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MASTEROPPGAVE

Offshore terror preparedness in the Barents Sea

"Preparing for the unexpected"

EN310E: Master of Sciences in Energy Management

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Preface

This master thesis represents the final semester of a two-year Master of Science degree within the Energy Management program at Bodø Graduate School of Business and MGIMO University in Moscow. We have faced many challenges along the way in this study. This is mainly due to the limited information shared about terrorism, both from public and private actors. We have gathered highly important, interesting and informative material from our interviews with representatives from the petroleum industry and already published data. Throughout the study we have been confirmed by several participants the importance of this study for the petroleum industry's security.

First of all we want to give a sincere thanks to our supervisor, Odd Jarl Borch, for constructive criticism and guidelines along the way. He has been an incredibly important resource for us in terms of relevant literature, areas to focus on, interesting discussions and topics and especially to obtain interview candidates.

Finally we will gratitude all the interview participants for their willingness to participate in this study sharing their knowledge and experience within the topic studied. Their input and information has been essential and highly necessary for the ability to conduct this research.

Bodø, 20th May 2014

Karin Dahl & Marte Haugan

Keywords: **Preparedness team, Preparedness system, Terrorism, Barents Sea, Managerial roles, Security**

Summary

The petroleum industry is constantly moving further north on the NCS, where oil and gas operators are facing new challenges in more complex environments. The ability to respond quickly in crisis situations is important both economically and socially. Oil platforms are a central and important part of the Norwegian infrastructure, where activities both onshore and offshore represent a large part of the Norwegian economy and are sensitive targets and legitimate goals for terrorist and violent extremists. New terror attacks and regulations in the past years have created national and regional discussions, which calls for oil companies to strengthen their preparedness system dealing with terrorist threats. This has created new demands of upgrading and improving the preparedness system and security strategies.

This paper examines what measures to be done by the national preparedness system and the oil companies and their 2nd line preparedness teams to strengthen their preparedness and security against terror threats in the Barents Sea. Our research question is as following:

> *"How should the managerial roles within the 2nd line preparedness team be strengthened to handle terror threats in the Barents Sea?"*

Companies in the petroleum industry faces challenges related to security and preparedness of offshore installations in the Barents Sea such as: lack of resources, long respond time, long distances, harsh weather conditions, communication and cooperation difficulties between a highly number of participants, lack of full-scale practices and lack of knowledge and experience handling terror threat situations. One way of meeting these challenges is to strengthen the 2nd line preparedness team within the oil companies. The preparedness team consists of several managerial roles that are responsible of assisting the 1st line preparedness team located on the platform. The managerial roles within the 2nd line are responsible of the following areas during a crisis situation: handling the media, contacting the authority, protecting the environment, contact with the rig team, logistic and resources assistant and allocation, ensuring personnel care and an action manager managing the whole preparedness team. It is limited what changes that can be done within the 2nd line preparedness team to strengthen the preparedness against terror attacks in the Barents Sea without strengthening the oil companies preparedness system and the national preparedness system. It is therefore needed to examine what changes that can be done within these two preparedness systems to

strengthen the performance of the 2nd line preparedness during a terror threat situation in the Barents Sea.

The main findings in study show that the 2nd preparedness team should establish two new managerial roles: 1) Expertise of handling terror threat situation and 2) Local and regional expertise handling crisis situations in the Barents Sea. Due to the complex environment and the high number of preparedness participants full-scale exercises should be held in the Barents Sea region more frequently practicing on different terror attack scenarios. A clear and common terror threat picture between the oil companies and the authorities needs to be in place to implement necessary measures such as: physical security of installations, increased regional resources and improved infrastructure to prevent and prepare for terror attacks in the Barents Sea.

Sammendrag

Petroleumsnæringen beveger seg stadig lengre nord på den norske sokkelen, noe som fører til at olje og gass selskapene står ovenfor stadig nye utfordringer i mer komplekse omgivelser. Evnen til å reagere raskt under krisesituasjoner er nødvendig både på grunn av økonomiske og sosiale grunner. Oljeindustrien i Norge representerer en sentral del av den norske verdiskapningen hvor offshore oljeinstallasjoner vil være potensielle terror mål for terrorister og voldelige ekstremister. Tidligere terror angrep har skapt nasjonale og regionale diskusjoner, og det er et behov fra oljeselskapene sin side å styrke sitt beredskapssystem for å håndtere terror trusler. Dette har ført til nye krav om oppgradering og forbedring av beredskapssystemet og sikkerhetsstrategier.

Denne oppgaven undersøker hvilke tiltak som må gjøres innen det nasjonale beredskapssystemet og av oljeselskapene for å styrke beredskapen og sikkerhet av olje installasjoner mot terrortrusler i Barentshavet.

Vår problemstilling er som følgende:

> *"Hvordan skal lederrollene i andrelinje beredskapen styrkes for å kunne håndtere terror trusler i Barentshavet?"*

Petroleumsindustrien står ovenfor utfordringer knyttet til sikring og beredskap på oljeinstallasjoner offshore hvor det er en mangel på ressurser, lang respons tid, store avstander, vanskelige vær forhold, samarbeid og kommunikasjonsvanskeligheter mellom mange beredskapsaktører, mangel på fullskala øvelser og kunnskap og erfaring med å håndtere terror situasjoner. En måte å møte disse utfordringene på er å styrke oljeselskapenes andrelinje beredskapsteam. Andrelinje beredskapsteamet består av flere lederroller som er ansvarlig med å bistå førstelinje beredskapsteam på olje plattformene. Lederrollene innen andrelinje teamet er ansvarlige for følgende områder under en krisesituasjon: media håndtering, kontakt med myndighetene, beskytte miljøet, kontaktpunkt med ulykkesstedet, fordele og skaffe nødvendige ressurser, sikre personell og i tillegg hvor det er en overordnede som har ansvar for å lede beredskapsteamet. Det er begrenset hvilke endringer som kan gjøres i andrelinje for å styrke beredskapen rettet mot terrorangrep i Barentshavet uten å se på hvordan oljeselskapenes beredskapssystem og det nasjonale beredskapssystemet kan styrkes.

Det er derfor nødvendig å undersøke hvilke endringer som kan gjøres innen disse områdene for å styrke kapasiteten til andrelinje beredskap under en terrorsituasjon i Barentshavet.

De viktigste funnene i denne oppgaven er at andrelinje beredskap bør etablere to nye lederroller. Den først med kompetanse til å håndtere terrortrussel og den andre med lokal og regional kompetanse for å håndtere krisesituasjoner i Barentshavet. Barentshavet befinner seg i et kompleks miljø hvor terror beredskapssituasjoner krever deltakelse fra et høyt antall aktører. Det bør derfor holdes flere ”fullskala øvelser” i Barentshavet der alle aktørene som deltar under en terror krisesituasjon er med. Det er også behov for å etablere en sterkere felles forståelse av terrortrussel bildet i Barentshavet mellom oljeselskapene og myndighetene. Et samlet trusselbildet vil gjøre forbedringsprosessen av beredskapssystemet lettere hvor man ser de samme behovene for fysisk sikring av installasjoner, økt ressurs behov og forbedring av infrastrukturen i Barentshavet for å håndtere terror angrep.

Terms and definitions

Adverse events can be used as a generic term for all types of accidents, crisis disasters etc. These are events that derivate from the normal, and there are actions to prevent and limit the damage of an adverse event (Sommer, 2013).

Crisis is an event that has the potential to threat important values and weaken an organizations ability to perform their essential functions (NOU, 2000:24).

A crisis could develop into a **disaster,** which is an event with serious injuries and losses (NOU, 2000:24).

Intentional adverse event is a type of adverse event that people do intentionally, examples here are terrorism, organized crime and security threat activities (Sommer, 2013).

Preparedness is measures to prevent, restrict or handle crisis or other adverse events (NOU, 2000:24). Preparedness is planning of measures to handle adverse events as good as possible after they have happened (NOU, 2006:6).

Prevention is actions to reduce the probability of adverse events appearing and the consequences of the event if it happens (NOU, 2006:6).

Risk is a function of the likelihood of potential adverse events and their consequences. Risk expresses' the risk of loss of values such as life, health, environment, economy and social services (NOU, 2000:24).

Terrorism is often used as a general characteristic of several informs of adverse events. In this study terrorism is defined as "Actions aimed at physical objects or people where participants have a clear political objective to modify a given political condition through the use of violence". Other characteristics include hidden planning operations, strict secrecy of participant's identity, strong political or religious motivation and the use of fear as a political weapon (Johanesen, 1994).

Threat is any event with the potential of causing an adverse event, this doesn't include the will and probability of the event occurring (NOU, 2000:24).

Vulnerability is the problem the systems, such as a state, company or a single computer system, will have to function when they are exposed to an adverse event, as well as the

problems the system will face to resume its activities after the event has occurred (NOU, 2000:24).

Safety is used to describe security from adverse events as a result of causal events. (NOU, 2006:6).

Security is used to describe security from adverse events as a result of intentional events (NOU, 2006:6).

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Abbreviations

CMP – Crisis Management Plan

HSE – Health, safety and environment

JRCC – Joint rescue coordination centre

NCS – Norwegian Continental Shelf

NIS - Norwegian intelligence service

NPA – Norwegian Petroleum Directory

OED – The ministry of petroleum and energy

OIM – Offshore Installation Manager

PSA – Petroleum Safety Association (PTIL)

PST – Norwegian police security service

SAR – Search and rescue

UNCLOS – United Nations convention on the law of the sea

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1.0 Introduction

In this chapter we give a brief introduction to the thesis and what we want to examine. First the background behind our topic is given. Thereafter we give a presentation of the problem description and the research question. In the end we shortly present the limitations and the structure of the thesis.

1.1 Background

Norway has traditionally been considered a low risk country related to terrorism. Temporary globalization and the growth of terrorism groups such as Al-Qaida –networks have been contributors changing this picture. Globalization has created stronger and closer ripple effects from distant conflicts affecting other nations, such as Norway. The terrorists have become more globalized through the use of Internet and other technologies, making the communication, gathering of partners, collaboration and information collection an easier and more efficient process. This also gives potential opportunities to operate alone as a terrorist. The terrorist attack on Utøya in Norway on the 22nd of July 2011, is a dramatic example of the potential of organizing and operating terrorist attacks alone (Australian Government, 2012). The terror attack on the 22nd of July shows that Norway is not only vulnerable against international terrorism attacks, but also national terrorism performed by Norwegian citizens themselves (Kjøk, 2014). The terrorism risk in Norway is still low, but people have become more aware of the threat of terrorism and that it can happen in Norway (Kjøk, 2014).

The Norwegian petroleum industry has experienced the threat of terrorism on close hold during the In Amenas attack in 2013 on a gas installation in Algeria. Statoil especially and other oil companies operating on the NCS, have strengthen their security of information, personnel and facilities within the Norwegian petroleum industry. Terrorist groups have shown interest in economical targets, where oil and gas installations on the NCS represent a large amount of economical importance nationally and internationally (Australian Government, 2012). Norway's openness and valuable petroleum installations makes them vulnerable terror targets (Berglund, 2014).

Petroleum companies are constantly moving further north on the NCS. The Arctic areas are believed to hold huge reserves of oil and gas about 22% of the worlds remaining undiscovered petroleum resources (Arctic, 2014). For decades the cost level of operating in

the Arctic area has been high. This situation is changing due to high oil prices and increased competition for new petroleum resources as a consequence of the increased demand (Hasle, 2008). A series of new petroleum field centres are in the making in the Norwegian Arctic waters, located in the Norwegian Barents Sea. The Norwegian Government states the development in the Barents Sea will strengthen the long-term foundation of the Norwegian wealth creation (Norwegian Ministry of Foreign Affairs, 2011). The oil and gas companies operating in the Barents Sea also face new challenges due to its complex and harsh environment with long distances between shore and the petroleum fields, lack of infrastructure and sensitive ecosystem (DNV, 2012).

The petroleum companies need to build adapted preparedness systems that meets the challenges within the Barents Sea region (Borch, 2013). It is required from the Norwegian government that petroleum companies prevent and handle major risks in the Arctic as environmental-, hazard- and crisis risks. The industry needs to develop robust techniques and solutions to maintain a high-functional preparedness system. Due to lack of infrastructure and long distances operators and actors need to cooperate and share resources, knowledge and competence on a much higher level that further south on the NCS (Petroleumtilsynet, 2013).

Oil and gas installations on the NCS today are not designed to withstand security attacks such as terrorism (Johanesen, 1994). Greenpeace has several times demonstrated how easy it is to enter oil and gas installations (Lewis, 2013a).

This discussion above shows that the preparedness system offshore in the Barents Sea needs to be strengthened and adapted to the challenges within the Barents Sea and terrorism. Terrorist attacks in Norway and globally has made us realize that Norwegian oil platforms might be potential terror threat goals. This has increased the focus on preparedness and security against terrorism in the petroleum industry (Petroleumtilsynet, 2014b).

1.2 Problem description and research question

In this study we examine how the 2nd line preparedness team and their managerial roles can strengthens to be prepared for terror threats in the Barents Sea. The research question is as following:

> ***"How should the managerial roles within the 2nd line preparedness team be strengthened to handle terror threats in the Barents Sea?***

1. Firstly we examine how the 2nd line preparedness team can be improved and strengthen to meet different types of terror threats in the Barents Sea. Thereafter we examine what measures the oil companies' needs to implement to strengthen their 2nd line preparedness team to perform their managerial roles.

   "How can the managerial roles within the 2nd preparedness team be strengthened to prepare for terror attacks in the Barents Sea?"

2. Secondly we examine how the national preparedness systems prepare for terror threats in the Barents Sea. We examine how the governmental framework and regulations are set for the 2nd line preparedness team to handle terror threats in the Barents Sea. Also the cooperation between the oil companies, authorities, ministries and the public preparedness actors are being examined.

   "What measures should the national preparedness system implement to strengthen the 2nd line preparedness teams ability to prepare for terror threats in the Barents Sea?"

3. Thirdly we examine what challenges the preparedness team meet in the Barents Sea when preparing for terror attacks. We examine what is required of knowledge and competence within the preparedness team to meet these challenges. There will also be a comparison of what resources that are needed within the Barents Sea to reach the same preparedness level as the rest of the NCS.

   "What are the main preparedness challenges in the Barents Sea that needs to be solved for the 2nd line preparedness team to handle terror threats?"

4. Finally we examine how the 2nd line preparedness team should prepare for different types of terrorists and terror attacks. We also examine what risk assessments are done to evaluate the trends and developments in the terror threat picture. Last we examine what knowledge and experience the 2nd preparedness team should have to understand the terror risks facing the petroleum installations.

"What measures should the oil companies and their 2nd line preparedness team implement to prepare for terror threats in the Barents Sea?"

Bellow is a figure illustrating the research problems mention above, divided into four variables influencing the 2nd line preparedness team:

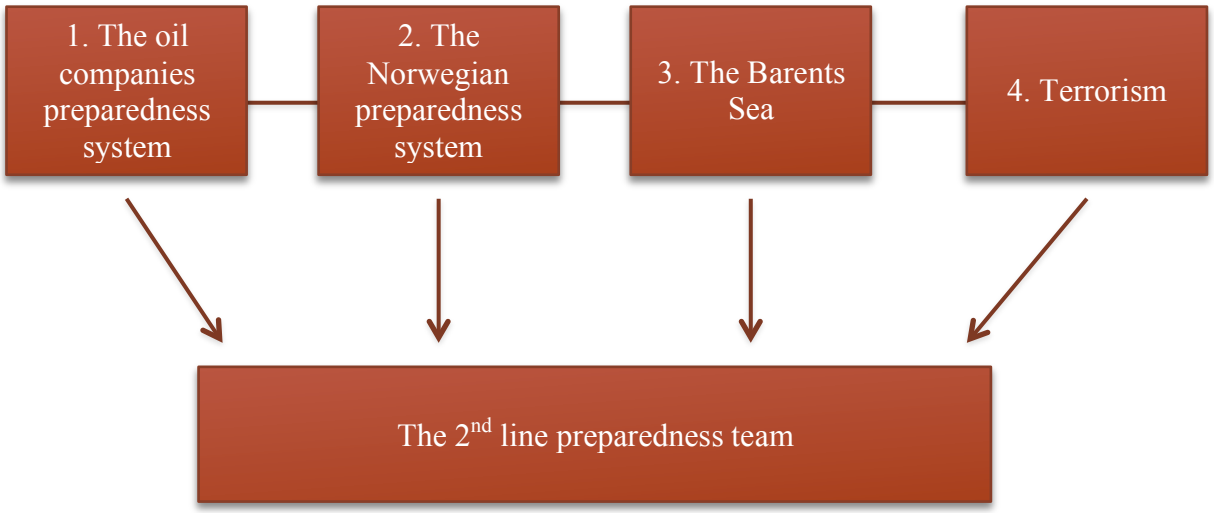

Figure 1 - A visual illustration of the research problem

We see that the four variables affecting the 2nd line preparedness team also have a correlation them in between. Meaning that it will not be possible for us to examine these four variables independent from each other. Even though these variables are not fully independent from each other we have still structured the thesis into four individual parts to create a better overview and understanding of what we examine. In the analysis and conclusion parts we will implement these four variables more to give a better understanding of the preparedness system.

The 2nd preparedness line team plays an important role during a crisis situation assisting the platforms with resources, information and instructions. Due to their large responsibility it would be interesting too examine how these roles could be strengthen to handle terror threat

situations in a turbulent and extreme environment, such as the Barents Sea. The performance of these roles is dependent on how the petroleum companies structure rest of their preparedness system and how the national preparedness system is structured and facilitate for the 2nd line preparedness to handle terror threats in the Barents Sea.

1.3 Limitations

There are some limitations to this study that should be mentioned.

The preparedness system is a complex system with many factors influencing how the oil companies are able to prepare for different hazards and accidents. An important element that gives limitations for this research is the choice of a theoretical framework, which gives greater emphasis on certain aspects. Crisis management consists of several processes including before, during and after a crisis situation. This includes everything from preparedness, mitigation of effect, recovery and return to normal life (Duyan, 2012). This study only focuses on the preparedness phase, which is how the company and other actors prepare themselves for a crisis situation.

Crisis situation can occur for many reasons and we have in this study chosen to focus on the crisis situations as a result of extreme forms for terrorism including the discussing of environmental activists offshore. Focusing only on the threat of terrorism has narrowed our study to only examine how the preparedness management system function related to security, and not safety covering threats such as fire, oil spills etc. Terrorists can attack different parts of the petroleum industry, such as onshore plants, refineries, offices and buildings in several locations on the NCS both onshore and offshore. We have chosen to limit this study to potential terror attacks of offshore installations in the Barents Sea.

In the empirical data collection we have chosen to focus on two major petroleum companies ENI Norge AS and Statoil AS. This is mainly due to their present or future present in the Barents Sea, representing the oil and gas installations Snøhvit, Goliat and Johan Castberg. In addition we have examine the function of external preparedness actors such as ACONA AS, delivering preparedness services to ENI Norge AS. From the governmental part of the preparedness system we have mainly focused on the role of the Norwegian Police and PSA. There would have been relevant to study other oil companies on the NCS, other preparedness

participants during a crisis situation, and authority bodies, but due to limited time and other actors have been excluded.

1.4 Thesis structure

The thesis consist of six chapters:

Figure 2 - Structure of the thesis

The introduction chapter given an overview of the problem statement and research question we study in this thesis. In the introduction chapter we also argue why this topic is relevant, and the limitation of the study.

Theory is covered in chapter 2, where the main focus is on managerial roles and preparedness theory, organizational culture and theory related to terror and complex environments.

The methodology of the research is presented in chapter 3. The aim of this chapter is to explain and argue for how the research has been conducted methodologically. We explain which methods used to gather empirical data and why these approaches are chosen.

The empirical data is gathered in chapter 4, presenting the secondary and primary data together. The secondary data is mainly from articles, academic books, Internet and reports, while the primary data is gathered through 10 in-depth interviews.

The analysis is represented in chapter 5, linking the theory and empirical data. The chapter is divided into four parts, which present each of the four independent variables that affect the 2nd line preparedness team and its managerial roles.

The final conclusion is presented in chapter 6, with further study recommendations.

2.0 Theory

This chapter sets the theoretical framework for our research, determines what variables that are measured and what statistical relationships that are examined. The theoretical framework gives an overview of the theories used in the research and form the basic for the empirical study and the analysis of the results. In this research the theory will help to explain what managerial roles that are needed within the preparedness team to face new threats in more complex and turbulent environment related to terror attacks on oil and gas installation.

We focus on some theoretical approaches to try to describe and explore how the different independent variables influences the managerial roles in the 2nd line preparedness teams ability to meet terror threats in the Barents Sea. We have divided the theories into sub chapter, where each theory is related to an independent variable to be able to analyse the empirical data.

As we wanted to examine the managerial roles in the 2nd line preparedness team, we first define what a preparedness team is, their function and the managerial roles within the team. There are many theories related to managerial roles, where we use Mintzberg managerial role theory as a foundation for this research. The theory related to preparedness is generally conducted from the authorities and other public agencies.

The oil company's preparedness team are influenced by many factors and in this study we have focuses on four independent factors that in their own way can influence the managerial roles in the preparedness team. The aim was to find suitable theory related to the relationship between the different independent variables and the managerial roles. The first subchapter present theory related to the oil company's organization culture and how this affect the manager's capacity to handle crisis situations. We also present theory related to exercises, which is a foundation for the managerial roles to be able to handle different types of crisis situation in more turbulent environment including several actors.

The second subchapter present theory related to the preparedness institution and how they affect the managerial roles in the preparedness system. There are different approaches to how the authority and the industry collaborate in terms of preparedness.

The third sub chapter present theory related to an operational context and how this affects the managerial roles in a preparedness system. This chapter defines a complex environment and

what this requires from the 2nd line preparedness team to obtain a high security level. The chapter also gives an introduction to theory about collaboration in turbulent situations in terms of resource allocation.

The last subchapter, terrorism, focus on various forms of terror attacks and terrorists that the preparedness team needs to prepare for. The managerial roles within the team need to understand and be aware of these threats in order to practice and exercise on different terror scenarios. Some theory is related to the terrorist capacity and the potential damage they can cause to oil installations and the organization. Other theories are related to the development in the terror threat picture.

2.1 Preparedness team

A preparedness organization is responsible of individual jurisdictions. These organizations consist of preparedness teams that are responsible of coordinating preparedness activities among those actors within the organization, other public and private actors (Blanchard, 2007). The preparedness teams shall reduce the consequences of a terror attack and protect the people, and the oil and gas installations in a crisis situation (University of Oslo, 2014). The main goal of a preparedness team is primarily saving lives, protect the environment and ensure values (NOU, 2000:24).

"The preparedness teams within the preparedness organization are those who are planed, established, trained and exercised to handle crisis situations" (NORSOK STANDARD Z-013N, 2001)

There are three main preparedness teams, where the 1st line preparedness team includes personnel on the rigs and installations, while the 2nd and 3rd teams represent those preparedness teams onshore. In general the preparedness teams represent all personnel used in a crisis situation (NORSOK STANDARD Z-013N, 2001). Preparedness is defined as "*the planning and preparation of measures to limit or handle crisis or other situations in the best possible way"* (NOU, 2000:24, NOU, 2006:6). A team is defined as *"a group of people with different skills and different tasks, who work together on a common project, service, or goal, with a meshing of functions and mutual support"* (University of Washington, 2010 p.1). The preparedness teams create strategies and plan to protect the organization against accidents and crisis situations. Crises will occur despite of these preventions and it is therefore important that the preparedness teams train and practice how to handle crisis situations (NOU, 2006:6).

2.1.1 Introduction

The preparedness team consist of several members, where each member has their own managerial role, and are responsible to give orders and instructions to other personnel within other teams, the organization and other actors. There are decisions taking individually by each team member and collaborative decisions between the members.

