued at the expense of the other.

7.7 Potential for improvement

As for potential improvements, the young employees responding to the questionnaire request more education and training, so Equinor might consider a targeted program for this group. To dampen unnecessary fear general training could be kept to a minimum while giving extra security education to those groups that request it. The chief safety delegate requests better training for the floor supervisors.

Literature

Bentley, T.A. and Haslam, R.A. (2001), "A comparison of safety practices used by managers of high and low accident rate postal delivery offices", *Safety Science* 37, 19-37.

Brown, R. D. (2013). *Dying on the Job: Murder and Mayhem in the American Workplace*. Lanham. Rowman & Littlefield.

California Occupational Safety and Health Administration (Cal/OSHA) (1995). *Cal/OSHA Guidelines for Workplace Security.* San Francisco, CA. State of California Department of Industrial Relations, Californian Division of Occupational Safety and Health. http://www.dir.ca.gov/dosh/dosh_publications/worksecurity.html.

Calhoun, F. S. and Weston, S. W. (2013). *Concepts and Case Studies in Threat Management*. Boca Raton, FL. CRC Press.

Chappell, D. and Di Martino, V. (2000). *Violence at Work*. 2nd edition. Geneva. ILO. http://www.ilo.org/public/libdoc/ilo/2000/100B09_67_engl.pdf.

Chappell, D. and Di Martino, V. (2006). *Violence at Work*. 3rd edition. Geneva. ILO. http://www.ilo.org/public/libdoc/ilo/2006/106B09_110_engl.pdf.

Clarke, L. (2002). "Panic. Myth or reality?" *Contexts* 1 (3): 21-26.

Couper, M. P. and Hansen, S. E. (2002). "Computer-assisted interviewing". In Gubrium, J. F. and Holstein, J.A. (eds), *Handbook of interview research.* Thousand Oaks, CA. Sage: 557–575.

Dabrowski, M., Sip, M., Rogozinski, D., Serniak, B, Czarny, D. and Sanak, T. (2017), "Active shooter – how close are they?", *Disaster and Emergency Medicine Journal* 2017, Vol. 2, No. 2, 69–73.

Ellies, S. K. (2015). *Evaluating an active shooter curriculum for institutions of higher learning*. PhD thesis, University of Pittsburgh, 2015.

Elmholdt, C. (2006). "Cyberspace alternativer til ansigt-til-ansigt interviewet". *Tidsskrift for kvalitativ metodeudvikling*, 41: 70-80.

Engen, Ole Andreas, Kruke, Bjørn Ivar, Olsen, Odd Einar, Olsen, Kjell Harald, Lindøe, Preben and Pettersen, Kenneth (2016), *Perspektiver på Samfunnssikkerhet*, Oslo: Cappelen Damm.

Epstein, S. (1984). "Controversial issues in emotional theory". In: Shaver, P. (ed), *Review of Personality and Social Psychology, Emotions, Relationships, and Health* Volume 5. Beverly Hills, CA. Sage: 64-99.

Farmer, A. and Tiefenthaler, J. (2004). "The Employment Effects of Domestic Violence". *Research in Labour Economics*, 23: 301,334.

FBI (2002). *Workplace Violence: Issues in Response*. Quantico, VA. US Department of Justice, http://www.fbi.gov/stats-services/publications/workplace-violence.

Fisher, B. S. and Peek-Asa, C. (2005). "Domestic Violence and the Workplace: Do We Know Too Much of Nothing?". In: Bowie, V., Fisher, B.S. and Cooper, C. (eds) *Workplace Violence: Issues, Trends, and Strategies*. Collumpton, UK. Willian: 97-120.

Gill, Martin. (2014). *The Handbook of Security* (2nd edition). London. Palgrave Macmillan UK.

Healthcare and Public Health Sector Coordinating Council, FBI (2015). *Active shooter planning and response in a healthcare setting.* https://www.fbi.gov/filerepository/active_shooter_planning_and_response_in_a_healthcare_setting_2015.pdf/view.