Preparedness management is about making a group of people conducting certain tasks in a dynamic and complex situation that are constantly changing. A preparedness manager coordinates the preparedness teams resources and ensures that tasks are preformed in an

effective way reducing harms (Sommer, 2013). The preparedness manager is highly dependent on other members of the preparedness team to successfully handle the situation (Bråten, 2013).

> *Coming together is a beginning; keeping together is progress; working together is success."* - Henry Ford

The preparedness team must be well structured and consist of personnel with the right skills, where necessary resources should be available for the team to function optimal (University of Washington, 2010). The preparedness team needs to be organized and managed across different actors and departments (Aarset, 2014b). Teams are often structured hierarchical, where the member's tasks are divided into sub-components. A hierarchical structure can be effective, but it challenges a good communication flow within the team (Brun, 2003).

The preparedness team needs to be large enough to handle potential crisis situations and have the knowledge and capacity available to take the right decisions. The size of the team depends on the complexity and extent of the organization it operates within, and if the team becomes too large it can contribute to problems. A team should consist of different skills covering the areas technical, security, law, communication and information. In addition the team needs to take good collaborative decisions under stress (Aarset, 2014a).

The offshore industry has long tradition with teamwork where many of their operations require personnel teamwork. For the preparedness management team to be prepared there are certain requirements for the different roles. The members of the team must be able to listen and give constructive feedback, to avoid communication problems. The members of the team have to have a clear understanding of their own role, but also understand the other members roles if something goes wrong (Flin, 1997).

2.1.2 Managerial roles

Each member of a preparedness team has their own responsibility area where they function as a manager. Mintzberg defines a manager as a person that are responsible for the activities, tactic and training of a team (Mintzberg, 1973). Being prepared for emergencies is about good management where each member of the team needs to organize and have control of the whole situation. The manager needs to have the right competence and capability to coordinate all the actors involved in a preparedness situation (Bråten, 2013).

There is a handful of research on what managers *should do*, rather than what managers *actually do*. Many would say that managing is about planning, organizing, coordinating and controlling, but Mintzberg disagree stating that this is not what happens in real situations (Mintzberg, 1989). Henry Mintzberg states that there are ten primary roles or behaviours that can be used to categorize a managers different functions as shown in the model bellow: (Mintzberg, 1989)

Interpersonal	• **Figurehead** • **Leader** • **Liaison**
Informational	• Monitor • Disseminator • Spokesperson
Decisional	• Entrepreneur • Disturbance handler • Resource allocator • Negotiator

Figure 3 - The manager's role (Mintzberg, 1973 pp.92-93)

The manger has three interpersonal roles, which arises directly from authority. The first one is that a manager is a figurehead in the organization where they perform some duties of ceremonial nature. As a leader the manager is responsible for peoples work, hiring and training staff. In addition the manager is also responsible making contacts outside the vertical chain of command (Mintzberg, 1989). Henri Fayol is one of the most influential contributors to the modern concept of management believe that authority and responsibility are requirements for the manager to achieve the organizations goal *(Pryor, 2010)*.

The role of a manager under communication and interaction with external stakeholders is to link them with the organization. Firstly the manager needs to monitor all information and pass it over to the organization. The last part of the information role is to be a spokesperson for the organization and to give advise to the organizations personnel (Mintzberg, 1989).

The information part is not a goal in it self, but rather a necessary tool for the manager to take the right decisions. During the decision making process the manager plays a central role in the organization and where Mintzberg divides the manager's job into four roles. Firstly a manger is an entrepreneur that is responsible for improving the organization and adapt to changes in the environment. One of the entrepreneur's tasks is to choose between different ideas. Secondly a manager function as a disturbance handler and are responsible of responding to pressure from external factors and stakeholders. Thirdly a manager allocates resources deciding what parts of the organization gets what and improves resource decisions. A manager also function as a negotiator which is a integrated part throughout the whole managerial work process (Mintzberg, 1989).

Its difficult to separate these ten roles since they all overlap each other. None of the roles can be removed from the manger process without the process collapsing. Two or three employees are not able to share a leader role unless they are able to act as one unit. This indicates that it is not possible to divide the ten roles unless they are able to re-integrate the roles afterwards. The real problem is linked to the information role. If the information sharing process is not complete throughout the whole organization the teamwork will collapse. Even though most managers fulfil all the ten roles there are also managers not given simultaneous attention to all the roles. This highly depends on the personality and experience of the managers and what organization the manager works for (Mintzberg, 1989).

2.2. Factors influencing preparedness management teams

The modern society sets high demand on the performance of task in form of team work, due to complex assignment that requires extensive knowledge, expertise and experience, the roles has to be divided. All the qualities to solve situations such as an emergency situation, cannot be hold by one individual (Kelfstad, 2011). Many factors and resources influence the different roles in the oil companies' preparedness team. During all the phases of a preparedness situation the members of the team are primarily responsible for the health of safety of they employees in the company (OSHA).

2.2.1 Organizational culture and managerial roles

Organizational culture has an influence on how the preparedness team handle crisis situations. There is usually a difference between what is done during a crisis situation and what was planned to do during a crisis situation. This is highly influenced by the organizational culture, how the members of the preparedness team thinks and their attitudes (Bråten, 2013). Organizational culture is describes as

> "*A pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and therefore to be taught to new members as the correct way to perceive, think, and feel in relation to those problems*" (Schein, 1984 p.1).

Organizational culture could be anything from common behaviour, to new corporate values that the management wish to implement in their organization. Even though we know our organization well, it does not automatically mean we know how it arose, how it has changed over time and what made it change. To answer these questions it is essential to understand the dynamic evolutionary forces contributing to these changes (Schein, 1984).

The organizational culture needs to be spread throughout the whole organization for it to be valid and it needs to be taught to new employees or members (Schein, 1990).

Organizational members bring changes to the organizational culture based on their perceptions, thoughts, and feelings. One way to improve the security level is to change the

organizational culture (NOU, 2000:24). To change the organizational culture, the employees perception, thoughts and feelings about security needs to change (Schein, 1984).

The organizational culture is affected by the organizations ability to test their preparedness plans through preparedness exercises. A condition for conducting preparedness in a purposefully way with a certainty of a great result is exercises between the oil companies, the police and the armed force (Politiet, 2011). Preparedness exercises will be based on the design of crisis situations and accidents that might occur in the oil industry sector. The goal of an exercise is to impose the ability to solve different tasks during a real crisis situation (Bråten, 2013). Its important for the organization to train for different crisis situations and these different types of practice can be divided into three main categories

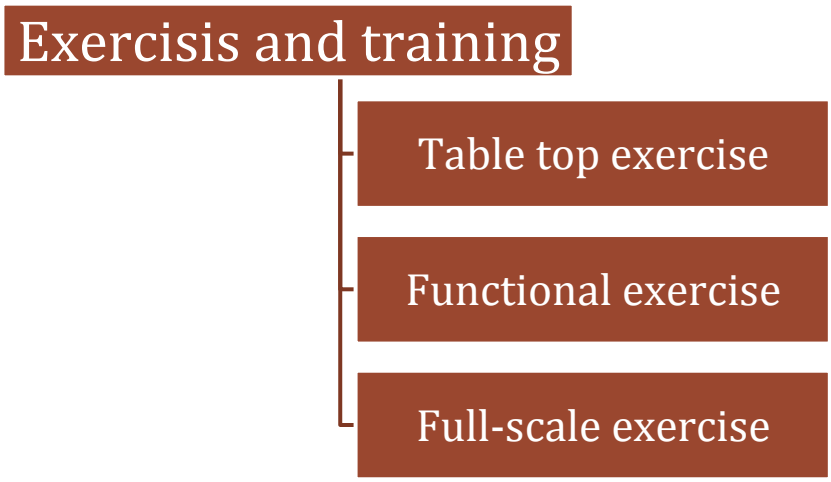

Figure 4 - Preparedness exercises (Bråten, 2013, pp.22-23)

Tabletop exercise normally consist of interactive discussion of a simulated scenario where the participants are distributed with their own case study and must explain how they will solve the crisis situation. The exercise is normally conducted in a conference room and focus on the roles and actions of the individuals, the interaction between the different roles and development of decision-making strategies. The exercise emphasis how people individually thinking and the reasons behind the decisions they take along the way (Bråten, 2013). The tabletop exercise is a very useful training method that only requires a modest commitment in terms of cost, time and resources. The exercise is also a effective way to evaluate plans and procedures with the help from key personnel with emergency responsibility. The disadvantages connected to the exercise is that there is some lack of realism connected to the

exercise, only provides training on some parts of the plans and its difficult to provide a practical way to demonstrate the system (Agency).

Functional exercise focuses on the coordination between several actors at the same time. There are only some part of the emergency plan that is tested in practice, which makes the exercise more realistic then typical tabletop exercises (Bråten, 2013).

Full-scale exercise is as close to a real situation as possible with location, resources and personnel that would be present during a crisis situation. The exercise will be on a larger scale, scope and number of participant then functional exercise. This type of exercise test several elements of the emergency plan and more players are being tested simultaneously. This can be done in two different ways either where the players is prepared or that the situations are totally unprepared (Bråten, 2013)

2.2.2 Preparedness institutions and managerial roles

An effective preparedness management team must ensure clear roles and responsibilities between its members, and there need to be clear roles between the team and other parties collaboration during a preparedness situation. Parties that are usually involved in the preparedness situation are the authorities, the industry and suppliers. In this case the industry represent the oil and gas companies.

The performance-based model gives a clear split of responsibilities, where the authority is responsible of the performance goals and acceptance criteria. The industry is responsible of making sure that the performance goals are met (Tørstad, 2010).

Another approach is the prescriptive model where the authority will determine specific the performance requirements and approve the oil and gas company's preparedness plan. Normally the oil and gas company will be defined in the regulation and how they should carry out liable operations. This approach might cause confusion when something goes wrong. The responsibilities between the parties are not always fixed and might vary between different pieces of the regulation. It would therefore be more convenience using a performance-based model when the authority want to minimize their own risk and liability (Tørstad, 2010).

A crisis situation consists of overlapping work that requires a clear distribution of roles and responsibility. In overlapping work it is important that all participants have knowledge and

understanding of the their own responsibility and tasks, while at the same time know the other participants roles (Bråten, 2013).

In a turbulent and complex environment, facing the threat of terrorism, the different parties need to integrate on a high and complex level to be able to handle these threats. Collaboration has a higher intensity than cooperation and coordination, where all parts contribute, share resources, rewards and leadership to create a structure to meet common goal. Successful collaboration relies on openness and knowledge sharing, but where each partner still needs to have focus and accountability on own organization. It is required that all parts are committed to the shared goals and responsibility. In addition they should develop a jointly structure that are designed to share resources, risks and rewards. When working together it is extremely important that everyone have the same perception of the purpose behind the collaboration, commitment requirements, and expectations of the other partners (Lukas, 2014).

2.2.3 Operational context and managerial roles

The society has gone through enormous changes in the last century and the environment has become more complex, with high interaction and dependency between actors and activities. Complex environments are characterized with rapid and often unpredictable changes (Njå, 1998).

The correlation of different roles represent one of the main challenges within a dynamic and complex situation (Sommer, 2013). It requires a high level of management to keep a clear overview and control of the situation and to delegate tasks and responsibilities. A manager will need to handle a stressful situation under time pressure with several external influence factors (Sjoberg, 2011).

The preparedness team is dependent on resources and skills from a wide range of actors to that needs to be integrated into one process. A highly complex environment requires many participants, the more participant and roles within a system the more challenges it will become to handle the situation. This requires a common framework coordinating all the participants and their responsibility and roles (Hossain, 2012).

Though collaboration the preparedness team are capable of gaining greater resources, recognitions and reward when facing threats (Aiim.org, 2013). Resource collaboration during a crisis situation is necessary and could be anything from personnel, helicopter services,

equipment and communication lines. The allocation of resources between the different actors depends on the situation, what resources that are available and needed. To utilize these resources in the best way are highly dependent on the communication and information sharing between the participants. The resources need to be organized where they are easily available during a crisis situation, with back up resources (Njå, 1998). Sharing resources through communication and information sharing makes it possible for the preparedness team to gain control of the situation (Hossain, 2012).

2.2.4 Types of terrorism and managerial roles

Terrorist attack was put on the map in 1970 when the world experienced the first hijacking ever. The view on terrorism has changed in the recent years due to terrorist attacks such as the 11/9 in the U.S and it is expected to continue increasing (Duyan, 2012). The political and social environment is constantly heating up. One of the main reasons is the increased political role of the government in the economy (Combs, 2013). Technology, human and social environment has become more complex, interrelated, and tightly coupled where people have become more informed and educated, demanding safer and more secure products. Mass media, satellite communication and computer networks have made people join social action groups that often leads to confrontation and in some cases to intentional acts such as terrorism (Lerbinger, 1997). This has affected the structure of the security force where large amounts are used on protection of vital installations and systems (Combs, 2013).

There is no general definition of terrorism, but some limits are important to define. The Security Act defines terrorist actions as: *"Illegal use of, or the threat of use of, force or violence against persons and property, in an attempt to exert pressure on the authorities of a country or the population or society on general in order to achieve political, religious or ideological aims"* (Norwegian Directorate for Civil Protection, 2013 p.145)

With today's challenges there is a need for an effective preparedness management team. "*To develop a high level of preparedness, we must have sufficient knowledge of the dangers that may threaten the community and population. It is almost impossible to define goals and what dangers we are exposed to at all times"* (NOU, 2000:24 p.17) The preparedness system is a combination of different operations and personnel requiring a dynamic structure to adapt to and handle new situation where the risks are changing (Nilsen, 2010).

In the latest year there has been several terrorist attack increasing the terror risk and making us more aware of new threats in terms of terrorism. These events requires that preparedness teams are prepared for similar events in the future, but also other types of terrorist attacks that still has not occurred.

Terrorism is political, economical and social motivated, where attacks are performed in various ways with different methods, intentions and goals (Bråten 2013). A terror attack can be seen as a strategy, where violence is used to engender fear among political ends, where terrorists believe that justice and political goals can be achieved through violence and fear (O'Kane 2012).

The key elements of a military decision-making process is that the *process consists of four clearly identifiable elements that make up a continuous mental process: observation, evaluation, decision and action. Ability to conduct this process faster than your opponent is crucial for success in future conflicts (Arsham, 1994).* The manager as a decisions maker needs to have full information of the situation and take a decision and act upon that. To take this decision the manger needs to know all possible alternatives, the consequences of each alternative, be prepared for these consequences and compare the consequences and to determine which one to choose (Turpin, 2004).

The ability to handle a terrorist attack depends on the response time from the preparedness team. Response time is the time from the attack happens, until the forces are inserted. The respond time will depend on the distance to the accident site, the time it takes for the preparedness actors to be ready and how quickly they get notice from the oil companies. The respond time will also be affected by the people in charges ability to make quick decision and forces that are available in a short time (Ulriksen, 2013).

The respond quality depends on the capacity to gather the right resources to handle the situation. This requires that the decision maker understand which resources the different attacks require in different environments, which is dependent on local knowledge (Ulriksen, 2013).

The UN defines a terrorist as *"a person illegally and intentionally takes action causing death or serious injury, or serious damage to public or private property (including public areas, government building, public transport and infrastructure"* (UN, 2013). It is important that the preparedness team understands patterns of behaviour and evaluates forthcoming patterns of

different terrorists (Combs, 2013). During a terrorist attack the decision maker need to have an overview of the different potential terrorist and which potential damage they can cause the organization.

There are suggested that different terrorists can be divided into three categories. In the last decade the majority of individuals and groups carrying out terrorist acts have been crusaders. *Crusaders* act upon reasons that are often unclear to themselves and others. Their goals are often less understandable, idealistically inspired with a mix of different philosophies. They seek not personal gain, prestige and power, thinking they serve a higher cause. They are professional, well trained and disciplined, where death is seen as a reward since death is seen as a reward rather a penalty and negotiation is minimal (Combs 2013).

Craziest are emotional distributed individual, driven to commit terrorist attacks based on own reasons that are not clear to anyone else. If the negotiators are able to understand the motivation and goal of the craziest, it would be possible to negotiate with the terrorist (Combs 2013).

Criminals are individuals performing terrorist acts for more easily understood reasons. They are fully responsible and aware of own actions, and their motives and goal are clear. Criminals are moistly willing to negotiate, with specific and logic demand that are possible to be met by rational alternatives. They have a desire to survive (Combs 2013).

Type of Terrorist	Motive/Goal	Willing to Negotiate?	Expectation of Survival
Crusader	"Higher cause" (usually a blend of religious and political)	Seldom, since to do so could be seen as a betrayal of the cause	Minimal, since death offers reward in "afterlife"
Criminal	Personal gain/profit	Usually, in return for profit and/or safe passage	Strong
Crazy	Clear only to perpetrator	Possible, but only if negotiator can understand	Strong, but not based on reality

Figure 5 - Different types of terrorist (Combs, 2013 p.54)

The terror attack on an oil platform can take place in different ways requiring that the preparedness team have an overview of different terror attacks scenarios. (Johansen, 1994) suggest that the scenarios can be based on the actor's capacity and intention, where those actors with the highest capacity and intentions equals the highest threat.

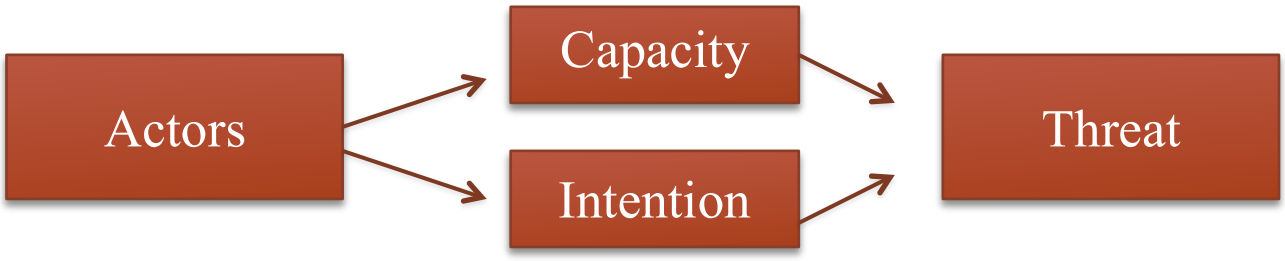

Figure 6 - Definition of threat (Johansen, 1994 p.21)

To be able to set scenarios and understand the terror threat picture the preparedness team should be aware of the triggers and trends in the world society that will have an impact on the terror threat picture. These factors are constantly changing and the preparedness team needs to be updated on these changes to create realistic terror attack scenarios to train and practice for. The list does not include all causes, but it gives a comprehensive set of causes of terrorism (Transnational Terrorism, 2007).

Rapid modernization and urbanization such as high economic growth has a strong correlation with the emergence of ideological terrorism. This highly represents countries with sudden wealth, where new radical ideologies. The relationship between terrorism and democracy shows high correlations. It is proven that a lack of democracy, civil liberties and the rule of law are preconditions for domestic terrorism. Countries with weak political state struggle to gain territorial control giving room for terrorists to perform safe training and exercise under good training facilities. Such as political violence, civil wars, revolutions or occupation may increase the acceptance of terrorism. When people grow up in cultures with hate or revenge against other national groups it will most likely increase the acceptance of terrorism and violence. When there are power distances and hegemony between groups, the oppressed group will be tempted to act with terrorism to gain political impact. Groups who feel discriminated based on their ethnic or religious origin can apply to terrorism when their rights

to equal social and economical opportunities are denied. Another condition creating motivation for terrorism is the lack of political participation (Transnational Terrorism, 2007).

Summary

In this chapter we have presented the theories is the foundation for theoretical framework in this thesis. The chapter starts up with an introduction to preparedness team theory and theories related to managerial roles. Then we present theory related to the independent variables we examine in this study and the main theories are organizational culture, preparedness exercises, preparedness institutions, operational context and different types of terrorism. We have also provided a basis for the choice of the theoretical framework, that we think are necessary to answer the research question. These theoretical approaches are the foundation of the data analysis we conduct in chapter 5.

3.0 Methodology

The aim of this chapter is to explain and argue for how this research has been conducted methodological. The chapter covers the choice of research method and research design and gives a detailed description of the data collection. The data in this research is provided to give good answers and understanding of the research question and the topic that is being examined (Easterby-Smith, 2012). In addition arguments are given why we have chosen the preferred approached instead of others. Further this chapter explains which interview participants, which represent the population, that have contributed and why this selection is considered a good sample size for this research. Finally an explanation is given of the data analysed, an evaluation of its validity, reliability and its ethical considerations.

3.1 Research Design

Research is according to Booth (2008) about finding the right information, evaluate it and report is clearly and accurately to solve a problem or answer a question. Easterby-Smith (2012) on the other hand see research as a process where data is collected, analysed and interpreted to clarify a conclusion.

The research design explains how the research is organized, how the data is collected and how the data is analysed to answer and explain the research question (Easterby-Smith, 2012). It is primarily the research question and the purpose of the research that determines what research method that is being used. The time limitations and the length of the research also have an impact on the choice of research method (Yin, 2009). In a research project the objects can be divided into three parts with the aim to either explore, describe or explain questions (Easterby-Smith, 2012).

The philosophical position is the underlying factor in the research design, and researcher draw from different epistemological perspective when conducting their research. Epistemology is different ways of enquiring into the nature of the world and will affect the methodology the researcher chooses to address (Easterby-Smith, 2012).

According to Easterby-Smith (2012) there are two different views on how to conduct research, positivism and social constructionism. A researcher with a positivistic view sees the world as external and measure properties through objective methods instead of sensations and

intuitions. The social constructionist on the other hand see the world as not objective and exterior, where peoples communicate their experience with thoughts and feelings.

As researcher we view the world as socially constructed, which gives meaning by people. The aim of the research is to increase the general understanding of how the managerial roles within the preparedness team should be strengthened to handle terror threats in the Barents Sea. This research is therefor based on social constructionist where we as researcher take part of what is being observed and our results are based on a general understanding of the situation through rich data collection.

3.1.1 Explorative research

Explorative research is used when the researcher tries to provide insight and understanding of phenomena, where the research process is flexible and unstructured. The analysis method most often used in explorative research is collection of primary data through a qualitative research design. Because little is predetermined, the exploration research is flexible and allows the researcher to account for unexpected conditions. In exploratory research the researcher often only formulate a problem statement in the beginning to emphasize the topic (Booth, 2008).

Explorative research is often used when problems has not been clearly defined yet related to new solutions in new areas. The method is used when the researcher try to develop some basic understanding of the topic, and it is a proper method to use when there is not explicit set of hypotheses with large amount of available data (Easterby- Smith, 2012). This research has an exploratory design, since the how the managerial roles within the 2nd line preparedness team should be strengthened to handle terror threats in the Barents Sea have not been clearly defined in other research. In this research we try to establish the relationship between dependent and independent variables (Easterby-Smith, 2012).

3.2 Qualitative Research Design

Quantitative and qualitative designs are two different approached of conducting a research. It is highly important to understand the difference between these techniques in order to find the most proper way of collecting primary data for the problem statement and question (Easterby-Smith, 2012).

Quantitative research is used to solve problems through generating numerical data or data that can be transformed into useable statistics. This type of data is used to quantify attitudes, opinions, behaviour and other defined variables and thereafter generalize results from a large sample population. The quantitative research is much more systematized and structured compared to qualitative research. It can include different types of surveys, such as online, paper, mobile, face-to-face and phone (Wyse, 2011).

Qualitative research is defines by Silverman (2004 p.17) as "*research that seek to provide understanding of human experience, perceptions, motivations and behaviours based on description and observation by utilizing a naturalistic interpretive approach to the subject and its contextual setting*". Qualitative research is primarily exploratory research. It strives to dig deeper into the research problem and the question using different types of unstructured or semi-structured techniques. Some common examples are interviews, both in groups and individually, observation and interaction. Compared to the quantitative research the sample size are smaller, but more data is collected from each participant (Wyse, 2011).

Both quantitative and qualitative research can be used to answer our research question, together or alone. Quantitative research is often used to conduct a large enough sample with relevant information and experience. Quantitative research is often less flexible and it would be difficult to gather clear and good data used as exploration in this study. We seek to explore how different independent variables influences how the managerial roles in the preparedness team ability to be strengthened. It is therefore appropriate to use qualitative research to gather data and information through words that provides us with rich and informative data. By using the qualitative research design we are able to discover the views, perspectives and opinions among our interview participants about the topic that are relevant to be able to answer the research question (Easterby-Smith, 2012).

3.3 Data Collection

Data is collected to use as evidence to support the claims in the research, and includes everything that are relevant to answer a question. Data is inactive until the moment you use it to support a claim when answering the research question, then it will become a evidence (Booth, 2008).

This research project consists of both primary- and secondary data collection. The primary data is collected through interviews with participant from the petroleum industry and the authorities. The Secondary data collection is mainly based on former petroleum research, company and government reports, articles in newspapers, magazines and online, books and presentations from seminars. Both the primary and secondary data results are implemented in the data chapter and are analysed in analysis chapter (Easterby-Smith, 2012)

3.3.1 Secondary data

The secondary data provides the raw data used as evidence to support a claim. It is difficult to write a research paper without using secondary sources as a foundation (Booth, 2008).

"Secondary data is information that already exists in form of publications or other electronic media, which is collected by the researcher" (Easterby-Smith, 2012 p.12) . Organizations and individuals collect their own data for several reasons. Firstly there are documents that are obligatory to be published due to regulatory reasons, in addition are earlier and future performances also collected. Not all of this data is confidential and researchers are able to access some of it through archives and data base systems. The secondary data collected in this research are mainly from petroleum companies, the government and other petroleum actors. The advantage of using these reports, articles, seminar notes and books is to get an overview of earlier, current and future research within the topic, and to get an up to date understanding and knowledge of the area that are being examine.

There are some disadvantages using secondary data. Firstly the researcher does not have control of the sample and the specific data collected, when using others research. Secondly the data may be uncertain and not correct. Therefore it is extremely important to use reliable and right sources (Easterby-Smith, 2012). In this research we feel confident that the secondary data is trustworthy with high quality. This information has been necessary for us to collect, to build a strong background knowledge that was needed to provide relevant and high quality interviews. The information gathered from secondary data has also helped us discover important research elements and areas that are interesting to discuss further in the interviews and in the analysis part.

3.3.2 Primary data

Primary data is defined by Easterby-Smith (2012 p.12) as "*new information that is collected directly by the researcher*". Primary data gives new insight and information on areas that the secondary data does not cover. This gives the researchers the opportunity to go deeper into old research areas and/or explore new areas of research. In this study we have collected primary data through in-depth interviews, which is a time consuming process. By collection own data through interviews this gave us better control and structure of the material gathered, and it also gives a greater confidant that the data is credible and correct related to the research question.

In this research we have gather secondary data from different relevant informant, within their expert area. Since the collecting of primary data is both time consuming and costly, we have interviewed three participants face-to-face while they were visiting the University of Nordland (our location) on different occasions. Another interview participant was interviewed by telephone. The main disadvantage with doing a phone interview is the risk of bad sound quality where it could be difficulties to hear what is being said and where misunderstandings and bad formulations can occur. When transcribing the interview some of the information that was given became unclear, but it was possible for us to memorize what was said on those blank spots. Another disadvantage using phone interviews are the lack of body language, facial expressions and other physical impressions that can have an influence on the interview. We therefor only conducted one interview over the phone, and this was mainly to save time.

Four interviews were performed face-to-face where we travelled to the participant's locations in Oslo, Stavanger and Bergen. These participants were important informants for our research project and it was therefor important that these interviews contained the best quality and accurate information as possible. In addition we saw the value of visiting the rooms the preparedness team operate in to get a better understanding of what is really happening during a crisis situation, related to the different managerial roles.

The more the researcher plan what exactly what they needs to know during a interview, the more efficiently the primary source will be (Booth, 2008) To make the interviews as successful as possible an interview guide was sent in advance to all the participant. This was done so the participants could be prepared with the necessary information and consult with others in the company which information they could share about a sensitive topic. The

interview guide was not a set program for the participant to follow, but more of a guideline through the interview where new questions and themes were added regularly throughout the interview.

An external partner did the transcription of all the interviews. This saved us a lot of time and made it possible for us to focus more on how to use the information gathered from the interviews and analyse it.

3.3.3 Semi-structured interviews

In our research we have chosen to use the semi-structured interview method to collect the primary data. Interviews are defined as the collection of data through language and conversations and are seen as valid and reliable data. There is a wide range of different types of interviews from unstructured and informal conversations to highly structured ones using standard questions for each respondent. Semi-structured interviews are a method in between these methods. Semi-structured interviews are unstructured and non-standardized where the researcher normally have an own list of themes and questions that are specified linked up to the single participant. This is done to reflect upon those areas that are most know and understood by the participant (Millmore, 2007). Semi-structured interviews as research method has given a high degree of confidentiality, as the replies of the interviewees tend to be more personal in nature. In addition the interview participants have shared own information and experience on new areas outside the researchers existing area, that are of relevance for the research problem (Easterby-Smith, 2012).

Semi-structured interviews were chosen due to its rich textual data and the ability to have structured interviews, but with flexibility through follow up questions and the opportunity to discuss other relevant questions and themes. Our research situation is highly complex and confidential, where it is required that we as researcher flexible. It is also a good method to use seeking to understand the respondents "world" and to understand the participant's opinions and believes about the research problem (Easterby-Smith, 2012). We provided our interview participants an interview guide a couple of days before the interviews. This gave both the participants and us control and time to prepare for the areas and questions that was covered in the interview. The interview guide differed from whom we interviewed and was tailor-made for each participant based on their role, function, and background, and the company they

represented. Despite this there were mainly four topics that were discussed in each interview guide:

1. Preparedness management and exercises
2. Managerial roles
3. Terrorism attacks
4. The Barents Sea

After the first interviews the four main topics were still relevant to examine further, but adjustments were made based on new information where some topics and questions was covered well while others were still unclear. *"Terrorism attacks on oil and gas installations"* are a sensitive topic, where all of our interview participants had limitations on what they could discuss and give out of information. These restrictions created some limitations on our research and we therefore tried to focus on those areas that were open for discussion and public sharing. Throughout the interviews we also realized that several areas that had been given less attention would be relevant to examine further and in more detail. Overall the interviews compensated each other very well, where we got shared information and opinions on the same subjects and on different subjects. The interviews provided us with a wide range of relevant and accurate data, where we got a clear and diverse insight in how the different areas influence how the different actors prepare and handle a crisis situation. We also got the impression that all of our interview participants felt comfortable and interested in sharing relevant information to an important and interesting research problem.

3.3.4 Sampling

To collect valid primary data, it was important to interview the right organizations and people that are involved and familiar with the processes and systems used to prepare and handle terrorism threats on oil installations in the Barents Sea. The population refers to the whole set of entitles that the research problem is linked to (Easterby-Smith, 2012). In our research project the represented population becomes the people working in petroleum organization, governmental actors and other external actors that influence the preparedness management systems. Sample is the people drawn from the population and is a very common used tool both for surveys and interviews. The optimal would be to interview all the relevant members of the organizations, but this is impossible due to time and access limitations. It is therefore

important to pick a sample that gives the best representation of the population (Easterby-Smith, 2012).

In this research it is highly difficult to state the probability of each member of the population that are being sampled. We are therefore using the non-probability sampling design that is defined by Easterby-Smith (2012 p.228) as *"a sampling designs where the likelihood of each population entity being included in the sample cannot be known"*. This sampling method can never give the same level and quality as probability based sampling where each entity that are part of the sample is known. There are several types of non-probability sampling methods. In this research three of them are being used: convenience sampling, quota sampling and snowball sampling. Convenience sampling is a method used to select samples based on their availability. In our research 3 participants were interviewed at the University, due to their easy access, but also due to their highly relevance for the research project. Quota sampling has been used to divide the different organizations into actor groups according to their role and function within their company. Basically one or two people from each actor group were chosen to represent their organization. The aim is to make sure that each of the categories is represented according to the quota proposition. Snowball sampling is the process where the researcher asks the already chosen participants about other relevant participants to interview. In our interviews we always asked if the participant had any recommendations of others to interview that would be relevant and useful to interview. This type of sampling method gave us really good feedback information and where many of our interview participants are based on this method (Easterby-Smith, 2012).

All together there are 9 interviews with 10 participants conducted in this research: 4 from Statoil, 2 from ENI Norge, 1 from The Norwegian Police, 1 from DNV-GL, and 1 from Acona. The two oil companies were chosen based on their current and future present in the Barents Sea, Statoil with its fields Snøhvit and Johan Castberg and ENI Norge with its Goliat field. We saw the need of interviewing several employees within the same company due to the broad roles and responsibility area within each oil company.

In Statoil 2 out of the 4 participants are anonymous and are called Participant 1 and Participant 2 further in this thesis. The two other participants are from Statoil's safety and sustainability apartment in the Harstad office, where Lill Harriet Brusdal is manager and Gunn Stabell is team leader. Lill Harriet is an earlier offshore installation manager and gave us relevant information in terms of managerial roles in crisis situation, while Gunn Stabell

gave us more general information on how the preparedness management and crisis management systems functions.

From ENI Norge the two representatives that are located in Stavanger, are from the HSEQ apartment, where Liv Nielsen is manager and Ellen Waldeland is advisor. The interview with Liv Nilsen was done early on in the research, which makes the questions, and discussions here quit different from our second interview with Ellen Waldeland. In the interview with Liv Nielsen a general introduction was given on the topic, what areas that were possible to examine further and what areas that was restricted. In the interview with Ellen Waldeland a more detailed description was given of the preparedness system and the processes that were done within the company and with other actors to prepare and handle crisis situations.

The Police are in charge when a crisis situation takes place and is an important participant to interview in terms of their role and how they operate during a crisis situation. Also how the police practice and set up exercises were asked. The person who was interviewed was the police inspector Per Jacob Solhaug, who works as a liaison for the Police at the Norwegian joint Headquartes at Reitan. He therefor also provides us with relevant information about whole national preparedness system.

A representative from PSA was also interviewed. The PSA are the governmental regulator with responsibility of safety, emergency, preparedness and the working environment in the Norwegian petroleum industry (Petroleumtilsynet, 2014a). They are an important participant to interview in terms on how they work to secure oil installations against attacks, such as terrorism, and how they regulate and test the oil companies preparedness systems.

One representative from the company Acona, providing service and competence to petroleum companies, was interviewed. Kurt Andreas Skog is senior advisor within Acona and gave us relevant information on how they work with petroleum companies and with other actors to prevent, prepare and handle crisis situations.

Also one represent from DNV-GL was interviewed. Jon Jerre is positioned as associate director within the oil and gas sector and was able to provide us with relevant information on those areas where they implement own models and systems to help petroleum companies improve their existing security, preparedness and crisis systems.

Name	Position	Company	Place	Interview type	Date	Time
Per Jacob Solhaug	Ass. Cheif of Police	Police liaison Officer to the Norwegian Joint headquarters	Bodø	Face-to-face	18.02.14	13.00-14.00
Liv Nielsen	HSEQ Manager	ENI Norge	Bodø	Face-to-face	20.02.14	16.30-17.15
Lill Harriet Brusdal	Manager safety and sustainability	Statoil	Bodø	Face-to-face	19.03.14	12.30-13.30
Anthoni Larsen	Senior advisor	PSA (Ptil)	Stavanger	Face-to-face	25.03.14	11.30-12.30
Ellen Waldeland	HSEQ Advisor	ENI Norge	Stavanger	Face-to-face	25.03.14	14.00-15.30
Gunn Stabell	Team leader safety and sustainability	Statoil	Bodø	Phone	27.03.14	10.00-11.00
Jon Jerre	Associate Director Oil and Gas Sector	DNV-GL	Høvik	Face-to-face	10.04.14	14.00-15.30
Kurt Andreas Skog	Senior Advisor	ACONA	Stavanger	Face-to-face	11.04.14	10.00-11.30
Participant 1&2		Statoil		Face-to-face	11.04.14	14.00-15.30

Figure 7 - Overview of the interview participants

3.4 Data Analysis

The empirical data collected in this research project has been collected through semi-structured interviews. The interviews have been recorded and transcribed into text by an external person. Together the transcription from the 9 interviews consisted of 165 pages. This is a large amount of secondary data collected, where irrelevant information needed to be cleaned out. While reading through the interviews important and new material quotations were marked in different colours between the participants. This was done to distinguish the different participants and give a better overview and understanding on what areas and opinions the different participants covered. This was also done so the participant themselves could approve the quotations in the thesis by looking at their own colour.

The written interviews were looked through several times to make sure that the correct data was collected and that no parts where missing. The data used from the interviews was then implemented into the data chapter where the material is divided between the same four themes as in the interview guide. There will therefore only be one data chapter covering both primary and secondary data that are further analysed in the *"data analysis"* chapter.

3.5 Reliability and validity

In a research project the validity and reliability of the work done needs to be evaluated. Easterby-Smith (2012 p.347) defines validity as *"the extent to which measures and research findings that provide accurate representation of the things they are supposed to be describing"*. For the research to be valid it is important to use the most appropriate methods to collect and analyse the data. Validity also covers the fact that the findings and results need to be valid enough to be used in other contexts and settings. Reliability says something about if a research project will produce the same results and scores as another research project carried out the same basis. In most cases it would be unlikely to have the same results performing the same study under similar conditions and circumstances (Easterby-Smith, 2012).

Attention needs to be given to reliability and validity to avoid errors. Errors can occur due to human mistakes such as poor choice of methods, choosing wrong samples and wrongly interpretation of data. One-way of evaluating this is to through internal validity asking critical

questions such as: Are the right questions asked? Is the information given trustworthy? Are the respondent's chosen the right ones? External validity can be asked in terms of: Does the data change if other participants were chosen? If the interviews were done differently or other methods were used would the outcome be different?

In this research project the interview guides are based on a throughout examination of primary data and the participants background, knowledge and roles. The participants gave feedback stating that our topic and questions was up to date and highly important. There are no signs showing that any doubt should be put on the respondent's statements and information. Due to the research large collection of secondary data and the variety of actors, with different roles and perspectives, this sets a strong confidant that the results would still be the same if some of the interview participants and methods changed.

For the research to be reliable the researchers themselves needs to do honest, present the data in a logical way and interpret the data correctly. The total picture illustrates that the interview participants seemed very confident on how the processes and systems that were asked for functioned, and that these descriptions would not change drastically with other interview participants. The only thing that could be a problem in terms of reliability is if the researchers themselves interpret the information shared differently the outcome would be so too.

3.6 Ethical considerations

When conducting a research project ethical issues need to be considered during the process and after. There has been a pressure from several academics and organizations to adapt definite ethical codes and practices, where they have tried to establishment a common set of principles. Bell and Bryan (2007) have made a list of 10 ethical principles that researcher should follow. The first seven ones are about protecting the interests of the research participants such as: no harm should come to them, respect their dignity, inform them fully about the research, protection of privacy, ensure confidentiality, protect their anonymity, and to avoid deception. The last three focus on ensuring that the data collected is accurate and that the research lack bias through: avoid conflicts of interest, be honest and transparent and to make sure the research is not misleading (Easterby-Smith, 2012). In terms of protecting the interest of the participants and organization we have informed and asked for permission to tape the interviews. All our participants have agreed upon this, but have informed clearly that some names and organizations and particular information will be excluded due to the taping.

Not the tapes itself, but the written material used from the interview tapes have been sent to the participants for them to confirm if the material can be published or not. In our research we do not have any intentions of setting any of the participants or organizations in a bad light. Even though we as researchers are in control of the data obtained from the interviews, we are not publishing any data that can harm any of the organizations interviewed, especially the smaller ones (Easterby-Smith, 2012).

We have respect and understanding of the participant's privacy, where we have kept some of the participants anonymous on their request. As researcher we seek to build strong relationships with our participants finding a balance satisfying both parts interests. Throughout the research and after the research we have obtained a critical role to our own research where we have thought, reflected and prepared critical questions about our own research related to ethics and politics. This critical role has made us more observant and better to introduce ethical guidelines for the research project.

Summary

In this chapter we have presented the methodological choices we have done before conducting our research. We first present the choice of philosophical position; the research design and how we are addressing our research problem. We then argue for the choice of qualitative research and in-depth interview as data collection method. The chapter gives an overview of how we have gathered both secondary and primary data. In addition we have evaluated the reliability and validity of the data collection in addition to ethical considerations along the way. The following chapter will give an overview of the data collected in this research.

4.0 Empirical data

In this chapter we will present the empirical data, both secondary and primary data conducted in this research. The secondary data will be data that we have collected from reports, earlier studies, journals, articles etc. Information obtained from the interviews represents our primary data. This information is gathered from the participants: Statoil AS, ENI Norge AS, PSA (Ptil), The Norwegian Police, DNV-GL and ACONA AS. The list of participants is shown in the methodology chapter, and we refer to the participant with their last name, company and year in this chapter.

The first subchapter is related to the oil companies preparedness system. In this chapter we present the main preparedness team, the 2nd line and the roles included here. In addition we present all the support lines around the preparedness team – and in that way present the whole system. We also present data related to how the team exercise, both internally but also with other actors.

The second subchapter present data related to the Norwegian preparedness system. This chapter gives an introduction to the main laws and regulations the authorities sets for the oil companies operation on the NCS. We also present the different level in the national systems with different responsibilities during a crisis situation. We focus on the police preparedness system as they are they are responsible during a terrorist attack offshore on the NSC. In addition we have included some other external actors that has responsibilities due to prepare and handle terrorist attack.

The third subchapter is related to the Barents Sea as a complex and turbulent environment. First we present how the development in the area changes the recent years. Then we provide an overview of the challenges in the area related to infrastructure, lack of installations and resources.

The last subchapter, terrorism, gives an overview of the different views of what defines a terrorist. We present an overview of different factors that have changes the Norwegian terror threat picture, in addition to the different types of terror threats against offshore installations. Last we give an overview of how to asses the risk related to terrorism, and how the security culture within the oil companies has changes the recent years.

4.1 The preparedness organization: 1st, 2nd and 3rd line preparedness teams

The oil companies preparedness system is regulated by Norwegian laws and frameworks, where the Petroleum Act chapter 9 specifies requirement for security (Olje- og energidepartementet, 2004). The main requirements important for this thesis is:

Petroleum Act § 9.2: "Licensees shall at all times maintain effective emergency preparedness and are obliged to prevent or reduce harmful effects. The Ministry may issue new rules related to preparedness and measures, including required cooperation between several licensees" (Justis og beredskapsdepartementet, 2013 (4)).

Petroleum act §9-3: "The oil companies are required to implement and maintain safeguards to help prevent deliberate attacks on installations and always have preparedness plans in case of attacks" (Justis og beredskapsdepartementet, 2013 (4)).

Petroleum Act § 9-4: The petroleum installations on the Norwegian continental shelf follow several provisions of UNCLOS. Article 60 cf Article 80 nr 5 stipulates that: "*establishment of safety zones around offshore installations that are not exceed 500 meters*." With that limitation, the operators on the Norwegian continental shelf are required to establish safety zones, and these are in practices of 500 meters (Justis og beredskapsdepartementet, 2013 (4)).

The goal of a company's preparedness strategy is to prevent, limit and deal with crisis situations. Preparedness is all technical, operational and organisational measures which prevent danger and threats from developing into crisis situations and the process of reducing and preventing damages from escalating when a crisis has occurred (Njå, 1998). Thereafter the petroleum company define potential threat and accidents situations that the preparedness system needs to prepare for (Eriksen, 2011). There are different ways for the oil companies can conduct a list of potential crisis scenarios:

1. Defines situations of hazard and accidents (DSHA)

This method is the most common in the Norwegian petroleum industry, defining adverse events through risk analysis, experience and qualified evaluations (Njå, 1998).

2. Worst case

This method focus on extreme conditions in a preparedness situation, and often includes several attacks at once representing crisis situations that are more difficult for the preparedness system to handle than DSHA. Worst case scenarios are defined without direct use of risk analysis, but where indicative information is used instead (Njå, 1998).

3. Class of situation

This method categorize and classifies different situations without focusing on inspections details (Njå, 1998).

4.1.1 Organization of the oil companies preparedness system

The oil companies are responsible to prepare for crisis situations within all of their operations and activities. The structure of the preparedness system may vary between the petroleum organizations, but they all consist of a 1st, 2nd and 3rd line preparedness team as Illustrated in figure (Njå, 1998):

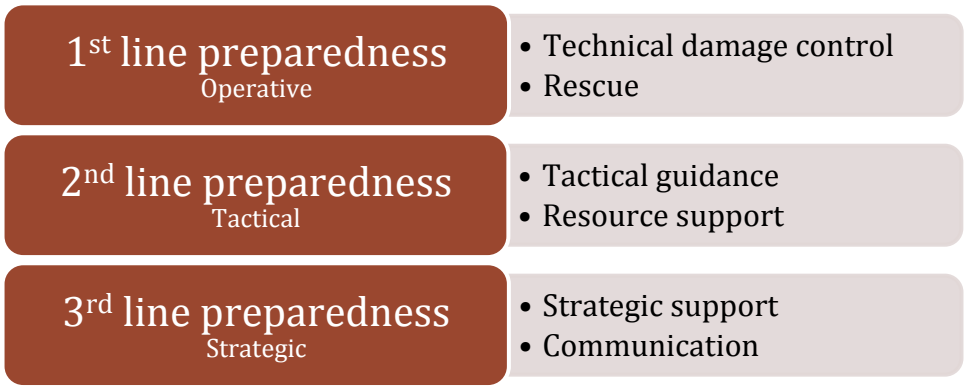

Figure 8 - Different organizational levels in the preparedness system (STATOIL, 2012)

The 1st line preparedness team is the operative team on the platform or installations during the crisis situation (Njå, 1998). They focus mainly on the technical damage control and rescue of personnel. Their main responsibility is to implement measures on the installation during the crisis situation (Sommer, 2013).

The 2nd line preparedness team represent the tactical level supporting the 1st line with resources and guidance, assisting the 1st line to solve the crisis situation (Sommer, 2013). The 2nd line also coordinates all arrangements with the 1st line, authority and other preparedness participants within the organization (Njå, 1998).

The 3rd line preparedness team is the strategic support during a crisis situation mainly (Sommer, 2013). The 3rd line represent the main office or head quarter of the petroleum organization and have the responsibility of coordinating economical, legal and political questions (Njå, 1998).

4.1.2 1st line preparedness team

The 1st line preparedness team are located in the crisis situation and represents the preparedness system on the oil installations (Waldeland, Eni Norge, 2014). The managerial roles within the 1st line preparedness team are presented in the figure below:

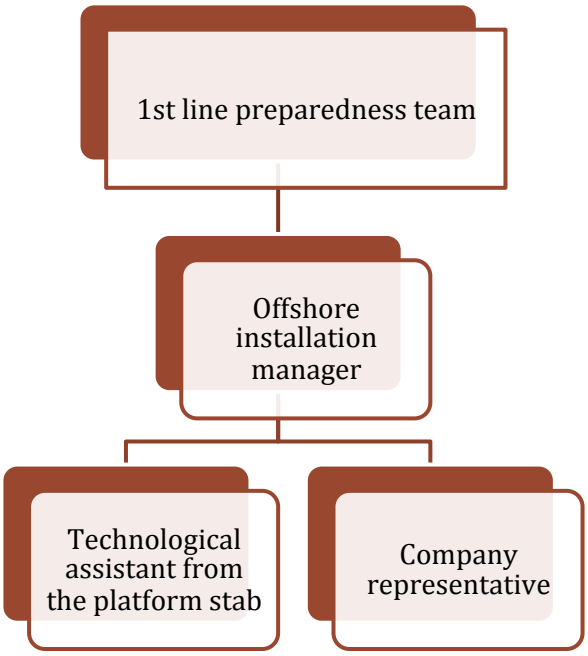

Figure 9 - Organization of 1st line preparedness team (Haug, 2011 p.7)

The 1st line preparedness team on an oil installation has different roles and responsibilities. The structured of these roles are fixed representing permanent team roles with given responsibilities on the installations (Brusdal, Statoil, 2014).