Hoel, H., Sparks, K. and Cooper, C. L. (2001). *The cost of Violence/Stress at Work and the Benefits of a Violence/Stress-Free Working Environment*. Report commissioned by the ILO, Geneva. http://www.ilo.org/public/english/protection/safework/whpwb/econo/costs.pdf.

James, N. and Busher, H. (2012). "Internet interviewing". In Gubrium, J. F., Holstein, J.A., Marvasti, A. B. and McKinney, K.D. (eds), *Handbook of interview research: The complexity of the craft* (2nd edition). Thousand Oaks, CA. Sage: 177-191.

Jeffery, C. R. (1971). *Crime Prevention Through Environmental Design*. Beverly Hills, CA. Sage.

Jenkins, E. L., Fisher, B. S. and Hartley, D. (2012). "Safe and Secure at Work?: Findings from the 2002 Workplace Risk Supplement". *Work*, 42: 57-66.

Kasperson, R.E., Renn, O., Slovic, P., Brown, H.S., Emel, J., Goble, R., Kasperson, J.X., and S. Ratick (1988), "The social amplification of risk: a conceptual framework", *Risk Analysis*, 8, 2, 177-187.

Kasperson, J.X., Kasperson, R.E., Pidgeon, N.F. and P. Slovic (2003), "The social amplification of risk. Assessing fifteen years of research and theory", in N.F. Pidgeon, R.K. Kasperson and P. Slovic (eds), *The social amplification of risk*, Cambridge University Press, Cambridge, UK, pp 13-46.

Kelen G. D., Catlett C. L., Kubit J. G., et al (2012). "Hospital-based shootings in the United States: 2000 to 2011". *Ann Emerg Med*. 60: 790-798.

Kelly, R. (2012). *Active Shooter: Recommendations and analysis for risk mitigation*. New York Police Department Counterterrorism Bureau. Retrieved from http://www.nypdshield.org/public/SiteFiles/documents/ActiveShooter.pdf.

Kirkpatrick, D. (2014). *Kirkpatrick's four level evaluation model for training success*. Retrieved from http://www.explorance.com/blog/2013/12/kirkpatricks-four-level-evaluation-model-training-program-success/.

Kodellas, S., Fisher, B. S. and Gill, M. (2011). "Violence in the Workplace". In: Clifton D. Bryant, (ed.) *The Handbook of Deviant Behavior*. New York. Routledge.

Kvale, S., Brinkmann, S., Anderssen, T., and Rygge, J. (2015). *Det kvalitative forskningsintervju* (3rd edition). Oslo. Gyldendal Akademisk.

Lazarus, R. S. (1990). "Constructs of the mind in adaption". In: Stein, N.L., Leventhal, B.,

Los Angeles County Sheriff's Department, *Active shooter. School Safety Considerations*, presentation, http://www.worldeducationalmedia.com/ActiveShooterSafetyConsiderations.pdf

Marshall, S. W., Loomis, D. P. and Gurka, K. K. (2003). "Preventing Workplace Violence Through Environmental and Administrative Controls". In: Wilkinson, C. and Peekasa, C. (eds.) *Clinics in Occupational and Environmental Medicine,* Volume 3, Philadelphia. Elsevier: 751-762.

Meredith, C. (2013). "Radical Muslim Arrested over Murder Attempt on French Soldier in 'Woolwich Copycat Attack'". *Express*. Accessed July 16, 2013, from http://www.express.co.uk/news/world/403408/Radical-Muslim-arrested-over-murder-attempt-on-French-soldier-in-Woolwich-copycat-attack.

Mertens, D. (2010). *Research and evaluation in education and psychology; Integrating diversity with quantitative, qualitative, and mixed methods*. Thousand Oaks, California. Sage.

Mueller, J. (2004). "A false sense of insecurity?" *Regulation*. 27 (3), 42-46.

National Institute for Occupational Safety and Health (NIOSH) (1996). *Violence in the Workplace: Risk Factors and Prevention Strategies*. Publication Number 96-100. http://www.cdc.gov/niosh/docs/96-100/.

Norwegian Official Reports (NOU) 2000: 24. *Et sårbart samfunn. Utfordringer for sikkerhets- og beredskapsarbeidet i samfunnet.* Oslo: Ministry of Justice and Public Security.

Norris W. A., Wollert T. N. *Stress and Decision Making*. Federal Law Enforcement Training Center. https://www.fletc.gov/sites/default/files/imported_files/reference/research-papers/Stress-and-Decision-Making-04-06-12-Approved-Public-Release-508-Accessible.pdf.

Perry, R. W. (2004). "Disaster exercise outcomes for professional emergency personnel and citizen volunteers", *Journal of Contingencies and Crisis Management* 12 (2): 64-75

Perry, R. W. and Lindell, M. (2003a). "Preparedness for emergency response. Guidelines for the emergency planning process", *Disasters* 27 (4): 336 – 350.

Perry, R. W. and Lindell, M. (2003b). "Understanding citizen response to disasters with implications for terrorism", *Journal of Contingencies and Crisis Management* 11 (2): 49-60.

Pettersen, K. and Bjørnskau, T. (2015). "Organizational contradictions between safety and security. Perceived challenges and ways of integrating critical infrastructure protection in civil aviation", *Safety Science*, 71, 167-177.

Pidgeon, N. (1995). "Risk perception research: implications for risk regulation and management". In: *Collected Papers of the Conference Understanding Risk Perception* – a special one-day conference on the role of risk perception in safety management in the workplace. Aberdeen, UK, 2 February.

Quarantelli, E. L. (1998). *Major criteria for judging disaster planning and managing and their applicability in developing societies.* Newark, Delaware: University of Delaware District Research Center.

Quarantelli, E. L. (1999). *The sociology of panic*. Preliminary paper 283. Newark, Delaware: University of Delaware Disaster Research Center.

Renn, O. (1991), “Risk communication and the social amplification of risk”, in R.E. Kasperson and P.J. Stallen (eds), *Communicating Risk to the Public*, Kluwer, Dordrecht, The Netherlands: 287-324.

Renn, O. (2008), *Risk governance. Coping with uncertainty in a complex world*, Earthscan, New York.

Ringdal, K. (2013), *Enhet og mangfold. Samfunnsvitenskapelig forskning og kvantitativ metode*. Fagbokforlaget, Bergen.

Rundmo, T. (2000). “Safety climate, attitudes and risk perception in Norsk Hydro”, *Safety Science* 34: 47-59.

Rundmo, T. (1997). “Associations between risk perception and safety”. *Safety Science* 24: 197-209.

Runyan, C. W., Schulman, M. and Hoffman, C. D. (2003). “Understanding and Preventing Violence against Adolescent Workers: What Is Known and What Is Missing?”, in Wilkinson, C. and Peek-Asa, C. (eds) *Clinics in Occupational and Environmental Medicine*, Volume 3, Philadelphia. Elsevier: 711-720.

Sjøberg, L. (1993). “Oro och riskuppfatning”. (Worry and risk perception). Paper presented at FRN/Risk-kollegiets Symposium 17th September 1993, Wennergren-Center, Stockholm (in Swedish).

Sjøberg, L. and Biel, A. (1983). “Mood and belief-value correlations”. *Acta Psychologica* 53: 253-270.

Skog, O (2004). *Å forklare sosiale fenomener: En regresjonsbasert tilnærming* (2nd edition). Oslo: Gyldendal Akademisk.

Slovic, P. (1992), “Perception of risk: reflections on the psychometric paradigm”, in S. Krimsky and D. Golding (eds), *Social theories of risk*, Praeger, Westport, CT, 117-152.