The offshore installation manager (OIM) is the person in charge on the platform during a crisis situation. The OIM is responsible of informing and to update this information during the crisis situation to the rest of the 1st line team members (Stabell, Statoil, 2014). In addition the OIM is responsible of communicating with the 2nd line preparedness team onshore (Brusdal, Statoil, 2014). When a crisis situation occurs the OIM is in charge takes the final decisions.

The OIM needs to have good communication, collaboration skills able to take decisions under pressured situations. The manager needs to ensure that the team functions optimal and needs to gain trust from its team members taking decisions on the behalf of the team. To be a good OIM you must be able to plan, inform, control, support, implement and evaluate. The OIM needs to take decisions based on own judgment and knowledge and input from the other team members (Skog, Acona, 2014). These decisions need to be taken during stressful situations at the right time (Stabell, Statoil, 2014).

In addition there is a member of the platform stab that are required to assist with technical installation knowledge during a crisis situation. This knowledge should make the OIM capable of mapping out where the crisis situation is located on the platform and what potential threats this crisis can cause and how to solve it. This manager also advises the OIM on what and when to shut down parts of the production (Brusdal, Statoil, 2014).

Also there is one member responsible for the blackboard located in the response centre on the platform. This person is responsible to write every action that is going to be performed during the crisis. Each action is given a deadline and a time for it to be performed. This information is visible for everyone within the preparedness room. The blackboard is photographed as a documentation of what has been said and agreed upon. Who the blackboard responsible is varies between the platforms, but in most cases there is one from the platform management group (Brusdal, Statoil, 2014).

In addition to the 2nd line preparedness team, the 1st line preparedness team has other support functions during a crisis situation such as: The Joint Rescue Control Centre (JRCC), standby vessels, other ships in the area, other offshore installations, medical team and helicopter services *(Haug, 2011)*.

4.1.3 2nd line preparedness team

The 2nd line preparedness team function as a support line for the 1st line preparedness team. The 2nd line preparedness team is the team we refer to as "preparedness team and its managerial roles" further on in the study. The main responsibilities within the 2nd line team are the coordinate of actions that should be taken, and what resources and allocation of these resources assisting the 1st line and the crisis situation. They will support the 1st line preparedness team with obtaining additional resources, handling media and relatives, managing the operation and notifying other partners, government and contractors (Waldeland, Eni Norge, 2014). The following roles within the 2nd line preparedness team are illustrated in the figure bellow:

Figure 10 - Organization of 2nd line preparedness team (Haug, 2011 p.7)

The oil companies 2nd line team has a broad responsibility and should be prepared to handle all potential crisis situations. The 2nd line preparedness team consists of approximately 70-80 members, with different background, depending on the size of the oil company. Every manager is in a way a specialist in their role, but they are all part of a team that work together and takes decisions together. There are few decisions that are taken individually by each member (Waldeland, Eni Norge, 2014).

The action manager is the commander and leader of the whole preparedness team and has the authority from the director of the company to handle a crisis situation. This authority includes taking decisions at any cost to secure that the situation is handled properly. The main task for

the action manager is to keep an overview off the situation, coordinate all the actors and develop strategies to handle the situation. In addition the action manager is responsible for providing necessary information and updates to the 3rd preparedness team (ENINorge, 2012).

The media handler/coordinator is responsible for the companies' media strategy and statements that should be released to the press. The media coordinator has the main responsibility to provide the leader of the media group in the 3rd line with the necessary information (ENINorge, 2012). The 2nd line team also has a call centre to handle phone calls from the press, where the media group will only have a limited picture of the situation and only see what the company wants to release to the public (Stabell, Statoil, 2014).

The authority response is responsible for notifying the authority and licence partners with updated information at regular intervals. They are also responsible for writing a report to PSA after a situation is over (ENINorge, 2012).

The environmental role is responsible of giving instructions to an environmental group on what actions that needed to be done to prevent oil spills and other environmental damages during the crisis situation. The manager are responsible for the dialogue with NOFO and the costal guard (ENINorge, 2012) (Waldeland, Eni Norge, 2014).

The duty officer is are responsible of communicating with other actors, such as drilling supervisors, during the crisis situation (ENINorge, 2012). The duty officer is characterized as a person with long experience from the industry and within offshore operations with good knowledge on understanding the circumstances on the platform during a crisis situation (Waldeland, Eni Norge, 2014).

The resources manager is also responsible of having contact with the JRCC and contract companies during the crisis situation (ENINorge, 2012). Some oil companies have two resource managers one responsible for helicopters and one for vessels. The managers have authority to obtain the necessary recourses regardless of the amount of money, and if they require assistant from JRCC they will get that immediately (Stabell, Statoil, 2014).

The next-of-kin manager is responsible of providing information and to ensure that the families and friends of those offshore personnel that are threatened during the crisis situation gets the assistant needed (ENINorge, 2012).

In addition to these roles some companies has their own IT and Telecom manager who are responsible for solving any problems along the way. The manager will also be responsible for logging and writing reports from the meetings. There will also in some companies be one person responsible of updating the blackboard at all times (ENINorge, 2012).

The 2nd line have a support network during a crisis situation includes actors such as: the Police, the military, PSA, the coast guard, medical services, JRCC, NOFO and the owner of the rig *(Haug, 2011)*.

There are no templates for the managers of the 2nd line preparedness team, but all the managers' needs to function together as a team. The common denominator for all the roles in the 2nd line preparedness system is that they all have experience from crisis situations and good understanding of how the situation looks like on a platform during a crisis situation (Waldeland, Eni Norge, 2014).

The first thing that happens when the preparedness team gathers, in the 2nd line preparedness room, is to assess the situation based on the information available. Understanding the situation is the first task in any preparedness situation, and it is important that the whole team understands what is really happening. Then the team evaluate a worst-case scenario for the situation and where all members focus on providing necessary resources to solve that scenario. After the first meeting the team provides a meeting discussing changes that have taken place along the way. This ensures that all the team members have a common understand of the situation facing them so that they can further work towards common goals and strategies to solve the crisis situation (Waldeland, Eni Norge, 2014).

4.1.4 3rd line preparedness team

The 3rd line team is the highest preparedness level and their main task is to quality assure the 2nd line preparedness team and ensure access and necessary knowledge during the crisis situation. In addition the 3rd line is normally responsible for handling the media during a crisis situation (Waldeland, Eni Norge, 2014).

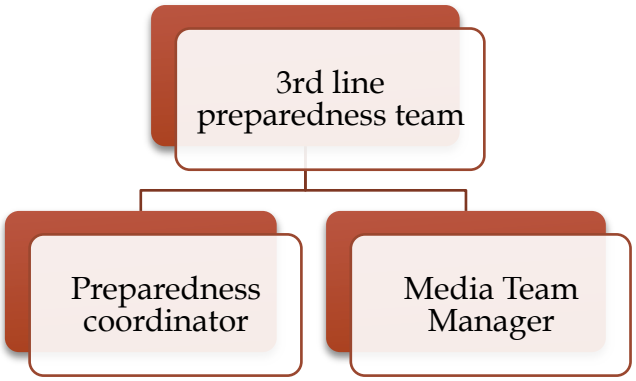

Figure 11 - Organization of 3rd line preparedness team (Haug, 2011 p.7)

The 3rd line preparedness team, the strategic level, is responsible for the company's policy and to handle the organizations reputation during and after the crisis situation. This responsibility should not be outsourced (Skog, Acona, 2014).

The preparedness coordinator manager is responsible for notifying the leader in the oil companies and other stakeholder about the situation. The manager also needs to ensure that the 1st and 2nd lines have the necessary information and expertise available to solve the situation (Stabell, Statoil, 2014).

The media team manager is the leader of the media-handling group and controls the media outflow during the crisis situation. The media group's main responsibility is to prepare press release, hold press conferences and answer calls from the media (Waldeland, Eni Norge, 2014).

The oil companies wish to start up normal process as soon as possible after a crisis situation. For this process to be successful the petroleum companies need to hinder damages of their reputation. This is highly dependent on how the company handles media, in terms of information during the crisis situation and after. Their reputation also depends on how the crisis situation was handled and how well prepared they were (Waldeland, Eni Norge, 2014).

4.1.5 External actors

It is resource intensive for many oil companies to establish a preparedness system with good quality that are available at all time. It is also expensive to develop and maintain a preparedness organization, and many organizations therefore choose to outsource some or the whole preparedness system to external actors. The external actors then function as a support line for the petroleum companies (DetNorske, 2010).

Acona is one external actor offering preparedness solutions for oil companies, rig owners and service companies. Some of these customers buy the whole preparedness package and others just pick some of the services such as media centre and next of kin. Acona has three identical emergency rooms and are able to handle several situations simultaneously. The oil companies can use their emergency facilities for meetings with their 3rd line preparedness team, where they also get access to Acona's crisis emergency tool (CIM). Acona also offers their customers an administrative representative providing assistance during a crisis situation (Skog, Acona, 2014).

Most of the larger oil companies have an in house preparedness organization, but they can still outsource parts of the preparedness system. This means that there are even more actors involved in the crisis situation. The operating company always has the overall responsibility for health, safety and environment and it is extremely important for a company that delivers preparedness services to have exercises with their costumers to be able to know their roles and responsibilities in a crisis situation (Skog, Acona, 2014).

Acona can offer a complete 2nd line preparedness solution to the oil companies, where the 1st line on the platform notifies them during a crisis situation. The operator has the overall responsibility in a crisis situation, which requires a close cooperation between the Acona and the oil companies. Acona can represent both the rig and the operator and solve this with two parallel preparedness organizations. *"Handling both the operator and the rig owner is one of the toughest, demanding and challenging situations for Acona"* (Skog, Acona, 2014).

4.1.6 Exercises within the preparedness team

The oil companies are required to practice on every DSHA that they have listed in their preparedness plan and PSA supervise if the companies do this in practice (Larsen, PSA, 2014). It is important to not underestimate the importance of performing exercise. Events such as the 22th of July show how prepared the Norwegian health service was to handle the situation, because they have conducted exercises and were well prepared to handle different situations (Nielsen, ENI Norge, 2014). The Norwegian health care has more complex and organized exercises where they practice more across different actors and scenarios. The operators on the NCS can learn from the importance of the interplay and distribution of roles between the different operators in crisis situations (Brundtland, 2013).

The regulations for the oil companies' state that they should continuously improve everything they do, and this is especially important related to security. This is on of the main reason for why the companies use so much time on exercises and evaluation of the results (Waldeland, Eni Norge, 2014).

The operating oil company must define every event that the company needs to protect oneself against. This collection of possible events is called defined situations of hazard and accident (DSHA) and is the basic for the planning of preparedness exercise. Not all oil companies and installations have the same DSHA, where each DSHA are customized to the installation based on the organizations capacity (PTIL, 2013). The oil companies work systematic related to DSHA where they first identify the relevant DSHA for the platform, then do a preparedness analysis which states how to handle the situation and last evaluate how the situation can escalate. Then the oil company decides how to exercise on the DSHA, to test how prepared they are, alone or in cooperation with other actors. The oil companies have both internal exercises with the different preparedness lines and external exercises where they invite other actors to participate such as the police (Waldeland, Eni Norge, 2014).Terrorist attack is one of the DSHA, which means that the oil companies are required to exercise and develop expertise to be prepared for this situation (Participant 1&2, Statoil, 2014).

An oil platform can have 17 different DSHA and every 14 day the 1st line preparedness team practice on a DSHA, regulated by a rotation system. This means that they go through every DSHA several times every year. The 1st line preparedness team also have tabletop exercises the other week, focusing on discussing how to solve different situations. Each year there will

also be a verification exercise, where the oil company choose on DSHA that they need to practice on and external actors evaluate and verify the company after the exercise (Stabell, Statoil, 2014).

The 2nd line team practice on every DSHA, but they don't focus so much on the DSHA because the organization will remain the same independent of the crisis situation. Therefore the exercises in the 2nd line team focus more on communication and collaboration internally in the team and cooperation with the other lines in the preparedness system (Waldeland, Eni Norge, 2014).

The 3rd line team have strategically exercises, where they focus on the different roles and responsibilities during a crisis situation. Individuals need to know their responsibility, for the leader to be able to manage the situation (Skog, Acona, 2014).

One of the main challenges related to exercises is that the oil companies don't have the time and money to practice as much as they want, with all the actors who will be present during a real situation. A full-scale exercise requires a lot of resources and many operators has to prioritize some exercises to participate in (Waldeland, Eni Norge, 2014).

After an exercise it is important that the oil companies evaluate each of the roles in the team and write an evaluation report for further learning. It is important to evaluate the time aspect of the exercise, the resources that was used and communication along the way (Brusdal, Statoil, 2014).

4.2 The Norwegian preparedness system: an integrated system with several actors

The petroleum industry is the largest industry in Norway, where oil and gas activities accounts for the largest value creation. Norway was ranked the 4th largest exporter of oil in 2009, the 14th largest producer of oil in 2013 and the 3rd largest gas exporter in 2007 (Australian Government, 2012).

The Norwegian petroleum industry has moved from strict regulations and inspections by the Norwegian Government, to a more self-regulated system in terms of safety and security. Today Norwegian oil companies are responsible for the safety and security of their own operations and activities, and are required to implement crisis and preparedness management systems. Inspections still take place, but in an environment where the whole responsibility lays on the oil companies. The oil companies need to show how they will manage their systems and operations in a safe and secure way, where all specifications are clarified and operational processes are closely monitored. The aim of investigations done by the Government is to investigate what went wrong and to improve the current systems (Australian Government, 2012).

The Norwegian preparedness system is highly influenced and dominated by comprehensive laws and regulations, where the government allocates the petroleum resources. One of Norway's biggest strengths in the petroleum sector is the competence and knowledge about offshore operations in harsh climates. This is something the Norwegian government intends to further build on in the future (DNV, 2012).

The legal framework is set to maintain safe and secure business operations on the NCS (Australian Government, 2012). The national social security and emergency preparedness is based on the principles: responsibility, equality and subsidiary, introduced in the white paper no. 17 (2000-2002).

The principle of responsibility states that the ministry, enterprise or government agency is responsible for security in their area, including emergency preparations and executive service of crisis and disasters. The minister is responsible for all activities under his agency, including maintaining planning functions within their area (Justis- og beredskapsdepartementet, 2012).

The principle of equality states that the organizational form during a crisis should be as similar as possible to daily operations. The principle is an elaboration of the principle of responsibility, where responsibility within organizations and medium enterprises shall not be changed due to crisis management (Justis- og beredskapsdepartementet, 2012).

The principle of subsidiary states that crises should be handled at the lowest possible level, where the county and municipality have important roles. Those who are closest to the crisis will usually be the ones who have the best position to understand the situation and are also best suited to handle it. The principle of subsidiary does not apply to security crises such as a terrorist attacks (Justis- og beredskapsdepartementet, 2012).

These principles have proved to be adequate, but struggle to communicate and interact between the various responsible shareholders, which makes it difficult to see the community's total resource context. Experience from recent incidents show the importance of all stakeholders working together to solve the crisis in the best way. Criticism from research has stated that it has been to little emphasize on the requirement of good cooperation between the different shareholders. To ensure better cooperation, the Norwegian government has decided that the cooperative principle should be incorporated as a fundamental element in line with the existing policies (Justis- og beredskapsdepartementet, 2012).

The cooperative principles state that the authority, the enterprise or agency are responsible for ensuring the best possible synergies with relevant shareholders and agencies in the prevention, preparedness and crisis management phases (Justis- og beredskapsdepartementet, 2012).

The preparedness management system covers crisis related to both safety and security. There are no clear definitions of safety and security because of the high uncertainty and complexity related to the events. In this study we seek to clarify the difference between safety and security based on the definitions by Midttun (2013). Safety is defined as *"The risks within the company, where hazards and accidents results from own activities"*. Security on the other hand is defined as "*The threat from external actors, where attacks and events are caused intentionally by external actors, wanting to spread harm and fear*". This study examines the preparedness systems in the light of extreme terrorist threats as a part of security and therefore excludes the most of the safety part.

The authorities and the petroleum companies have more experience from safety issues than security. Safety has been the main focus for many years, while security is only in the start phase. Most of the initiatives to increase the focus on security come from the petroleum companies themselves. The petroleum companies see the importance of it and that security threats are closer to them than first thought. Security has been given a higher level of awareness and attention in the petroleum industry after the In Amenas terrorist attack. This is reflected through a higher demand from customers wanting consulting within security. Security has been on the agenda for some years, but more in terms of IT security, both internal and external information. It has also been a part of the PSTs threat evaluation for many years (Jerre, DNV-GL, 2014).

> *"Security is everyone's responsibility and companies who do not invest in preparedness, don't know about protecting the people and the value of the environment and the assets"* (Nielsen, ENI Norge, 2014).

4.2.1 Managerial levels in the Norwegian preparedness system

There are several institutions and companies involved in the Norwegian preparedness system. The actors cooperate and divide roles between them to prepare and handle crisis situations. During a crisis situation there are four managerial level divided among the actors (Politiet, 2011)

Figure 12 - The managerial levels in the Norwegian preparedness system (Politiet, 2011 pp. 30-32)

Political level:

The Norwegian Government is the highest political organ in the preparedness system, and is rapid summoned during a crisis situation. The Norwegian government policy related to preparedness is to ensure equal living conditions in all parts of the country. The Governments Security Committee (RSU) considers matters of defence and security political character. The Committee members can vary between the different ministries, but the Prime Minster, Foreign Minister, Defence Minister, Justice Minister and Finance Minister are permanent members of the security board (Politiet, 2011).

The Norwegian Government is responsible for handling a crisis situation such as terrorist attacks, which requires coordination of management, communication and awareness. The Government strengthen the police's crisis management capacity, but the police are still

dependent on other preparedness resources such as military forces and private companies. At a national level the government's main task is to exploit and control the local police so they can quickly respond to a crisis situation (Justis og beredskapsdepartementet, 2013 (4)).

After the 22th of July terror attack the Norwegian government presented a new strategy in their white paper focusing on the follow up the experience and potential for further improvements due to combating terrorist attacks. The paper presents an overall strategy against terrorism, with a number of specific measures called "Measures against terror - for a safer Norway" (Minister, 2013). The government's main task related to terrorist attacks is based on five goals:

1. *Preventin*g radicalization and violent extremism
2. *Cooperate* internationally to prevent and combat terrorists
3. *Prevent* and detect acts of terror2ism before they take place
4. *Protect* the community and make it prepared for terrorist attacks
5. *Manage* terrorist attacks in the best possible way

Strategic level:
The Norwegian Ministries represent the strategic level where each Ministry has their own preparedness plan and training to handle crisis situations within their area of responsibility. The Government Crisis Committee strengthens the cooperation between the Ministries when needed. When no Ministry in charge are selected The Ministry of Justice automatically takes the managing role in the crisis situation (Politiet, 2011).

The responsible Ministry shall compile the overall threat situation and present it to the political level as a decision foundation. The Ministry needs to make sure the media and the society are informed, coordinate activities with other departments and ensure that the necessary measures are done within the responsibility areas (Politiet, 2011).

The Government's Crisis Council (RKR) provides strategic coordination in complicated crisis, and there is a low threshold to convene the Crisis Council. The main tasks is to evaluate questions about the leading Ministry, ensuring high quality coordination actions, and ensure clear and coordinated information to the media and the society (Politiet, 2011).

The Government's Crisis Support Unit (KSE) functions as an administrative resource for the Ministries and the Government's Crisis Council in crisis situations. They work as a daily

support and assist unit in preparedness, but are not a part of the principle of responsibility, and does not cover any of the Ministries responsibilities (Politiet, 2011).

Operational level:
The National Police Directorate, representing the operational level, is the superior authority for the police districts and special agencies. Despite this the Police Chiefs and the Commanders have independent responsibility to carry out the police tasks (Politiet, 2011).

The Police Directorate is responsible for the daily police management process. During a crisis situation they give operational commands to the strategic level, and coordinate the police chiefs and commanders that are affected. They also ensure that personnel and material resources are available. The Directorate collects the processed information from the tactical level, coordinating cooperation with other actors on the operational level and prepare situational reports to the Ministry of Justice. The JRCC and The Police Security Service are a part of the operational level (Politiet, 2011).

Tactical level:
The Police Districts and The Specialized Agencies together constitute the tactical level. The Police have an important role in the regional preparedness management and needs to collaborate with several actors. The Police are entitled to connect with advisories and liaisons from other agencies and businesses. The Police Chief is responsible for the police in its own police district (Politiet, 2011).

4.2.2 The Norwegian police preparedness responsibility

In Norway the police are responsible of preventing and combating terrorism, which requires law enforcement and personnel with sufficient expertise. The police's terror preparedness is based on framework from the police directorate and the Police Act. Preparedness against terrorist attacks, require coordination effort involving several players such as the police, emergency service, military force and the owner of the infrastructure (Politiet, 2011).

The police are in charge of protecting national resources and the main political centre is located in Oslo, the main reason for this is that Oslo is the capital and need extra protection. Oslo as the main region has a higher concentration of police officer and resources in terms of the numbers of police per capita. The devices with national responsibility such as the emergency squad and criminal police are also situated in Oslo (Ulriksen, 2013).

The Norwegian Police Service is a department of the Royal Norwegian Ministry of Justice and Police. The department consists of twenty-seven regional areas and seven national police districts (Australian Government, 2012). Only four of these districts, Stavanger, Kristiansund, Nordland and Troms have oil and gas facilities and are responsible for the security on these (Justis og beredskapsdepartementet, 2013 (4)). The main oil and gas infrastructure is located in Rogaland Police district outside of Stavanger, and is therefore the main police district (Australian Government, 2012)

The Norwegian police districts are autonomous units and vary in terms of available resources and how they prioritize the use of these. There is also a tremendous variety in terms of opportunities for quick assistance from the neighbouring district. There is no relationship between the police strength in an area and its economic importance. Compared to other countries such as the Scotland where the police and military protect important terminals and oil installations to secure due to energy security, the security of oil installations in Norway lays on the petroleum companies (Ulriksen, 2013).

In addition to the ordinary 24/7-duty responsibility the Norwegian Police develop preparedness plans to handle extraordinary events and terror attacks. These plans help contribute to strong preparedness strategies that makes it possible for the Norwegian Police to adjust quickly and effectively in cooperation with national preparedness resources. It is the local police districts that are available during crisis situations such as a terrorist attack, and

must therefore have the capacity, expertise and equipment to ensure that the crisis can be resolved as well as possible in the initial phase (Politiet, 2011).

A terrorist attack on an oil platform requires immediate response from the Norwegian Police and the goal for the police would always be to have as much time as possible to prepare for the situation. In some cases the police want to win time to prepare an action plan, be able to reach the necessary resources and actors to solve the situation (Solhaug, Poilce, 2014).

The regional Police district will be responsible during a terrorist attack, but they will lack the equipment and capacity to handle the operation alone. The Police district in Oslo will be contacted, since they are responsible for the national resources such as bomb squad, emergency squad and the helicopter services. The Special Force will usually be sent out to the platform, since the emergency squad in Oslo are more trained onshore than offshore. The Special Force commander and its team will become a part of the team the Police Chief has established and are responsible for advising the military operations (Solhaug, Poilce, 2014).

The Police districts will also notify the Norwegian Headquarters at Reitan during a terrorist attack, which will gather their military resources. In addition the military special force in Bergen who is experts on handling operations at sea and coastguard will be notified. Marine soldiers will be responsible for boarding the platform, and there is often a need for helicopter with trained pilots to fly during a terrorist attacks, if the terrorist are armed (Solhaug, Poilce, 2014).

The Norwegian Police have annual exercises with the military, police and the industry where it is required that the oil companies participate when they are asked to. Operators and owners of the facilities as participants are included in the planning of the security scenario and the actual exercise. The annual exercises switch between the four districts each year but since most of the petroleum facilities are located in the Rogaland district the exercises happens more frequently in this area. One of the main exercises held by the Norwegian Police, Gemini, is a complex exercise which requiring a lot of preparation and meetings ahead. The Gemini exercise is a terror exercise where the Norwegian army contributes with their special force and expertise due to counterterrorism. The Police are responsible for managing the whole exercise where the police chief in the area is the leader of the situation. This is a complex exercise where preliminary work starts a year in advance. In addition to the Gemini exercise the Norwegian police has a annual exercise called TYR, where the scenarios for the

exercise changes from everything from natural disasters to organized crime (Solhaug, Poilce, 2014).

After a exercise, such as Gemini, the PSA, the participants, the Police district and the industry do an evaluation of the exercise (Australian Government, 2012). The evaluation of the exercises will not have any value if the evaluation doesn't get implemented into the preparedness system (Solhaug, Poilce, 2014).

The Norwegian police collaborate with the oil companies due to preventing terrorist attack on the NCS, and the collaboration has been better the last years. One main reason for this is the employment of former police officer in the oil company's security management apartment. This makes the security department automatically more aware of security and preparedness. Another reason is that the oil companies participate at the yearly Gemini exercise, where the numbers of oil companies that wants to participate has increases, and the police have to set some limits (Solhaug, Poilce, 2014).

Even if the police are in charge during a terrorist attack on petroleum facilities, the oil and gas companies are responsible of making emergency preparedness system and to prevent terror attacks. The oil and gas companies goes through preparedness plans related to terror with the police, and they also have a close dialogue with the police chiefs with shelf responsibility (Nielsen, ENI Norge, 2014).

If an oil company experience a terrorist attack on an oil platform the police and military are responsible for combating the attack "*the oil companies don't have the knowledge and resources to do that"*(Stabell, Statoil, 2014). But if a terrorist attack happens on a platform the oil companies has an important task through communicating and provide them with drawing and list of people present on the platform. Liaisons from the oil company can also assist the police due to technical aspect on the installation, where a liaison is obligated to meet, but not speak (Solhaug, Poilce, 2014).

4.2.3 Other actors and their preparedness responsibility

The Petroleum Safety Authority Norway (PSA) is an independent government regulator, responsible for the regulation of safety, security, emergency preparedness and the working environment in the petroleum industry. The PSA set the required standards, and the oil companies are responsible for achieving them (Australian Government, 2012). The PSA main task is to monitor the oil companies preparedness management systems and follow up how the oil companies manage to prepare for major hazards and crises (Lieungh, 2013).

PSA prioritize what is called functional regulations, where there are no clearly defined requirements but the oil companies need to find a way to ensure safety that works for their company. It is important to emphasise that PSA don't give advise to what the oil companies should do, since PSA then will be guilty if something happens. The oil companies have to follow rules and regulations and PSA will supervise if the companies documented solutions are satisfying. PSA are organized under the ministry of labour and social affairs that each year writes an award letter that defines the areas PSA should focus on. The new focus area in 2014 is to ensure safe operations in the Barents Sea (Larsen, PSA, 2014).

Usually The PSA gives a three weeks notice before the supervisory inspections and audits. The oil companies are the ones responsible for paying the costs of the supervisory inspections and audits. The PSA is entitled to give advises on specific required actions, intervene in the daily process and to determine or suggest what actions the oil companies should take (Australian Government, 2012).

The instrument PSA use during meetings, audits and verifications are dialog and if something is not good enough they have to take action. PSA was delegated authority for the Petroleum Act section 9.3, with responsibility for overseeing the oil industry in relation to intentional attacks (Larsen, PSA, 2014).

As a supervisor PSA have a good relationship with the oil companies and all inspections are notified (Larsen, PSA, 2014). The oil companies have both in the planning phase and during an accident close dialogue with PSA, where PSA can advise and assist the oil companies in different ways (Brusdal, Statoil, 2014). The oil companies and PSA has a shared goal: to ensure safest possible activities (Waldeland, Eni Norge, 2014).

Armed Forces Special Command (FSK) was established due to the increased risk of terrorist attack against Norwegian interest, including offshore oil platforms. The police chief who are responsible during a terrorist attack define the need for military support within the police framework. The practical part of this is regulated by the development assistance where the police chief sends a request for assistance to the Ministry of Justice through the Police Directorate. The Ministry of Justice consider, in consultation with the Police Directorate the request and the defence can then propose conditions to provide assistance. The special force cannot go into a police operation before there has been done a formal paper work, where the police chief sends a request for assistance. This is regulated by the constitution Article 99 in Norway, which state that the military forces shall not be used against civilians, a terrorist attack is an exception. This is regulated because Norway wants to have democratic political control over the military resources when it is used against civilian (Justis-og-beredskapsdepartementet, 2004).

After the 22th July there have been some changes in the aid instruction, to save time. Even if the chief must submit formal documents through the channels he shall notify the defence, so the time the politicians and ministries use to approve the documents the defence can use to gather forces and prepare for the situation (Solhaug, Poilce, 2014).

The Norwegian police security service (PST) is a separate police agency administratively to the Ministry of Justice. Their main task is to advise the police district during a crisis situation. The Norwegian police security service prepares threat assessment and provides advice on measures to safeguard Norwegian interest. The threat assessment is evaluated in consultation with the police directorate, and the police chief in the area decided which actions that should be taken (Politiet, 2011).The oil companies addresses the information provided by the Norwegian police security service on counter terrorism and terror threats (Participant 1&2, Statoil, 2014).

A new counter-terrorism centre is going to be established within the Norwegian Police Security service (PST) to strengthening the capacity and ability to share information about the terror threat. The Norwegian Intelligence Service (NIS) and the Norwegian Police Security Service (PST) collaborates on terrorism, PST is responsible for the national internal security and NIS is responsible for information about foreign states, organizations or individuals that is seen as a potential threat to the nation (Norwegian Directorate for Civil Protection, 2013).

The Norwegian Petroleum Directorate (NPD) is a specialist government directorate and administrative body that report to the Ministry of Petroleum and Energy. The main goal of NPD is to create and secure the greatest values for the society from oil and gas activities. This is done through efficient resource management in terms of safety, emergency preparedness and safeguarding the external environment. The Norwegian petroleum directorate are responsible for making recommendations to the Ministry of Petroleum and Energy on which companies that should be awarded licences, based on a comprehensive evaluation of the applicants (Oljedirektoratet, 2011).

The Ministry of Defence is responsible for forming and implementing the Norwegian security and defence policy. The Ministry of Defence provides courses each year with focus on national security and safety policy. Governmental, parliamentary and industry participate in these courses and the industry represents normally 40-50% of the participants. The Ministry of Defence regulates exercises with the police and ensure good coordination between military and police personnel (Australian Government 2012). Not all operations have both military and police personnel, but if this is the case they should not be mixed. E.g. there should never be one from the military force and two from the police force representing one team. It should be a separated mission between the police and the military force, where the Police force is responsible of one floor on the platform, while the military force are responsible of another. These two forces should never be mixed and each force has their own commander of chief (Solhaug, Poilce, 2014).

The main task of the Norwegian army, as one of the defence policy objectives in Norway, is to contribute to safeguard the Norwegian civilians by limit the consequences of accidents and attacks. The army provide assistance to the police in acute events such as terror, where they will help to prevent the damage on the country's population, infrastructure and social functions (Politiet, 2011).

The Directorate for Civil Protection (DSB) is a drive force to prevent accidents and to ensure efficient preparedness and crisis management. They have the overall coordination responsibility, especially coordination of activities, objects and organizations in case of terror attacks (Politiet, 2011).

The Joint Rescue Coordination Centre (JRCC) has an overall operational responsibility during search and rescue operations and has two main centre located in Bodø and Sola (near

Stavanger). The centre is controlled and managed between the government, voluntary organizations and private companies, with necessary resources. When an accident takes place the JRCC are notified and will help the oil companies with evacuation and injured people. JRCC is responsible for all resources on land, offshore and in the air and the main reason why the oil companies notify JRCC is their need of SAR helicopters (Waldeland, Eni Norge, 2014).

4.3 The Barents Sea: a complex and turbulent environment

The last 20 years have been marked by a rapid development in the Barents Sea due to increased oil and gas discoveries with opening of new areas for petroleum activity. The Norwegian government states that this development will strengthen the long-term foundation of the Norwegian wealth creation, and are therefore important to protect. One way of strengthening the security of these petroleum installations is to build a robust preparedness system (Norwegian Ministry of Foreign Affairs, 2011).

The Barents Sea is an exciting petroleum province creating diverse opportunities. The Arctic area is estimated to contain 13% of the world's undiscovered oil (*90 billion barrels of oil)* and 30% of its undiscovered gas (*1670 trillion cubic feet*). In 2013 The estimation prognoses by Rystad Energy states that the Arctic would provide 3% of the global petroleum in 2020 and 9% in 2035 (Fisher, 2013). Today there are three fields located in the Norwegian Barents Sea that is either under production or planning to start up in the nearest future. These are Goliat field, Snøhvit field and Johan Castberg field (earlier Skrugard and Havis) and new fields are expected to emerge the next years (Atle, 2013).

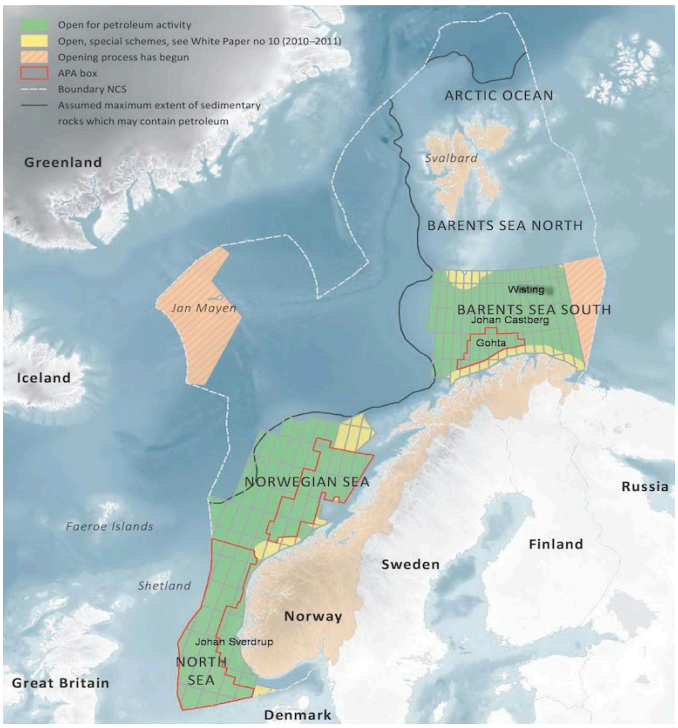

Figure 13 - Location of the Barents Sea, North Sea and Norwegian Sea (NPD, 2013)[1]

[1] http://www.npd.no/Global/Norsk/4-Kart/Sokkelkart2013/Sokkelkartet-2013.pdf

How the Barents Sea and the Arctic should be divided between Norway and Russia has not always been clear. After 40 years of boarder dispute the conflict was solved in 2010, and lead to the opening of oil exploration in the Barents Sea. The two countries signed a legal treaty dividing the arctic area equally between Russia's Kola Peninsula and the Norwegian coast (Fischer, 2011). Several Russian and international petroleum companies have shown interest in the Barents Sea, and fields are under exploration on the Russian side as well (Paaske, 2013).

The Arctic's resources have created a demand for new research for several countries. There are numbers of countries counting on exploration in the Arctic to strengthen their future energy security and shipping opportunities. Many of the actors wishing to operate in the Arctic works on improving the satellite data in the High North. Functional satellite data will contribute to improve the intelligence capacity in the Arctic region. Operators in the region needs to be aware of the increased activity from activists and where petroleum installations in the Barents Sea in the future will become potential intelligence activities. This regards also Norwegian scientific communities working on security within the High North (Alsen, 2013).

It is required that the response and preparedness in the Barents Sea should be at least as good as the rest of the NCS (Olje-og-energidepartementet, 2003-2004). This is challenging due to the areas complex and turbulent environment. Oil and gas operators in the Barents Sea need to deal with harsh weather conditions such as sea ice, icebergs, darkness, low temperatures, polar low, wind and visibility. These challenges are related to safety preparedness that requires protection of personnel, installations, equipment and material properties (Paaske, 2013). The main challenges related to security preparedness are the lack of infrastructure, facilities and resources (Henningsgård, 2013).

> *"Even though the same requirements are set for those operating in the Barents Sea it is highly more difficult to meet these requirements in a complex and turbulent environment"* (Larsen, PSA, 2014).

The Norwegian military force raise concerns related to the challenges of a potential terror attack on Norwegian offshore installations in the Barents Sea. A terror attack offshore in the Barents Sea is close to the maximal capacity of what the Norwegian police and military is capable of delivering. Each year they practice on attacks like this. It is necessary with assistant from the Norwegian military during a terror attack offshore, due to their competence

and expertise of handling terror attacks offshore. The Norwegian police are more specialised and trained to handle terror attacks onshore then offshore. While that is said the military lack competence on several areas related to the offshore installations technology and other relevant aspects, where they are dependent on the oil and gas companies and their competence (Taraldsen, 2013).

Large distances, few vessels and helicopters characterize the Barents Sea. The PSA is working on improving the preparedness system within the Barents Sea through emergency preparedness analyses and plans for activity. PSA will mainly focus on new regulations and the need for more rescue equipment. To meet these goal, collaboration between several parties are needed in the Barents Sea (Petroleumtilsynet, 2013 (2)).

> *"Collaboration is the key to successful preparedness within the Barents Sea"* (Petroleumtilsynet, 2013 (2)).

Obligatory and specific cooperation frameworks needs to be built between the operators and the governmental authorities to conduct safe and secure operations, work for common solutions and new systems to meet the challenges in the Barents Sea (Petroleumtilsynet, 2013).

The preparedness team handling crisis situations in the Barents Sea should be both flexible and innovative, and at the same time have clear responsibilities, roles and tasks (Borch, 2013). They are dependent on the right skills, knowledge and competence to secure the installations during a crisis situation. There is no right answer to how a preparedness team should organize and control their preparedness system, but they should be prepared for unexpected events and worst-case scenarios. Even though there is a low probability for extreme events such as terrorism, the consequences of these extreme events could be tremendous (Borch, 2013).

4.3.1 Infrastructure, installations and resources

Logistics is defined as "*the management of the flow of resources between a point of origin and the point of consumption*" (Henningsgård, 2013 p.12). One way of studying the Barents Sea preparedness logistics is to look at its infrastructure, facilities and resources (Henningsgård, 2013).

The preparedness resources in the Barents Sea are limited, and cannot be compared to any other parts of the NCS. This is mainly due to lack of infrastructure, the lack of activity in the area and large distances for the preparedness resources to reach the crisis situation offshore. There are many actors operating during a crisis situation that needs to be correlated and collaborate. The long distance to shore also creates challenges related to communication and satellite availability during a preparedness situation (Nielsen, ENI Norge, 2014). There is a lack of satellite communication, where there is no satellite capacity north of 75° and no geostationary satellite capacity north of 81,3° (Paaske, 2013).

PSA is highly focus on facing the logistics challenges in the Barents Sea through collaboration between the actors in the area. PTIL states *"solo games are out of the question when adapting to a new area, furthest north on the NCS"* (PTIL, 2014b). Lack of infrastructure, logistic solutions and access to resources during a crisis situation can lead to tremendous consequences (Okstad, 2012).

The Barents Sea boarders to the Finnmark County, an area characterized with large distances between its regions. This differs from other regions in Norway, that have regions and a preparedness system much closer located. The Municipality of Hammerfest is the main supporter related to the activities in the Barents Sea. Kirkenes also plays an important role and seeks to strengthening its role as an important petroleum base within the Barents Sea region (Jacobsen, 2012). In the future many locations along the coast will most likely become supply bases (Henningsgård, 2013).

The long distances between shore and the installations create longer respond time for emergency resources such as personnel, equipment, vessels and helicopters to reach a crisis situation offshore. These challenges leads to that the operating oil companies in the area needs to find new solutions to safeguard their preparedness system. The main challenges are related to helicopter capacity and emergency equipment (Larsen, PSA, 2014).

There are few available airports with proper capacity in the Barents Sea. These airports are important contributors to the flow of resources in the petroleum industry. The main resources available in the Barents Sea related to preparedness are helicopters, coast guard vessels and vessels operated by Norwegian Sea rescue. The Norwegian navy's coast guard vessels and Royal Norwegian Air Force may also assist helicopters and a search and rescue helicopter (AWSAR) may be sent from Hammerfest. The public rescue helicopter 330 Squadron has an

operation limit of 340 kilometres from shore, but some of the activity in the area is more then 450 kilometres from shore. There are no filling stations for helicopter in the Barents Sea, which is needed if the helicopters are going to operate over their limit, which will be the case in the northern parts of the Barents Sea (PTIL, 2014a). With few helicopter resources in the Barents Sea this makes the oil and gas companies more dependent on vessels. There are also a shortage of appropriately equipped vessels that may be called out for assistance during a terror attack (Ims, 2013). In addition helicopter can rescue people in almost any weather condition but the standby vessels will struggle more to meet this challenges (Ims, 2013). On the other hand there are vessels related to fisheries, naval activity, maritime tanker and bulk transport, cruise ships etc. located in the Barents Sea (Jacobsen, 2012).

There will be struggles to rescue, transport and provide medical treatment to 80-140 people working on an offshore installation in the Barents Sea (Jacobsen, 2012). Medical evacuation is difficult in the area due to the long distance from shore. It is required that the medical team in the petroleum industry gets the patient to a onshore hospital within three hours (PTIL, 2014a). There are hospitals in Hammerfest and Kirkenes and The University Hospital of Tromsø is also available, but is located 200km from Hammerfest (Ims, 2013). The challenges related to medical assistance could be solved with a even more robust medical team located on the oil platform, but also with more medical capacity onshore is needed (PTIL, 2014a).

Those who know the region are familiar with the challenges related to the lack of capacity and available resources. It is larger distances between the operators in the Barents Sea are, due to the lack of activity. The activities in the area are expected to increase in the years to come (Jacobsen, 2012).

> *"Collaboration with other companies, partners, external suppliers and the authority is important for the oil companies facing terror threat in the Barents Sea. A terror attack is a turbulent and difficult situation to handle, especially in the Barents Sea, and requires collaboration of resources between all the actors if a situation occurs"* (Participant 1&2, Statoil, 2014).

The long distances between the installations and lack of resources compared to the rest of NCS makes the petroleum companies more dependent on resource allocation and information sharing. Many companies are now teaming up, but again there are challenges when there are

limited numbers of resources, if several crises or accidents take place at the same time (Skog, Acona, 2014).

Oil and gas companies operating in the Barents Sea have their 2nd line preparedness team located at their main offices in Norway. ENI Norge AS has worked out a plan on how they are going to build a supportive 2nd preparedness team in Hammerfest. There are mainly 3 preparedness roles that are going to be located here: next of kin role, environmental liaison role and role with local knowledge. In addition there is also a regional guard. These supportive roles are not specifically aimed for the Barents Sea, but work more as a standard procedure when entering new areas regardless if it is in Kristiansund or Hammerfest. Organizational preparedness in general is not changed moving further north on the NCS (Waldeland, Eni Norge, 2014). Statoil operates in the same way. They have established a preparedness team in Harstad that functions as a support line to their 2nd line preparedness team in Bergen. It is required that the 2nd line support team has extensive local knowledge about the Barents Sea and its environment (Stabell, Statoil, 2014).

> *"There are fewer preparedness team members located in the northern part of Norway. This creates communication and collaboration challenges, and if a terrorist attack takes place on an offshore oil installation in the Barents Sea there would be less support and help from supply vessels and personnel working on other installations compared to a crisis further south on the NCS"* (Solhaug, Police, 2014).

The preparedness system located in Stavanger and Bergen are based on the infrastructure, resources and installations in the North Sea and Norwegian Sea. In these waters installations are closely located, with plenty of resources nearby such as support vessels, supply vessels, transport network and helicopters. The North Sea is a small geographic area compared to the Barents Sea, in addition the activity level is huge compared to the Barents Sea. Comparing the knowledge about the North Sea shows that the companies have little preparedness experience from the Barents Sea (Andersen, 2014). The helicopter resources in the Barents Sea are lower then in the south mainly due to the geographical differences (Rødal, 2012).

There is a need for evaluation of the preparedness resources that are present in Barents Sea related to the increased activity and responsibility. This requires a strong collaboration and interaction between operators, authorities and local participants (Borch, 2013).

4.4 Terrorism: a sharp, fragmented and unclear threat situation

Terrorism is defined as intentional act damaging or destroying technical, organizational, or social systems and human lives. Examples of intentional acts are bombing, kidnapping, cyber attacks, terrorist attacks and manipulation (Mitroff, 2005). *"We define intentional acts as when someone on purpose try to or succeed to harm personnel, damage our assets and/or our organization"* (Nielsen, ENI Norge, 2014).

> *"Terror attacks can really happen, they have happened to Statoil and it is highly relevant for our organization"* (Stabell, Statoil, 2014).

Terrorism often has international ramifications, but the terror attack on Utøya the 22 of July 2011 shows that terror can hit Norway, by a Norwegian, based on Norwegian relations. The terror threat situation in Norway is affected by development trends both in Norway and globally (Justis og beredskapsdepartementet, 2013 (4)). Norway has been spared for more incidents and attacks that other countries. These countries have easier built a culture and a greater understanding of the potential threat facing their nation (Participant 1&2, Statoil, 2014).

"The terror threat against Norway is considered to have aggravated" (PST, 2014 p.2)

The development trend illustrates a sharp, fragmented and unclear threat situation. Today extremist Islamic ideology is considered the highest terror threat against Norway. Other threatening ideologists in Norway are hostility to Islam, Right wing and Left wing extremists. This is mainly due to the increased political extremism and violent activities in Europe. There are little that indicates that these ambitions will create terror attacks across national borders, and this threat has still not jet affected Norway (Norwegian Directorate for Civil Protection, 2013).

4.4.1 The Norwegian terror threat picture

Norway's prosperity and welfare are dependent on export from the oil and gas industry. Oil and gas installations in Norway are particular important for the country to develop a steady economic growth. This makes the oil installations both onshore and offshore a potential terrorist target, due to the strategic value of the industry for Norway and countries that relies on their import (Ulriksen, 2013).

The offshore oil and gas industry has developed rapidly in the recent years due to increased energy demand and energy security. This has made oil and gas installations offshore more vulnerable to terrorism attacks due to their economical importance. The petroleum companies are more aware of the threat in the society, where they have increased their efforts on strengthening their preparedness system (Kashubsky, 2013).

> *"We have always had procedures on how to deal with terror situations offshore in Statoil, but the focus has changes extremely in the last few years due to events like 22 July and In Amenas. In Amenas has been extremely helpful for us, where we got criticism on security areas that we were not aware of before. After the In Amenas attack we have done many improvements within our management system, internal requirements and security analysis"* (Brusdal, Statoil, 2014).

Statoil has increased their security workforce acquiring security personnel working primarily within each business area. Increased security awareness within the organization is essential. The employee's attitude towards security risk should be that "*all employees have a responsibility to secure safety*". The organization needs to become more united creating common organizational systems and frameworks (Midttun, 2013).

The Norwegian police security service (PST) analysis the annual threat picture and expected developments, where they focus on factors that may affect Norway's security. The most important area they assessed for 2014 is to prevent people with close connection to Norway to be involved in terrorism attacks. Due to rapid changes in the society there are uncertainties related to the development trends. To reduce this uncertainty PST has chosen to only focus on the general trends in the threat picture and not single events that can affect the picture on some areas (PST, 2014).