Smith, D. (2004). “For whom the bell tolls. Imagining accidents and the development of crisis simulation in organizations”, *Simulation & Gaming* (35): 347-362

Snyder, L. A., Chen, P., Grubb, P., Roberts, R., Sauter, S. and Swanson, N. (2004). “Workplace Aggression and Violence against Individuals and Organizations: Causes, Consequences, and Interventions”. In: Perrewe, P.L. and Ganster, D.C. (eds.) *Research in*

Occupational Stress and Well Being: Exploring Interpersonal Dynamics, Volume 4, St. Louis, MO. Elsevier: 1-65.

Trabasso, T. (eds), *Psychological and Biological Approaches to Emotion*. Hillsdale, NJ. Erlbaum: 3-20.

Trochim, W. M. K. (2006). *Research methods: knowledge base*. Retrieved from http://www.socialresearchmethods.net/kb/statdesc.php

Trump, K. S. (2009). "Columbine's 10th anniversary finds lessons learned". *Journal of District Administration*, 45 (4): 26-30. Retrieved from http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=4&sid=de0ddedd-5440-4493-9f45-88927c41bc52%40sessionmgr115&hid=128.

Tuttle, H. (2015). *Risk Management*, New York, vol 62, ISS. 9: 4-7.

US Department of Homeland Security *Active shooter. Pocket card information, https://www.dhs.gov/sites/default/files/publications/active_shooter_pocket_card_508.pdf*

US Department of Health and Human Services (2004). *Incorporating Active Shooter Planning into Health Care Facility Emergency Operations Plans*. http://www.phe.gov/preparedness/planning/Documents/active-shooter-planning-eop2014.pdf. Accessed August 1, 2016.

US Department of Justice, FBI. *A study of active shooter incidents in the United States between 2000 and 2013*. https://www.fbi.gov/file-repository/active-shooter-study-2000-2013-1-1.pdf/view.

Wexler, B. and Flamm, A. (2017). "Lessons learned from an active shooter full-scale functional exercise in a newly constructed emergency department", *Disaster Medicine and Public Health Preparedness*, vol. 11/no 5: 522-525.

Wynne, R., Clarkin, N., Cox, T. and Griffiths, A. (1997). *Guidance on the Prevention of Violence at Work*. Luxemburg. European Commission, DG-V

Zajonc, R. B. (1980). "Feeling and thinking. Preferences need no inferences". *American Psychologist* 35 (2) 151-175.

Zhen-Yu, L., Tang, M., Liang, D. and Zhao, Z. (2016), "|Numerical simulation of evacuation in a subway station", *Procedia Engineering*, 135, 616-621.

Østbye, P., Helland, K., Knapskog, K., Larsen, L. and Moe, H. (2013), *Metodebok for mediefag*. Fagbokforlaget, Bergen.

Appendix

Starting questions for semi-structured interview with Equinor stakeholders

The following was made available to the interviewees before I met them.

I am a master student in societal safety and security at the University of Stavanger. I am writing a master thesis for Equinor, with the title "Evaluation of alarm and evacuation procedures for security incidents. A case study of Equinor's Norwegian offices". The research question to be addressed by the thesis is as follows: how much information and what level of skills relating to security threats and evacuation procedures do different groups and ranks of Equinor employees need to acquire?

1) What types of personnel are designated for handling evacuations?
2) What training and information about potential security threats are required for such personnel?
3) What training and information about potential security threats are required for other personnel?
4) Could a high level of evacuation drills spread an unwarranted sense of fear in the organisation, by employees inferring a risk level from evacuation programmes and information campaigns which is considerably higher than the true figure?
5) What is the potential downside of such type of fear?
6) How should Equinor handle the trade-off between having personnel ready and able to evacuate and at the same time not spread unnecessary fear?
    a. How often should drills on *run, hide, fight* take place?
    b. Should e-learning complement or replace drills?
7) To what extent should training and information take into account that it also prepares them for a higher potential for security incidents when employees visit or work at offices Equinor abroad or when at private holidays abroad?