The main purpose of the PST annual threat assessment is to increase the awareness and understanding of development trends related to the national terror threat picture. The assessment is mainly aimed at national decisions makers that are responsible of the policies or facilities related to PST's responsibility area. The main actors are political leaders, departments related to PST's responsibility area, central management bodies within the Norwegian Police and military, and key players in the Norwegian business sector (PST, 2013). PST also provides consulting within security quality within critical social functions and infrastructure, both for the public and private sector. E.g. PST cooperates with the oil and

energy sector. Different businesses and sectors need different type of assistant, where they all have specific challenges and conditions that affect the security. PST assess social consequences of single events related to each sector, taking into consideration both Norwegian International threats (PST, 2013).

Petroleum companies are dependent on PST's threat assessment, but they also have established own systems in order to gather information about the terror threat picture (Participant 1&2, Statoil, 2014).

> *"We have close dialogue with PST and their threat assessments where we will be notified if there are any increase of terror threats against oil and gas installations"* (Brusdal, Statoil, 2014).

In addition oil companies use earlier experiences and accidents to evaluate what development and trends that are influencing the threat picture against their oil and gas installations:

> *"PST's threat assessment is only one source of information. We also buy information from other external source. Our threat assessment is therefore based on information from the authorities, external sources and own information. PST is still the primary source and we have close cooperation"* (Participant 1&2, Statoil, 2014).

There are disagreements on the security of oil and gas installations in Norway related to how strong the security should be and how often it should be updated. The Norwegian Ministry of Petroleum and energy (OED) concludes that there is no need for a better security protection of oil and gas installations in Norway. Further OED states that that nothing points in the direction where petroleum installations are sensitive terror targets (Helgesen, 2013). The PST, the national security authority (NSM) and The Norwegian Intelligence Service (NIS) strongly disagree. Siri Meling from the **Norwegian Conservative Party** states in an interview with the newspaper Aftenblandet in 2013 that, *"I think this is a surprising conclusion, and it seems naive to think that petroleum installations are not highly vulnerable terror targets"*. Oil as a product has a strong symbolic effect, and those working on the platforms are highly vulnerable to terror threats. In the threat evaluation from 2013 NSM, PST and NIS states that the oil and gas sector is an attractive terror target where terrorists seek goals that represents symbolic value (Lewis, 2013b).

Although there are disagreements on the threat vulnerability of oil and gas installations, the PST has presented some trends and developments in the society that affects the terror threat level in Norway. This is highly dependent on the terrorist's capacity and intention (PST, 2014).

The world experiences economical turbulence with an on going economic crisis affecting a number of European countries, creating ripple effects in several areas. Increased unemployment and poverty in countries can lead to increased feeling of hopelessness and where people are more open to propaganda from different political directions. The recruitment to extreme environments has increased in several European countries and it can increase the motivation and capacity to commit terrorist attacks. So far we have not seen these effects of the economic crisis in Norway (Justis og beredskapsdepartementet, 2013 (1)).

In areas such as Afghanistan, Pakistan, Yemen and the Sahelt belt, have weak authority control and extreme groups quickly are established (Justis og beredskapsdepartementet, 2013 (1)).

Travel activities have become more organized and it has become easier for terrorists to travel abroad to receive ideological training, battle experience and expand their network (Justis og beredskapsdepartementet, 2013 (1)).

The rapid technological development and globalization have made the challenges related to terrorism more complex. Due to Internet and digital networks it has become easier to support extreme Islam groups and to perform activities in better and more efficient ways. The globalization has made Norway more visible internationally through new communication networks. Today political debates, standpoints and initiates that are promoted one place in the world can easily spread to other parts of the world (Norwegian Directorate for Civil Protection, 2013).

Radicalization is the process in which a person increasingly accepts the use of violence to achieve its political goals. Radicalization can happen with all types of beliefs, political agendas and ideologies. In Norway there has been an increasing trend of young Norwegian citizens supporting extreme and violent ideologies. Many of these have a polarized worldview and are often easily affected. Other seek belonging within extreme environments where they feel accepted (Justis og beredskapsdepartementet, 2013 (1)).

> *"It is difficult to say how the terror picture will develop in the future since it depends on a combination of political situations and developments in the society. The less integrated people are in the society the more increased are the likelihood of extreme events. In addition the development against young people with mental disorders affects the threat picture"* (Nielsen, ENI Norge, 2014).
>
> *"The PST rapport states that the biggest threat is Islamic terrorists coming back from Syria after practicing on terror and war attacks"* (Jerre, DNV-GL, 2014).

It is naive to believe that terror attacks will not happen in Norway, but it is difficult to protect us against these attacks. Often only one person with intentions and capacity is needed to perform a terror attack. It is much easier to implement good security procedures when the threat level is high, rather than when you don't see any threats at all" (Participant 1&2, Statoil, 2014).

4.4.2 Terror threats against oil and gas installations

Oil and gas platform in the Barents Sea is facing a variety of threats related to intentional attacks. Terror threats against petroleum installations can be everything from bomb threats, taking hostages, activism, sabotage, theft of valuable or sensitive information as industrial espionage or cyber attack or breaking into the control room where the organization loose control of IT systems (Jerre, DNV-GL, 2014) (Nielsen, ENI Norge, 2014). If a terrorist gets access and control of the IT system controlling oil and gas installations, the terrorists can do great harm (Nielsen, ENI Norge, 2014). Terror attacks can take form in endlessly ways, from small to large attacks, to coordinated and non-coordinated attacks (Brusdal, Statoil, 2014). Terrorists tend to coordinate multiple raids of attacks, where the diversionary attack is designed to divert the attention of the larger attack. The preparedness management will then use longer time to respond and the terrorists will get the chance to do even more harm (Wu, 2009). *"Terrorist attacks can easily take place at several installations at once, creating even more uncertainty"* (Nielsen, ENI Norge, 2014).

There is a distinguish between external and internal threats:

Internal threats are threats from within the organization, such as employees or other profiles taking part in the daily processes. These people have access to resources, information,

systems and procedures. Typically these people will be authorized individuals that have easy access to sensitive information and highly knowledge about the organization (Cutler, 2013).

> *"Internal threats could be a terrorist infiltrated in our organization. It is more likely that terrorist tries to become a part of the organization then approaching from the outside at offshore installations located in a harsh environment. I will be much more afraid of a terrorist internally in our company, since this is a person with technical competence and has the ability to do major damages within a limited amount of time without weapons or equipment"* (Nielsen, ENI Norge, 2014).

> *"Terrorists may use several years building up their competence. The terrorist can be someone who has worked in our company for 10 years, with high knowledge and experience within the company. Then you will have highly competent people that can do great harm to the organization"* (Brusdal, Statoil, 2014).

External threats will be people that are not part of the organization or belong to any group that has any direct relation with the organization, but still has a goal of targeting the organization (Cutler, 2013).

> *"External threats are typically terrorists that attacks the platform from the outside and takes partially or fully control of the platform. External threats can also be people with political or religious beliefs and in some cases with a mental disorder which I would say is highly correlated"* (Nielsen, ENI Norge, 2014).

Greenpeace has several times through peaceful demonstrations shown how easy it is to enter oil and gas installations. Statoil has experienced actions from Greenpeace dressing up as polar bears and boarding one of their rigs. The OIM took them on board, drank coffee with them and explained them about their activities and thereafter brought them to shore. Statoil do not have an aggressive approach for removing activists, but rather remove them in a peaceful way (Brusdal, Statoil, 2014). ENI Norge has also had experience with Greenpeace trying to do a campaign on Esperance where they did some test drilling. They solved the situation by disconnecting, move the rig and hide close to Snøhvit for a day. This was to avoid the publicity and attention from the media. ENI has a clear policy related to non-governmental organisations such as Bellona and Greenpeace. They will not act aggressive and rather invite the activists on board and document the situation with surveillance cameras. They have

people in their organisation that are trained to handle such situations (Nielsen, ENI Norge, 2014).

> *Environmental activists do not have intentions of harming people. Often they only seek publicity, while a terrorists wish to create fear through disturbing ways. I am personally much more afraid of a terrorist attack then a Greenpeace action"* (Waldeland, Eni Norge, 2014).

Environmental activist has also boarded the Russian Barents Sea. Greenpeace activists and two journalists sailed on the organizations icebreaker, *Arctic Sunrise*, on the 28th of September 2013, boarding Russia's Prorazlomnoye oilrig in the Pechora Sea. They were arrested, but shortly after they were released in December. After the first exports of oil, President Vladimir Putin signed into law on act *"the establishment of departmental security to ensure the safety of the fuel and energy complex".* This law allows corporations to establish their own private security forces to defend their infrastructure. Putin has also discussed with the Russian Security Council, on how to strengthen Russia in the Arctic. He urges the importance of protecting oil and gas facilities, loading terminals and pipelines from terrorists and other potential threats. One of the Greenpeace activists sees this only as the beginning. Oil companies are moving further north; climate changes are taking place and new challenges arise. Putin's increased security forces on oil and gas installations in the Arctic create a whole new perspective on the Arctic energy race (Bennett, 2014).

4.4.3 Risk Assessment

"Black Swan" is a concept used to describe unpredictable accidents with major consequences. Risk-analyses are techniques used to identify and define preventive measure to prevent accidents from happening. Traditional risk-analyses are not able to capture unpredictable events, such as terror attacks, due to high complexity and uncertainty. Organizations facing the threat of terror need to build a complex security system with the right competence, strong management and interplay between the people and systems (Dahle, 2013).

Assessments of different terror scenarios are a key element to maintain a high security level offshore (Parfomak, 2007). On the 22nd of July at Utøya no one could estimate the probability of the attack and how it would happen. Security assessments should be based on the consequences of an attack and how well the prevention barriers function, rather than the

probability of an attack taking place. The security risk assessment should rather assess the vulnerability assuming the attack will take place and then assess how prepared the organization is to meet the attacks (Jerre, DNV-GL, 2014).

> *"A terrorist attack can not be calculated in the same way as other potential threats because of its dynamic situation. It is difficult to say if the probability of a terror attack on an oil platform is low or high. It is a misjudgement to say that the probability is low, just as there is a misjudgement to say that the probability is high. Oil companies are capable of making risk-analysis estimating if the risk of a terror attack is high or low, but then something happens that changes the situation completely"* (Nielsen, ENI Norge, 2014).

There are several scenarios and ways terrorists can attack. Through a risk assessment it is possible for the oil and gas organizations to evaluate the probability of a barrier failure and the impact or effect of an attack. The threat level of the terrorist is based on its intention and capacity to perform the attack. Based on this statement some scenarios have a higher risk than others. Those scenarios with a high risk will be marked with red in the risk matrix bellow, assuming that these scenarios have a higher risk than other scenarios marked with yellow (medium risk) and green (low risk) (Jerre, DNV-GL, 2014).

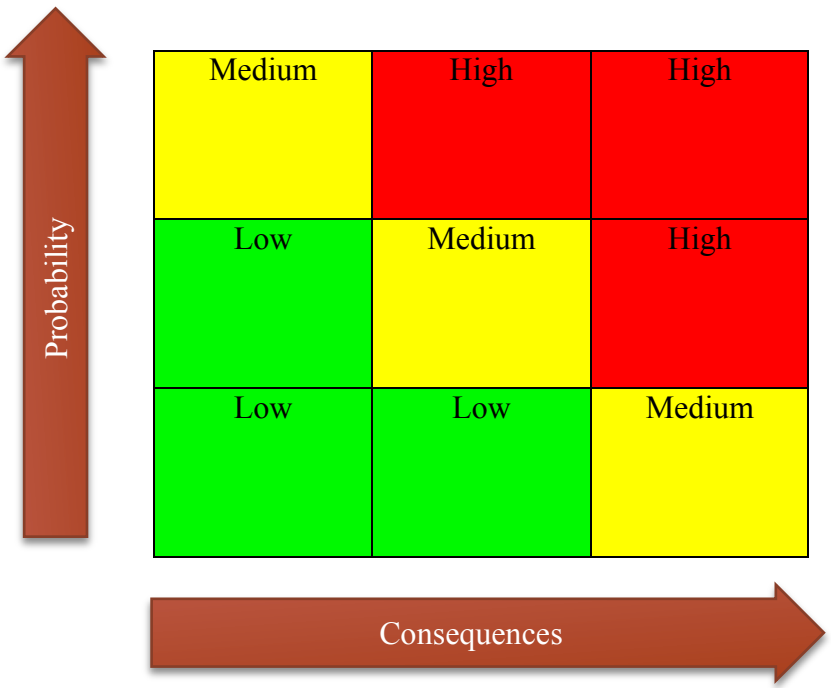

Figure 14 - Risk matrix: the probability and consequences of different terror threats (Jerre, DNV-GL, 2014)

Oil and gas organizations also measure the terror risk related to what barriers that are in place and how well they protect against potential terror threats. When the barrier evaluation is done, the organization needs to make a security plan for each oil and gas installation describing specifically what terror threats each installation is facing and the security controls that are in place (Jerre, DNV-GL, 2014).

Barriers are set up by the oil companies to prevent incidents such as terror attacks. Prevention barriers can be anything from technical barriers, procedures, training, plans, and inspections and employees awareness. Barriers are also set increasing and improving the terror awareness among the employees and personnel. Terror awareness works on early warning signals to prevent the event from escalating. Petroleum companies have four types of barriers in place prevent the attack from initiating, detect the attack early enough, delay the attackers in their progress and how to respond to the attack (Jerre, DNV-GL, 2014).

4.4.4 Security culture

Organizations have problems understanding how intentional acts can take place and where many sees these threats as *"this will not happen to us"* (Mitroff, 2005).

> *"The threat of terrorism in Norway are relatively low compared to other countries, but this does not mean it cannot happen. The consequences if it happens are often huge especially in the petroleum industry. We need to mitigate the risks of terrorism through strengthening our organization culture on security"* (Participant 1&2, Statoil, 2014).

Statoil has lifted its security management and workforce after the In Amenas terror attack. This should not be on the expense of the work within health, safety and environment (HSE). Increased security awareness within the organization is essential. The organization needs to become more united through common organizational systems and frameworks, strong management systems, clear definitions of requirement, the right competence and capacity within security (Midttun, 2013).

> *"We work mainly to build a security culture where all of our employees will report back to the office if something suspicious emerge. 20,000 employees working for the same cause, having eyes and ears open, reporting back to the office is defines as really*

> *good security preparedness. This is not done over nigh and something we further have to work on"* (Participant 1&2, Statoil, 2014).

Norway is a naive nation and always thinks the best about others compared to the U.S where you are a criminal until the opposite is proven (Stabell, Statoil, 2014). Statoil admit that they have been perhaps a little bit naive and see improvements area within security. Today several measures and actions are done in the security field, but Statoil wants to do more (Participant 1&2, Statoil, 2014).

"Background checks are done on everyone hired"(Stabell, Statoil, 2014).

More focus has been given to background checks of new personnel, suppliers and other collaboration partners. Oil companies operate in an international industry and it is important to be aware of who you communicate with internal and external. Access to offices, buildings and installations in general has been strengthening. Changes have been done related to general routines such as: memory sticks by external actors are not allowed to be connected to the organizations computer system, stricter identification systems before allowing access, stricter follow up of visitors, and more awareness in general of information sharing specially in public places. All of these changes are small steps towards a better security organization culture (Stabell, Statoil, 2014).

UK is one of the largest producers of offshore oil and gas in the world, and the government has made several changes in their security policy after accidents such as the Piper Alpha explosions that killed 167 people (Australian Government, 2012). In England, Essington, have a strong physical security around their platforms and installations, with possibility of being armed. Norway are not the same level of physical security. The security in Norway rather focuses on seeing the signals and the prevention phase before the attack occurs. If there are terrorist who really want to attack they will most likely succeed (Jerre, DNV-GL, 2014)

One of the biggest challenges in Norway is that we have been spared for a lot of incidents and attacks compared to other countries, which has made them more able to build a culture and an understanding of different measures. If you compare security in the oil and gas sector in UK and Norway they are completely different. They have experiences actual events, which has made them realise how necessary it is to focus on protection. Norway is not at the same level related to understanding the importance of security (Participant 1&2, Statoil, 2014).

Summary

In this chapter we have presented our empirical findings. The chapter is divided in four parts presenting the oil companies preparedness system, the national preparedness system, the Barents Sea and terrorism. The empirical findings are a combination of secondary and primary data. The primary data presented is from interviews with participants from the authority and the industry. The secondary data is primary from books, article and journals. The empirical data will be analyses further linked up to the theoretical framework in analysis chapter. The main finding in this chapter is summed up here in four sections.

The oil companies preparedness system is divided into three teams, that all has to cooperate during a crisis situation. The 1st line preparedness team is present at the accident place; the 2nd line preparedness is a support for the 1st line and the 3rd line assure the quality of the 2nd line assistance. Most of the larger oil companies have an in house preparedness organization, but they still outsource some parts of the preparedness team to external actors. The oil companies have both internal exercises with the different preparedness lines and external exercises where they invite other actors to participate such as the police, military and other preparedness actors.

The Norwegian preparedness system is an integrated system with several actors, divided into four managerial levels. The Norwegian Government is responsible for handling a crisis situation such as terrorist attack, each Ministry has their own preparedness plan and training to handle crisis situations within their area of responsibility, the National Police Directorate, is the superior authority for the police districts and special agencies and the police are responsible of preventing and combating terrorism. Several other actors also have preparedness responsibilities such as PSA, the military, PST and the ministry of defence.

The Barents Sea is a complex and turbulent environment where it is required that the response and preparedness in the Barents Sea should be at least as good as the rest of the NCS. The main challenges related to security preparedness are the lack of infrastructure, facilities and resources. Large distances and few vessels and helicopters also characterize the Barents Sea area. Obligatory and specific cooperation frameworks need to be built between the operators and the governmental authorities to conduct safe and secure operations, working for common solutions and systems to meet the Barents challenges. The preparedness team handling crisis

situations in the Barents Sea should be both flexible and innovative, and at the same time have clear responsibilities, roles and tasks.

Terrorism is a sharp, fragmented and unclear threat situation. Oil and gas installations offshore are more vulnerable to terrorism attacks due to their economical importance. It is naive to believe that terror attacks will not happen in Norway, but it is difficult to protect against these attacks. Oil and gas platform in the Barents Sea is facing a variety of threats related to intentional attacks. Terror attacks can take form in endlessly ways, from small to large attacks, and from coordinated to non-coordinated attacks. There are several scenarios and ways terrorists can attack. Through a risk assessment it is possible for the oil and gas organizations to evaluate the probability of a barrier failure and the impact or effect of an attack. The threat level of the terrorist is based on its intention and capacity to perform the attack. There is a need for a change in today's security culture for the companies to be able to face the new terror threats.

5.0 Data Analysis

This chapter focuses on the data analysis from the primary and secondary data. All the secondary and primary data are presented in the empirical data chapter. The theory and the empirical findings lay the foundation when analysing how the managerial roles within the oil companies preparedness system needs be strengthen when moving into a more complex and turbulent environment facing the threat of terror attacks on offshore installations.

The research question in this study is:

> *"How to strengthen the managerial roles within the 2nd preparedness team against terror threats in the Barents Sea?"*

In order to answer this problem statement, the following sub-questions has been analysed and answered:

1. How can the managerial roles within the 2nd preparedness team be strengthened to prepare for terror attacks in the Barents Sea?
2. What measures should the national preparedness system implement to strengthen the 2nd line preparedness teams ability to prepare for terror threats in the Barents Sea?
3. What are the main preparedness challenges in the Barents Sea that needs to be solved for the 2nd line preparedness team to handle terror threats?
4. What measures should the oil companies and their 2nd line preparedness team implement to prepare for terror threats in the Barents Sea?

These questions are based on the data collected throughout the research project, both primary and secondary, and the analysis findings have been derived from these questions. Additionally, these questions helped identify the theories being used in the study

5.1 Oil companies preparedness system and the preparedness team

The oil companies are responsible for establishing an effective preparedness system to handle every hazards and accidents that might occur, regulated by the Petroleum Act. The oil companies structure their preparedness system in different ways, but all of them have a basic structure of a 1st line, 2nd line and 3rd line preparedness team.

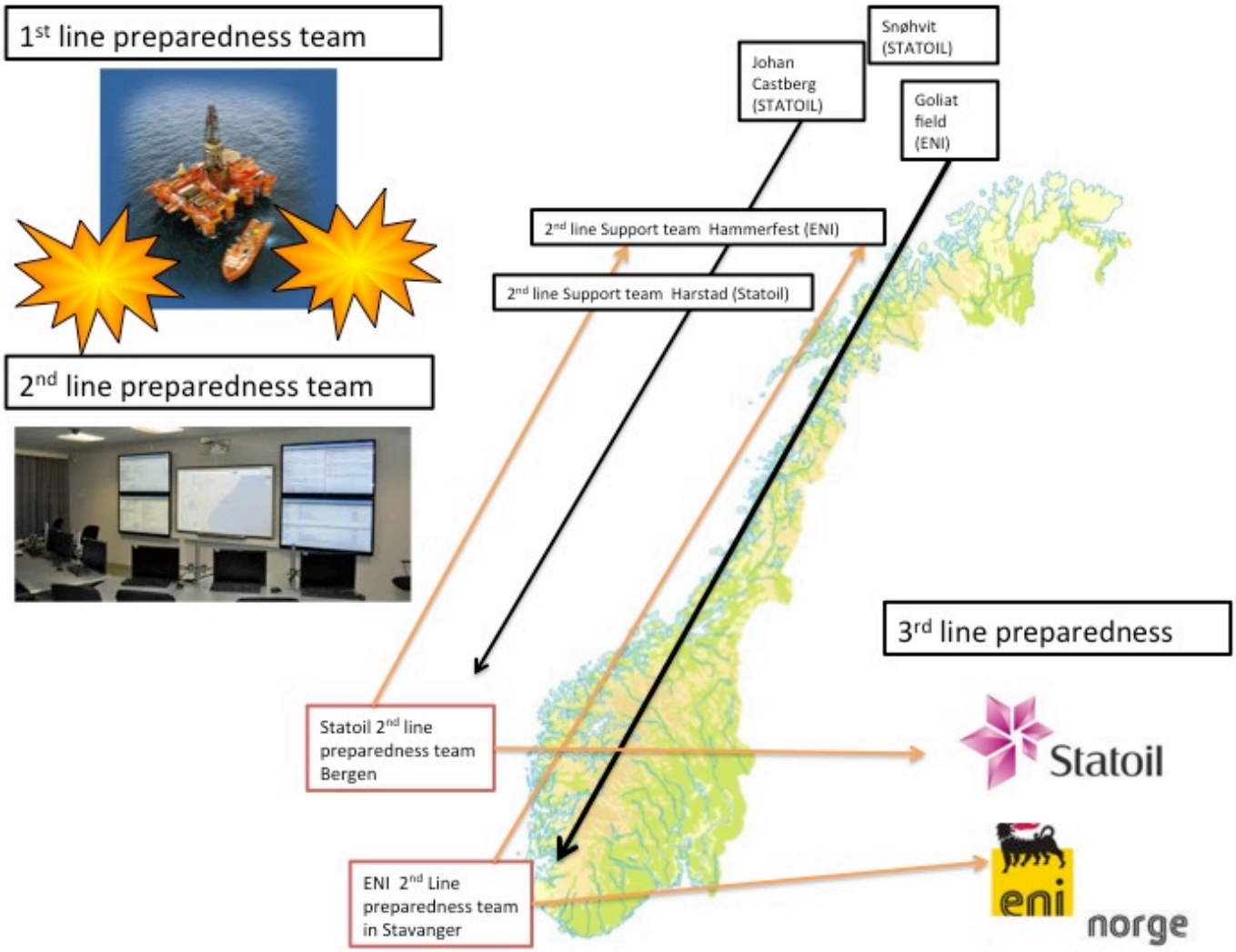

Figure 15 - The relationship between 1st, 2nd and 3rd line preparedness team

The size of a team depends on the complexity and extent of the organization it operates within. If the team becomes too large it can contribute to problems with information sharing and coordination (Aarset, 2014a). The oil companies preparedness system consists of three preparedness teams that are all linked to several other participants also referred to as support lines. The whole system is complex with many actors involved. During a terrorist attack

additional actors will be involved such as the police, the military force and other forces trained to combat terrorism.

The larger oil companies in Norway have in-house preparedness teams, but sometimes they choose to outsource parts of their 2nd line preparedness team to external preparedness actors such as Acona. There are both advantages and disadvantages with outsourcing roles and responsibilities in the preparedness team. The preparedness team consists of several roles with large responsibilities making it difficult to handle all the preparedness processes themselves. One way of releasing some of the responsibility can be done through outsourcing, where the external actor takes over some of the preparedness areas. Even though this releases some of the responsibility it creates more roles involved in the preparedness process. Through outsourcing some of the roles and responsibilities there are more actors depending on information to understand the situation and to be able to perform their task. By outsourcing some roles the 2nd preparedness team will be located in two locations, where a new role takes form responsible of sharing information and communicating across the two 2nd line teams. Having the 2nd preparedness team gathered at one place in the same room will create less confusion and misunderstandings. There are some roles and responsibilities that are easier to outsource than others. It is easier to outsource responsibility areas that do not influence directly the crisis situation offshore. One responsibility area several oil companies choose to outsource is the next of kin, which involves the contacting, and informing relatives of personnel involved in the crisis situation offshore. As long as the oil companies are able to give information and communicate in an efficient way, outsourcing will help the preparedness team to focus on those roles necessary to handle the crisis situation offshore. This is reflected through Mintzberg's (1989) managerial role theory stating that it is difficult for a manager to simultaneously give equal attention to all roles.

By outsourcing some of the responsibility areas the managers are able to concentrate and give more attention to the remaining roles. For the information sharing and collaboration process between the oil company and the outsourcing actor to be successful, the two should practice and train together on crisis situations. Through training they will be prepared to handle crisis situations together as a team, rather than two individual preparedness teams. It is important to not underestimate the importance of training, where earlier events show the importance of practice increasing the awareness of roles and responsibility during a crisis situation. The managerial role theory by Mintzberg's (1989) states that several actors cannot share the same

role and responsibility if they are not able to act as one unit. To be able to act as one unit during a crisis situation all actors need to conduct exercises together. These exercises are based on DSHA scenarios, where the threat of terror represents one of them.

There are different ways for the preparedness team to perform exercises and training on terror threat situations. The oil companies are good at performing exercises internally within the preparedness organization, including all three preparedness teams. They also perform exercises individually for each preparedness team, on the platform for the 1st line, in the preparedness room 2nd line, and strategically on the 3rd line. Moving into more complex environments with lack of resources and infrastructure the importance of exercises including all participants during a crisis situation becomes highly vital. The main preparedness actors during a terror situation offshore would be the police, the military, standby installations, the cost guard and other external actors. The preparedness teams have more exercises within tabletop and functional exercises, while there should be an increased focus on full-scale exercises including more preparedness actors. A full-scale exercise are close to a real crisis situation where the location, resources and personnel is the same during the exercises as in a real situation (Bråten, 2013). By conducting more full-scale exercises the preparedness team are able to test several parts of their preparedness plan, and more players are being tested simultaneously. There are lack of requirements from the government stating that the oil companies needs to conduct full-scale exercises on a high level to handle complex environment facing unpredictable crisis situations. Oil companies should increase the amount of full-scale exercises performed to test how their preparedness system works in all types of potential crisis environments These exercises are designed to challenge the entire preparedness system, including all participants, in a stressful and dynamic crisis situation.

Practise and training related to terror attacks are prioritized on the same level as other DSHA such as fire, man over board, helicopter accident, collusion danger, injury or illness of personnel. During a terror threat situation several more resources and participants are needed to handle the situation, requiring a much more comprehensive and complex preparedness system. The terror attack on an oil platform can take place in different ways requiring that the preparedness needs to prepare for different terror attacks scenarios (Johansen, 1994). Due to the complexity of a terrorist attack, compared to other DSHA, we suggest that threat situations like these are given more practice in addition to the once already performed.

Oil companies operating on the NCS should learn from those countries that have high experience from terror attacks. The petroleum companies should also learn from each other related to own terrorism experience. In this case Statoil is a major operator on the NCS who has experienced a terror attack In Amenas. This attack has affected their organization and strengthened their security so much that other petroleum companies have take benefit and learnt from their experience. Today there are collaboration between the oil companies where they share experiences and knowledge related to security through networking. To strengthen this collaboration and knowledge sharing process oil companies should conduct more common exercises and training within terrorism. Terrorist attacks require response from several actors to solve the situation. We see a lack of exercises related to terror, between the oil companies, which we believe is necessary to be able to assist each other during a crisis situation. The oil companies can benefit from common exercises both in terms of learning but also related to resource sharing. Resource collaboration during a crisis situation is necessary and could be anything from personnel, helicopter services, equipment and communication lines. The allocation of resources between the oil companies depends on the situation, what resources that are available and needed. To utilize these resources in the best way are highly dependent on the communication and information sharing between the oil companies (Njå, 1998). Today we see no evidence that these types of exercises do occur, and we believe this should be done at least once a year.

Summary

The preparedness system consists of three preparedness teams, and their interaction with dependent participants during crisis situations. It is a highly complex system where we recommend that the roles, such as media handling and next of kin that are not directly impacting the offshore crisis, should be outsourced to external preparedness actors. The roles in the preparedness team can then focus more on how to handle the offshore situation, whit less responsibility areas to relate to.

The oil companies perform both exercises individually for each team and common exercises for the whole system. Handling threat situations involving a high level of resources and participant requires a lot more training with other preparedness actors and oil companies than performed today. Oil companies should increase the amount of full-scale exercises to test entire preparedness system, including all participants, in a stressful and dynamic crisis situation.

The terror attack on an oil platform can take place in different ways requiring that the preparedness needs to prepare for different terror attacks scenarios The oil companies should focus more on practice and training due to terrorism, compared to other DSHA, due to its complexity.

The oil companies should strengthen their cooperation and knowledge sharing related to terrorism. To strengthen this collaboration and knowledge sharing process oil companies should conduct more common exercises and training within terrorism. To be able to share resources and assist each other during an attack on a platform, it is vital that they need to communicate more and share information.

5.2 The national preparedness system and the preparedness team

The Norwegian preparedness system is established to assist oil companies during crisis situations, involving several institutions and actors. These participants and the oil company need to coordinate the information and the resources to manage a crisis situation. They are given specific roles and responsibility between these participants. The Norwegian preparedness system is divided into four levels: political, strategic, operative and tactical. The Norwegian government represent the political level, the ministries represent the strategic level, while the police directorate represent the operative level, and the police districts represent the tactical level.

The performance-based model gives a clear split of responsibilities, where the authority is responsible for setting goals and acceptance criteria's. The oil companies are responsible to make sure that the performance goals are met. A Performance-based model is usually used by the authorities because they want to minimize their own risk and liability (Tørstad, 2010). The oil companies are responsible of securing the oil installations and if a crisis situation occurs all the responsibility and risk will lie on their shoulders. We have seen that oil companies tend to set stricter requirements related to security than the authorities. One reason for this might be that the oil companies have experience within terror and its potential threats, where they see a higher risk threat picture than the authorities. If the oil companies are not prepared for terror attacks they stand responsible for the losses related to human lives, economical losses, facilities damages, damage to the environment and reputation. To minimize these risks the petroleum companies have taken actions to set stricter requirements. The oil companies and their preparedness team need to collaborate with the authorities to set more realistic and common requirements in relation to combat terrorism.

The Norwegian practice related to security is still on the preventing phase, with an aim to build a strong system to prevent terrorist attack from occurring. Other countries that have experiences in terrorist attacks, several times, have worked on building a strong physical security of their installations. These countries are on a totally different level related to security than oil companies operating on the NCS. The closest the Norwegian oil companies get to physical security is the requirement of the 500 meters safety zones surrounding the installations. In Scotland the police protects the most important oil installations with armed people around the oil installations. The onshore plants are protected with fences and guards that are trained to deal with terror attacks. As the security onshore has been tighten, since the

attack InAmneas and the 22nd of July offshore targets are likely to be more vulnerable. To increase awareness and the threat related to terrorism, the Norwegian preparedness system should increase the physical security of oil installations on the NCS. Security solutions such as sensors and access control system will add extra layers to attack an offshore installation. Prevention barriers can be anything from technical barriers, procedures, training, plans, and inspections and employees awareness (Jerre, DNV-GL, 2014). Physical security can be done in a number of ways by either protecting the installation with a boom or to have ladders that can be pulled up to prevent the attackers to board the offshore installation. The helicopter deck can be protected in different ways, by ensuring that only some types of helicopters are capable to land on the deck. There are also measures that can be done related to electronic security of a platform to detect early warning signs from shore. A strong physical security will remind people of the threats facing the installations and the organization. It will also give signals to potential intruders that the oil companies and their national force are prepared and aware of the threats facing their installations. The Norwegian preparedness system needs to learn from other countries and their preparedness system related to their physical protection and security culture.

The preparedness team are dependent on national resources to handle a terror threat situation. The constitution Article 99 in Norway states "*the military forces shall not be used against civilians, where a terrorist attack is an exception*". For the national resources to be used during a crisis situation, the ministry needs to give approval of this. This is a time consuming process where the police chief sends "a request for assistance" to the Ministry of Justice through the Police Directorate. During a potential terrorist attack military assistance is highly needed, immediately. Today this process takes too much time and lives can be lost due to how the system is designed. The time the ministries take to answer the request of assistants is one of the biggest weaknesses in today's national preparedness system. In the interview with the Police they stated that during last years Gemini exercises the response time for assistance was 33 hours, by that time the terrorists could do extreme damage both to people, installation and environment. The police are now working on simplifying this process. One of the efforts the police have implemented is that they notify the special force immediately, so they can use the time to prepare the necessary resources.

In areas lacking infrastructure there is higher demand of sharing resources and cooperating (Njå, 1998). The current legal framework that regulates the oil companies lacks strict

regulations and framework on how to cooperate and share resources. Even though the new "*principle of cooperation*" ensures better organization of social security and preparedness efforts, the principle doesn't emphasise in which areas there is a need for stronger cooperation and how the distribution of resources should take place.

Theory states that teams that are highly interactive will have a better precondition of developing shared mental models than teams that are not (Brun, 2003). The Norwegian Police have annual exercises with the military, police and the oil companies. The annual exercises switch between the four police districts with shelf responsibility, every year. The main oil and gas infrastructure is located in Rogaland Police district outside of Stavanger. This has resulted in exercises that happen more frequently in this area than other police districts. As a result some of the companies gets more practice than others due to their location. To strengthen the preparedness team during crisis situations in the Barents Sea more practice and exercises should be done in this region. By comparing all the exercises that has been conducted through the years in the Norwegian Sea, one also sees a need for increasing the number of exercises conducted in the Barents Sea. This will be important for the oil companies and the emergency response actors they work together during an emergency to be able to acquire knowledge about the area and the challenges related to preparedness.

Summary

The oil companies set stricter requirements internally, and see a higher risk threat picture then the authorities. The oil companies and their preparedness team need to collaborate with the authorities to set more realistic and common requirements in relation to combat terrorism. In general there is a need of stronger cooperation between the preparedness actors with a clearer responsibility distribution within the Norwegian preparedness system.

The Norwegian practice related to security is still on the preventing phase, and needs to learn from other countries that have experience in this field, and work towards security of the petroleum industry in a total different way. The Norwegian preparedness system needs to learn from other countries and their preparedness system related to their physical protection and security culture.

The request of assistance process needs to be simplified where it takes shorter time before a decision is made. During a potential terrorist attack military assistance is highly needed,

immediately. Today this process takes too much time and lives can be lost due to how the system is designed.

There is a lack of full-scale exercises in the Barents Sea, involving important actors such as the police, the military and external preparedness actors. To strengthen the preparedness team during crisis situations in the Barents Sea more practice and exercises should be done in this region. We also see a need for increasing the number of exercises conducted in the Barents Sea.

5.3 A complex and turbulent environment and the preparedness team

The preparedness respond time in the Barents Sea should be at least as good as on the rest of the NCS. Related to security of installations in the Barents Sea the preparedness system faces challenges related to resources and infrastructure. Long distance to shore, few vessels and helicopter in the area characterise the lack of some resources that are needed during a crisis situation (Petroleumtilsynet, 2013 (2)).The infrastructure in the Barents Sea is not built to transport the needed assistant and resources within a qualified timeframe, as the case of a terror attack on an installation.

Comparing the preparedness system in the Barents Sea and further south on the NCS, we see that there are several areas that oil companies meet great challenges related to preparedness during crisis situations. Bellow is an overview of those areas within the Barents Sea that are not meeting the preparedness standards to handle crisis situations in the Barents Sea.

Sea area on the NCS / Influential factors on the preparedness level	The Norwegian Sea and North Sea	The Barents Sea
1. Geographical area	Small	Large
2. Experience and knowledge	High	Low
3. Preparedness resources available	Many	Few
4. Oil companies preparedness system	Strong	Weak
5. Distances	Short	Long
6. Preparedness time	Inside recommended timeframe	Outside recommended timeframe

Figure 16 - Comparing the Norwegian Sea/North Sea with the Barents Sea

1. The Barents Sea stretches over a larger geographical area than the Norwegian Sea and North Sea. It is challenging to secure large geographical areas as the Barents Sea, where the distances for assistant and collaboration are highly spread in a complex and harsh environment.

2. The oil companies needs knowledge and experience to meet the challenges related to resources and lack of infrastructure during a terrorist attack in the Barents Sea region. The Barents Sea differs from part of Norway due to long distance to other regions and the national preparedness resources. The managerial roles within the preparedness team needs to strengthen their knowledge of the regions characteristics, vulnerabilities, capabilities, expertise, technology and operational management. Those who know the region are familiar with the lack of capacity and availability of resources, and can better respond to a crisis situation (Jacobsen, 2012).

3. There is a lack of emergency response resources in the area to handle a terrorist attack, compared to the rest of the NCS. Lack of infrastructure, logistic solutions and access to resources during a crisis situation on an oil installation in the Barents Sea can lead to tremendous consequences (Okstad, 2012). There are few available airports with proper capacity. These airports are important contributors to the flow of resources in the petroleum industry in the Barents Sea. There are no filling stations for helicopter in the Barents Sea, which is needed if the helicopters are going to operate over their limit, which will be the case in the northern parts of the Barents Sea (PTIL, 2014a). Few helicopter resources in the Barents Sea makes the oil and gas companies more dependent on vessels. But there are also a shortage of appropriately equipped vessels that may be called on for assistance during a terror attack (Ims, 2013). There will be struggles to rescue, transport and provide medical treatment to 80-140 people working on an offshore oil installation in the Barents Sea (Jacobsen, 2012). Many companies are now teaming up sharing resources, but there are challenges related to the long distances between the operators sharing resources and a limited number of emergency equipment if several attacks take place at once on different installations. There is a need for evaluation of the preparedness resources that are present in Barents Sea related to the increased activity and responsibility. This requires a strong collaboration and interaction between operators, authorities and local participants.

4. The petroleum industry has not established or planned to build a main 2nd preparedness team located in the Finnmark region that uses local expertise and knowledge on how to

handle terror threats and other crises in the Barents Sea. Today the oil companies have a support line located in the Finnmark region, while main 2nd preparedness team is located further south on the NCS. The 2nd line preparedness system spread over a larger geographical area where the preparedness team are not gathered in one location could cause collaboration and communication challenges. The preparedness system is already highly spread, with several actors and participants. Rather then establishing support lines we suggested that a full 2nd preparedness team is established in the Finnmark region that are able to handle crisis situations in the Barents Sea with support from the 2nd line further south.

5. In the Barents Sea there are long distances between shore and offshore, between the operating oil companies and their installations, and there are larger distances between preparedness participants in the Finnmark region. Getting from shore to the offshore installations is a much longer and difficult process than in the southern regions. The petroleum activities further south are located much closer where the distance to assistant each other during crises situations are much shorter than in the Barents Sea. There are also less standby vessels and supply vessels in the Barents Sea assisting during crisis situations comparing to areas that have a higher level of petroleum activities. Complex environments require interaction and dependency between participants. The participants are dependent on sharing resources and information to meet the challenges of the complex environment (Njå, 1998). Also the distances onshore are larger in the Finnmark region compared to the rest of Norway. Making the collaboration process between preparedness participants more challenging.

6. Response time is the time from the attack happens, until the forces are inserted. The respond time will depend on the distance to the accident site, the time it takes for the preparedness actors to be ready and how quickly they get notice from the oil companies (Ulriksen, 2013). In a crisis situation the response time is longer in the Barents Sea, compared to the rest of the NCS. This is mainly due to all the above-mentioned factors, making the process much more challenging than further south. Today there is a lack of awareness of how long this responds time is in the Barents Sea, since national resources used during a terrorist attack need to be approved before they can be used against civilians. There is a need for exercises to test the response time from national preparedness resources to reach oil installations in the Barents Sea in case of a terrorist attack.

Summary

We see a lack of evidence on how the oil companies are prepared to handle terror situations in the Barents Sea. The preparedness system and its teams are primarily based on the infrastructure and resources located further south on the NCS. There is a lack of knowledge and experience from the Barents Sea in terms of available resources and possibilities for improvement in the infrastructure. The managerial roles within the preparedness team needs to strengthen their knowledge of the regions characteristics, vulnerabilities, capabilities, expertise, technology and operational management

There is a need for more helicopter resources, airports to transport resources from and filling stations from helicopters. The lack of helicopter resources make the preparedness team more dependent on vessels in the Barents Sea, but there are also a need of appropriately equipped vessels that can assistance during a terror attack. The oil companies are teaming up to meet these challenges, but the resource allocation can be difficult if more actors are dependent on them at the same time. There is a need for stronger collaboration and interaction between operators, authorities and local participants to solve the challenges related resources in the Barents Sea.

There should be established a stronger 2nd preparedness team in the Finnmark region that have expertise and knowledge in how to handle crisis situations in the Barents Sea. Since the preparedness team are located further from the rest of the preparedness team they are dependent on a higher and more specialised competence.

To handle the challenges related to the Barents Sea region the oil company and other preparedness actors should collaborate on finding new solutions of safeguarding their offshore installations.

5.4 Terror threats and different types of terrorist and the preparedness team

Oil and gas installations in the Barents Sea are potential terrorism threat goals, due to their economical importance and international relations. Norwegian oil companies have little experience with terror attacks and may have difficulties in understanding the risk related to these threats due to its remoteness. The terror attack In Amenas and the 22nd of July at Utøya have made oil and gas companies realize that terrorism can happen to their facilities in Norway. Even though Norway is a low risk country related to terrorism, the petroleum industry needs to prepare for the worst.

The petroleum companies have done improvements in their preparedness management system, recruiting more employees with security experience and competence from the police, military etc. In addition new common security organizational systems and frameworks are established. Some oil and gas companies have taken this further by applying their own terror threat assessments and collecting information from external actors in addition to the annual threat assessment from PST. The oil and gas companies have mainly done changes related to single events that have shown weaknesses within their existing security system (Brusdal, Statoil, 2014). Terrorism is political, economical and socially motivated, where attacks are performed in various ways with different methods, intentions and goals (Bråten 2013). It seems like PST and the oil and gas companies emphasize different influential factors assessing the terror threat picture. It is difficult for the oil companies to predict how the terror threat picture will change over time. Single events are an important influential factor for the oil and gas companies. Both events indirectly and directly influencing the organization or the industry are important factors when preparing for terror threats and strengthening their preparedness system. The PST does not focus on single events, but rather look at general trends as the main factor forming the terror threat picture. These differences may be reason enough for oil companies to evaluate the assessment done by PST, as not being good enough for covering the terror threats against the petroleum industry and their installations.

There are also disagreements between the Ministry of Petroleum and energy (OED) and the oil and gas companies related to the importance of protecting petroleum installations against terror threats (Helgesen, 2013). These different terror threat evaluations also give another reason for oil and gas companies to do their own terror threat assessments. In addition it will be difficult to have a trustworthy relationship creating good collaboration, when the authorities and the oil companies disagree at a high level. A possibility would be to include

managers of the preparedness team to take part in common terror threat evaluations with PST. The oil and gas companies have valuable experience and knowledge about the influences of single events on their preparedness systems. They are capable of describing weaknesses within their own preparedness system, which could be simple terror targets.

There are constantly changing factors influencing the risk level of the threat situation. The preparedness team needs to be updated on these changes to create realistic scenarios to exercise on (Johansen, 1994)**.** These development trends are provided through PSTs terror threat assessments. PST does not assess threats related to specific sectors or actors. It would be an option for PST and the oil and companies to collaborate on assessing the terror threats against petroleum installations. On the other hand PST provides the petroleum sector and its actors with security consulting where they help oil and gas companies to secure them against specific terror challenges and condition within the sector. This collaboration would increase the security awareness within the oil companies and increase their competence related to terror threats. The preparedness team needs to have the right knowledge and capacity to take the right decisions (Aarset, 2014a). The increased awareness and knowledge within the organization will also increase the terror threat expertise within the preparedness team.

The ability to handle a terrorist attack depends on the response time (Ulriksen, 2013). Terror attacks have taken form in many ways, a trend that is increasing shown in the coordinated multiple raids of attacks. For the preparedness team to be prepared for attacks like these they need to efficiently reallocate their available security forces. In addition there are limited resources that force the preparedness team under in a stressful situation to allocate their resources between the attacked installations. The Barents Sea already lacks necessary resources related to preparedness and the preparedness team will struggle to assist several attacks with its resources. In addition the Barents Sea is an area expecting longer response time due to its distances and harsh environment. Terrorists tend to coordinate multiple raids of attacks, where the diversionary attack is designed to divert the attention of the larger attack. The preparedness management will then use longer time to respond and the terrorists will get the chance to do even more harm (Wu, 2009). If multiple raids of attacks take place, where the terrorists hit either both onshore and offshore facilitation, or they attack two installations at the same place it will create even more time lag. This makes the terrorists capable of doing even more harm and increases their chances of succeeding with their terror goals.

Practice of different terror scenarios are a key element to maintain a high security level (Parfomak, 2007). The practice of terror threat scenarios held by the petroleum companies is prioritized on the same level as other DSHA scenarios. There are 17 DSHA, where new exercises are held every 14th day. It would be difficult to cover different terror threats and terrorists within this framework. For the petroleum companies and their preparedness team to be prepared for terror threats they need to practice on several more terror threat scenarios. The data collection shows that the challenges related to a terrorist attack in complex environments require more practice and experience than other DSHA. Some petroleum companies have chosen to exclude the threat of terror in their strategy mainly due to its unpredictability. It is also argued that since the Police have the overall responsibility during a terror situation, they are the ones with the strategic plans on how to solve the terror threat situation. It is important that the preparedness team is prepared and able to handle the situation until the police have reached the installation. Related to terror and the Barents Sea this process takes longer time than in other situations, dependent on the distance from the installations to the national resources and their ability to reach the accident place.

These terror threat scenarios are also based on the terrorists' probability and capacity. Those actors with the highest probability and capacity poses the greatest threat (Johansen, 1994). Since the terror threat situation is constantly changing and is highly complex due to its many influential factors, it might be wrong to focus more on those scenarios with a higher probability and capacity, since these can quickly change and where new scenarios can expose a bigger threats than those first expected. Petroleum companies need to be prepared for the unexpected and by prioritizing exercise both those scenarios that are more likely and less likely to take place.

It is important that the preparedness team understands patterns of behaviour and evaluates forthcoming patterns of different terrorists. Combs suggests (2013) that different terrorists can be divided into three categories: crusaders, craziest and criminals. For the preparedness team to take the right decisions dealing with terrorists they need to have information and knowledge about who the terrorists are. As mentioned the petroleum companies work on identifying terrorists based on their intentions and capacity to evaluate what types of attacks they are capable of performing. In addition it would be relevant to know their level of negotiation willingness and their expectation of survival. A manager also function as a negotiator which is an integrated part throughout the whole managerial work process

(Mintzberg, 1989). Even though the police are the one negotiating with the terrorists, it is important that the managers within the preparedness team are familiar with the terrorists' willingness to compromise or if their goal is to do as much harm as possible with the willingness to die. This will give them a better understanding of the situation and what type of terrorists they are facing. Not always is the terrorist's intention, goals and motives clear, where the terrorist is seen as emotional and physiological unstable. Here it will be difficult for the preparedness team to handle the situation if they have no practice or experience dealing with psychologically unstable terrorists acting unpredictable both in terms of goals and actions.

Greenpeace has several times through peaceful demonstrations shown how easy it is to enter oil and gas installations. Now that oil and gas companies are moving further north on the NCS, with a more vulnerable environment, the activity level from environmental activists might increase. Activists might approach installations with different, new strategies of obtaining publicity to promote their environmental goals. Today environmental activists such as Greenpeace do not expose a threat, due to their peaceful demonstrations. They do not have intentions to harm people or installations, where they often only seek publicity, while a terrorist has an aim to create fear, harm people and installations. Oil and gas companies operating in the Norwegian Barents Sea does not see activists as a threat against their people and installations. So far the petroleum companies have handled the situations peacefully and discretely. However Norwegian oil companies have been naïve related to the terror threats facing their installations, and this can be reflected through how they handle activists. Comparing Norway and Russia related to how they handle environmental activists shows large differences. Where Russians operating in the Russian Barents Sea sees the demonstrations from activists as a threat to their installations and people. In the future there might be common installation and infrastructure stretching between the Norwegian and Russia border in the Barents Sea. There might be activists wishing to harm Russian petroleum activity attacking common installations and infrastructure. It also might be activists who seek to carry through peaceful demonstrations that unintentionally cause harm to the installation and people. Russia's aggressively approach to handling activists might cause physical harm of the activists, where activists might be provoked to act aggressive back.

Related to the physical security of the installations, they should be protected against activists, not because activists intentionally seek to harm anyone, but because there might occur

unintentional accidents and damages. Demonstrating how easy it is to enter installations can give inspiration to people who seek to harm people and the installations. A strong physical protection of the installations will protect the installation against all types of intruders, regardless of what their intentions are. The petroleum companies are able to still have a peaceful approach dealing with the activists, only now it will be more difficult for them to enter their installations. Below is a suggestion of those actors petroleum companies need to protect their installations against:

	Motive/Goal	Willing to Negotiate?	How to handle the actors
Crusader	Blend of religious and political causes	Seldom, betraying then a higher cause	Full emergency response
Criminal	Personal gain	Usually, in return for profit	Full emergency response
Crazy	Clear only to the terrorist	Possible, only if the terrorist understands the cause	Full emergency response
Activist	Environmental causes	Highly possible, if the activist gets their cause proven	Handle in a peaceful manner, guiding them away from the installation

Figure 17 - Actors petroleum companies need to protect their installations against

The best way to improve security in an organization is to change the organizational culture (NOU, 2000:24). The organizational culture will have a great influence on how organization handle crisis situations (Bråten, 2013). The organizational culture is related to how the members of the preparedness team thinks and their attitudes, which will affect their way to react during a crisis situation. It is easier for people to understand, see early warning signs and solve a situation if they share the same understanding of the threat. The Norwegian culture is

presently naive in terms of realizing the potential threat of terror against the nation and its people. Oil and gas companies state that it would be difficult for terrorists to reach installations in the Barents Sea and see it as unlikely that terrorists would attack installations in such harsh environments. These attitudes will affect and influence the rest of the organizations security culture. The lack of awareness of potential threats makes personnel and other actors less conscious in the way they act in everyday situations. Statoil states that security is everyone's responsibility and to improve the security there needs to be a change within the organizational culture. Oil and gas companies have built a strong safety culture within their organizations, while the importance of security has been left out and not prioritized on the same level (Jerre, DNV-GL, 2014). The terror attacks of the 22nd of July and In Amenas they have increased the awareness of terror attacks and identified that that the security within the petroleum companies needs to be strengthened. There are several steps and areas that need to improve to lift the overall security culture within the organization. To take this decision the manger needs to know all possible alternatives, the consequences of each alternative, be prepared for these consequences and compare the consequences and to determine which one to choose (Turpin, 2004). One way of increasing the security awareness is to employ a managerial role with security expertise within the preparedness team. Today there are no roles within the preparedness team that are specialized in security. There are specific roles focusing on safety such as environmental issues as oil spills. A similar role within security and terror attacks should be established within the team.

Summary

The assessments done by the PST are good enough to cover the terror threats against the petroleum industry. There is a need for more internal assessment within the companies, more cooperation with PST and also look at the possibility to hire more external actors with experience in the field.

There are disagreements and differences in how the petroleum companies, PST and OED consider the terror threat against petroleum installations and which influential factors that are emphasized the most. A better collaboration between these actors is needed to build a strong security culture, and it is necessary with good training and exercises on potential terror threat scenarios.

It is important that the preparedness team is prepared and able to handle the situation until the police have reached the installation. For the petroleum companies and their preparedness team to be prepared for terror threats they need to practice on several more terror threat scenarios. Petroleum companies also need to be prepared for the unexpected and by prioritizing exercise both those scenarios that are more likely and less likely to take place.

The oil installations should be physical secured to protected against activists, not because activists intentionally seek to harm anyone, but because there might occur unintentional accidents and damages. A strong physical protection of the installations will protect the installation against all types of intruders, regardless of what their intentions are.

There is a need for a change in the organizational culture due to terrorism. The lack of awareness of potential threats makes personnel and other actors less conscious in the way they act in everyday situations. There are several steps and areas that need to improve to lift the overall security culture within the organization. One way of increasing the security awareness is to employ a managerial with security expertise within the preparedness team.

6.0 Conclusion

Oil and gas installations in the Barents Sea are potential terror threat goals due to their economical, national and international importance. These installations should therefore be protected through a strong security and preparedness system. The petroleum companies, their 2nd line preparedness team and the national preparedness system should be structured and organized in new ways to meet the threat of terror in the Barents Sea. In this study we have examined how four different variables influence the oil company and their 2nd line preparedness team ability to prepare for terror threats in the Barents Sea. The study concludes that changes should be done internally within the oil companies and their 2nd line preparedness team, and externally within the national preparedness system to strengthen the preparedness system.

For oil companies to be prepared for terror threat in the Barents Sea they should strengthen their 2nd line preparedness team in the Finnmark region assisting the 1st line preparedness team for oil installations in the Barents Sea. Some oil companies have already established these procedures while others plan to establish a 2nd line preparedness team in the Finnmark region, functioning as a supportive line to the main 2nd line located in either Stavanger or Bergen. This 2nd line preparedness should include more roles covering expertise and knowledge within terrorism and local knowledge about the Barents Sea. Having a managerial role within the 2nd preparedness line who is specialised in how to handle different terrorists and terror attacks will strengthen the teams ability to make good decisions that assist the 1st line. This expertise covers knowledge about different terrorists, attack methods, capacity and probability, their desire to negotiate and survive and what solutions that is suited to handle these different scenarios.

Increased competence and expertise within terrorism and the Barents region will give the 2nd line preparedness team more responsibility areas during a crisis situation. To be able to assist the 1st line in the best possible way, the focus within the 2nd preparedness team should be mainly on what happens out on the platforms. It would therefore be recommended that some of the preparedness roles that mainly assist procedures onshore could be outsourced. We here refer to next-of-kin and media services that compromise the communication with the public. This outsourcing should not be on the expenses of the organizations reputation and credibility, and this might not be the optimal solution related to other regions and crisis situations.

Internally the preparedness teams practice and train each 14th day on potential crisis situations. Including both individually and common exercises between the preparedness teams. Preparing for terror threats in the Barents Sea consist of a much more comprehensive collaboration process, with several more actors sharing information and resources within a larger geographical area. Preparing for these crisis situations the preparedness teams need to perform more full-scale exercises in the Barents Sea. This includes practices with all potential participants during a terror attack, such as the military, local actors such as the coast guard, standby vessels, helicopter services and rescue coordination centres. Since there is a lack of emergency equipment such as helicopters and standby vessels designed to handle terror threats, the oil companies should practice on resource allocation and coordination when they are exposed to terror threats. If possible, the petroleum companies should also participate in terror exercises held by other international petroleum industries that are highly exposed and experienced on terror threats such as UK and USA. The petroleum companies should invite international forces, such as police and military, that can contribute with valuable assessments of the full-scale exercises in the Barents Sea.

The full-scale exercises should practice on different terrorists attacks, methods and strategies. Both where the terrorists attack and approach the installations by boat and helicopter. There should be exercises related to internal terrorists as unfaithful personnel or cooperation partners, and external terrorists outside the petroleum industry. Different exercises must be performed related to the terrorist's different goals, motivations and negotiation willingness. Also the oil company needs to test their capacity to handle different types of terrorist's attacks, including the ability to respond to simultaneous terror attacks performed by the same terrorists.

After the 22nd of July and the In Amenas terror attacks, the oil companies have lifted their physical security of their onshore facilities such as refineries, Snøhvit LNG plant and petroleum offices. The petroleum companies have invested largely in satellite systems monitoring the area. These monitoring systems are able to capture intruders, such as terrorists, approaching the installations. This gives the petroleum companies the opportunity to respond quickly to the crisis situation. Further north in the Barents Sea the satellite capacity is weak and needs to be improved. Related to other physical security measures of oil installations such as armed forces and fences, they have not reached the same level as those areas mentioned above. Petroleum companies should increase their physical security of oil and gas

installations by having armed forces protecting the installations, physical barriers such as fences to hinder potential threats and intruders from boarding and harming the installations and the personnel. Increased physical security will reduce the capacity and probability for terrorists succeeding with their attacks as the installations would become less attractive terror goal. If terrorists despite this decide to attack the installation, there would be difficulties of doing the same harm within the same timeframe due to the physical armed forces and fences. This gives the preparedness system more time to handle the crisis situation. In addition the physical security would make it impossible for peaceful environmental activists to board the platform.

For the oil companies to implement these suggested physical securities, the authorities needs to share the same view of what physical securities should be in place to prevent and prepare terror attacks. This is related to how the threat picture is perceived and understood by the oil companies and the authorities. Today the petroleum companies set stricter requirements related to some areas within security than the authorities. It is suggested that they work towards a shared risk threat picture.

When opening new petroleum activities in the Barents Sea the oil companies should conduct new assessments related to the terror threat level in the region. Moving further north in the Barents Sea the petroleum companies needs to be aware of new threats such as activists approaching more aggressively. In addition these new installations will be nearer to boarders to other countries introducing new risks related to new enemies.

The petroleum companies needs to increase the preparedness resources in the Barents Sea. This includes helicopter, filling stations, airports, crisis equipped vessels. These resources needs to be located closer to the installations in terms of reaching the attacked installation within a representative time, to save lives and prevent damages.

6.1 Further recommendations

This thesis addresses the preparedness challenges in the Barents Sea where we focus on terrorism preparedness. There are areas we mention in this study that provide the basis for more exploration.

There are different phases of preparedness, where we focus on the prevention and preparing phase of terrorist attacks in the Barents Sea. Another area that provides a basis for further research is how early the oil companies can discover the potential attacks. This would be related to technical measures from the companies in terms of physical security and also related to monitoring.

The response time the police and the national preparedness actors use to reach offshore installations in the area is a big challenge. There is a need for new assessments of how "the request for assistance" system can be more effective. Some improvements have been made in this area, but we see the need for new assessment when oil activities are moving even further north.

The further north within the Barents Sea and Arctic region the more challenging it becomes for the petroleum industry to have the necessary preparedness resources available and should be allocated. There is a need for more research on how the local resources and local actors can contribute and assist the oil companies with resources during crisis situations in the Barents Sea. Another important area is to look at how the Coast Guard can assist the oil companies in areas where they lack equipment and vessels to handle crisis situations.

We see today an increased development in the factors that influence the terror threat picture in Norway related to offshore installations. There is a need for more evaluation related to how the strategic choices the oil companies' take may affect their exposure to potential terrorist attacks. It will also be necessary for the oil companies and other industries to evaluate which potential factors, such as collaboration with new countries, can affect the terror threat level in Norway in the future.

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8.0 Appendix

Appendix 1 – Interview with the oil companies

Vi studerer siste året "Energy Management" og skriver for tiden masteroppgave innen for olje og gass sektoren. Vi har valgt å fokuser på lederrollene som kreves i beredskapsorganisasjonen ved et eventuelt terroraksjon på plattformer i Barentshavet.
Vi ønsker også å se på utfordringene ved den økte aktiviteten i Barentshavet og da spesielt knyttet mot at selskaper går stadig lengre nord. Vi vil undersøke hvordan den endringer i trusselbildet og krav fra myndighetene påvirker hvordan oljeselskapene tilrettelegger for sin beredskapsorganisasjon.
Først av alt lurer vi på om vi kan ta opp intervjuet for bruk i vår oppgave, og om vi da kan henvise til deg i teksten. Vi sender da over teksten til godkjenning før noe blir publisert, og hvis du har eventuelle spørsmål må du bare ta kontakt.

Om deltakeren

1. **Kan du gi en kort presentasjon av deg seg?** (Bakgrunn, arbeidsoppgaver i bedriften, tidligere erfaringer, etc.)

Beredskap

2. **Hvordan er oppbyggingen av kriseberedskapsorganisasjonen (tegne figur)**
    - 1 linje beredskap - På oljeplattformen
    - 2 linje beredskap - Den regionale beredskapsorganisasjon, for eksempel Hammerfest
    - 3 linje beredskap - Ved hovedkvarteret i Norge

3. **Hva er oljeselskapene sine oppgaver under en krisesituasjon på en av deres plattformer på den norske sokkel?**
    - Hvem er det som varsler dere?
    - Hvordan ser selve hierarkiet ut under en terroraksjon i forhold til andre krisesituasjoner?

4. **Hvordan jobber kriseteamet med andre aktører internt og eksternt før en krisesituasjon?**
    - Hvordan ser samarbeidet ut under en krisesituasjon?

Ledelsesroller

5. **Hvordan forandrer roller og struktur av rollene seg fra før en krise tar sted til selve krisen inntreffer?**

6. **Hvem inngår i et kriseteam på en oljeplattform offshore?**
    - Hvor mange personer utgjør et kriseteam?
    - Hva er de forskjellige rollene?
    - Hvordan utfyller rollene hverandre?

7. **Hva kreves av kompetanse og personlige egenskaper for de som inngår i et ledelsesteam under en krisesituasjon?**

- Hvilke kompetanse og kapasitet kreves for å forhindre en krisesituasjon?

Barents Havet

8. **Mener du oljeselskapene har det som skal til for å operere sikkert i Barents Havet?**
    - Vil det være noen utfordringer du ser på som større enn andre i Barnets Havet?
    - Hvilke utfordringer ser dere i utvikling av beredskapssystemer tilpasset for Arktiske operasjoner?

Øvelser

9. **Hvordan og hvem velger ut scenarios for øvelsene og treningene?**
    - Når dere velger ut scenarios, hvordan prioriterer dere tidligere kriser og angrep i forhold til framtidige angrep og kriser som kan ta sted?

10. **Hvordan vurderer dere øvelsene som er gjennomført og hvordan gjør dere eventuelle endringer/forbedringer?**

11. **Hvilke øvelser har det vært knyttet mot krisesituasjoner og tilsiktede hendelser på norsk sokkel?**
    - Øver dere på krisesituasjoner med ansatte på plattformer?
    - Skjer denne øvingen med kun dere som organisasjon eller som samarbeid mellom flere aktører?
    - Har du noen oversikt over hvilke øvelser skal dere gjennomføre i 2014 og 2015 knyttet opp mot denne problemstillingen?

Terror

12. **Hva er de svake og sterke sidene av dagens beredskapssystemer relatert til oljeplattformer?**
    - Vil disse beredskapssystemene møte nye utfordringer når petroleumsaktiviteten flyttes stadig lengre nord?
    - Hvilke områder må dere omstille dere på/endre for å møte utfordringene i Barentshavet kontra lengre sør?

13. **Hvordan vurderer dere trusselbildet når det gjelder faren for terror på norsk sokkel?**
    - Tror du dette vil endre seg fremover?
    - Er det spesielle områder dere fokuserer mer på?
    - Er det noen terrorangrep eller terrorister dere ser på som en større trussel enn andre?
14. **Hvordan blir terrorangrep prioritert i forhold til andre DFU med tanke på forebygging og forberedelse av ett potensielt angrep?**
15. **Hvordan vurderer og tilrettelegger dere for forskjellige type terrorangrep og terrorister i øvelsene og treningen?**
16. **Hvordan arbeider dere daglig for å forhindre eventuelle terrorangrep på oljeplattformer?**

Annet

17. **Hvilke rapporter og analyser tenker du kan være viktig for vår oppgave å se på?**
18. **Hvem vil du anbefale oss å snakke med når det gjelder andre ressurspersoner?**

Appendix 2 – Interview with external actors and the authority

Intro samme som intervju med oljeselskapene
Om deltakeren

1. **Kan du gi en kort presentasjon av deg seg?** (Bakgrunn, arbeidsoppgaver i bedriften, tidligere erfaringer, etc.)

Samarbeid og koordinasjon

2. **Hvordan samarbeider myndigheten med oljeselskaper på norsk sokkel?**
    - Hvordan kommuniserer dere?
    - Hvordan ser erfaring og kunnskapsdelingen ut?
    - Hvordan følger dere opp oljeselskapene når det gjelder beredskapsorganisasjon?

3. **Har dere en felles arena hvor dere utveksler informasjon og data med petroleumsselskapene?**

4. **Hvordan arbeider dere for å utarbeide rammeverkene for hvordan krisesituasjoner på plattformer skal forhindres og håndteres?**

5. **Hvilken tiltak har blitt endret innen HMS og beredskap etter hendelser som 22 Juli og In Amenas?**

Barentshavet

6. **Hvordan setter dere krav til selskaper som opererer i Barentshavet kontra andre områder på den norsk sokkelen?**
    - Hvor mye tar dere hensyn til oljeselskapenes forslag til eventuelle endringer?

7. **Hvordan møter dere utfordringene knyttet til økt aktivitet stadig lengre nord i Barentshavet, med tanke på infrastruktur, kommunikasjon, avstand til land og annet?**

8. **Hvordan har risikonivået i norsk petroleumsvirksomhet utviklet seg de siste årene?**

- Hvordan beregner dere dette risikonivået?
- Hva har størst påvirkning på at risikonivået endres?

9. Mener du at oljeselskapene har det som skal på plass for å operere sikkert i Barentshavet?

Terror

10. **Hvordan vurderer dere trusselbildet fremover i forhold til terror på oljeplattformer?**

11. **Hvordan vurderer og tilrettelegger dere for forskjellige type terrorangrep og terrorister; hvor terroristenes mål, kapasitet og metoder kan variere?**

12. **Hvilke krav stiller dere til plattformsjefer og personer som er en del av kriseteamet offshore i Norge?**

13. **Hvordan øves det på terror på norsk sokkel? Hvem deltar?**

14. **Hvilke andre offentlige myndigheter samarbeider en med i forhold til terror bekjempelse?**

Annet

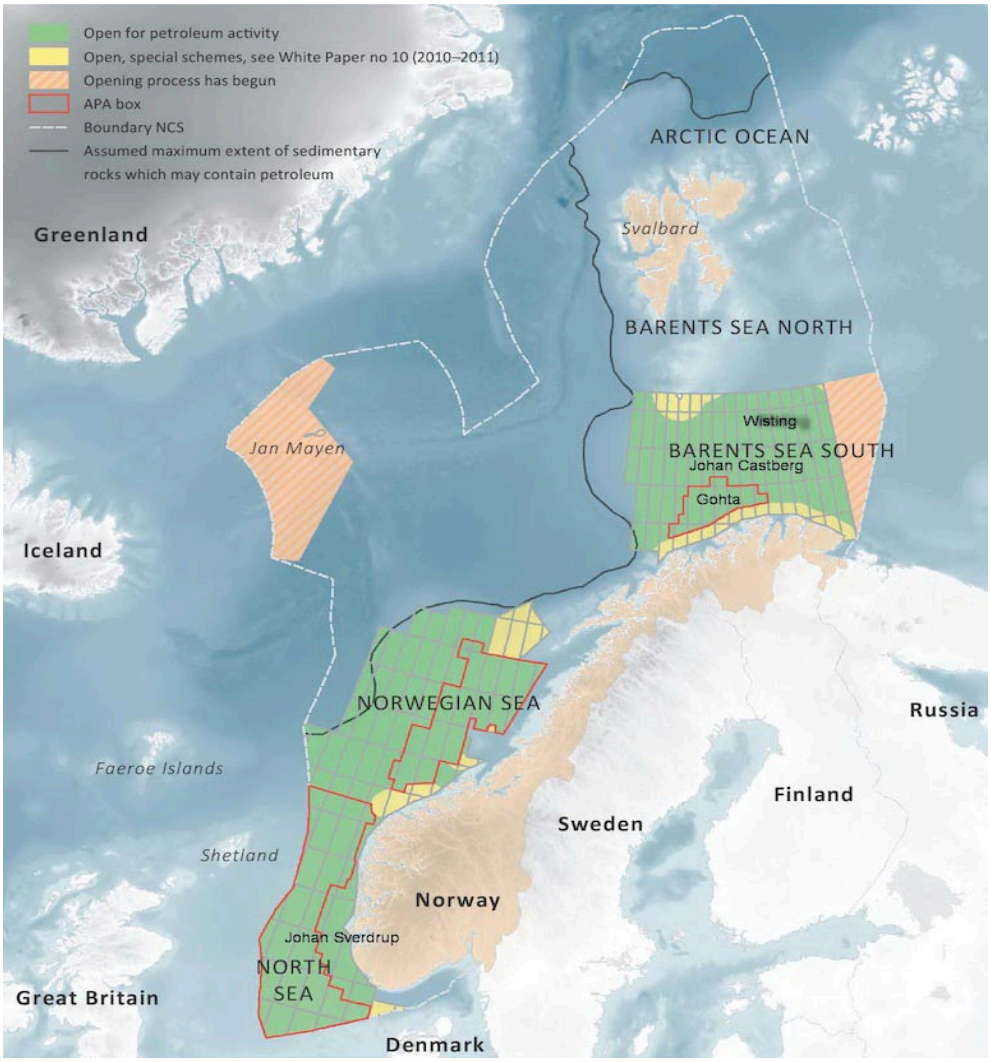
15. **Hvilke rapporter og analyser ser dere som viktig at vi studerer?**

16. **Hvem vil du anbefale oss å snakke med når det gjelder andre ressurspersoner?**

Appendix 3 – Interview participants

Name	Position	Company	Place	Interview type	Date	Time
Per Jacob Solhaug	Ass. Cheif of Police	Police liaison Officer to the Norwegian Joint headquarters	Bodø	Face-to-face	18.02.14	13.00-14.00
Liv Nielsen	HSEQ Manager	ENI Norge	Bodø	Face-to-face	20.02.14	16.30-17.15
Lill Harriet Brusdal	Manager safety and sustainability	Statoil	Bodø	Face-to-face	19.03.14	12.30-13.30
Anthoni Larsen	Senior advisor	PSA (Ptil)	Stavanger	Face-to-face	25.03.14	11.30-12.30
Ellen Waldeland	HSEQ Advisor	ENI Norge	Stavanger	Face-to-face	25.03.14	14.00-15.30
Gunn Stabell	Team leader safety and sustainability	Statoil	Bodø	Phone	27.03.14	10.00-11.00
Jon Jerre	Associate Director Oil and Gas Sector	DNV-GL	Høvik	Face-to-face	10.04.14	14.00-15.30
Kurt Andreas Skog	Senior Advisor	ACONA	Stavanger	Face-to-face	11.04.14	10.00-11.30
Participant 1&2		Statoil		Face-to-face	11.04.14	14.00-15.30

Appendix 4 – Map of the Barents Sea, Norwegian Sea and North Sea



[1] http://www.npd.no/Global/Norsk/4-Kart/Sokkelkart2013/Sokkelkartet-2013.pdf